



RESEARCH ARTICLE

MANUAL THERAPY IN ROUNDED SHOULDER POSTURE: A SCOPING REVIEW

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ABSTRACT

Background: Rounded shoulder posture (RSP) is a common postural impairment characterized by increased thoracic kyphosis and forward shoulder displacement. Manual therapy has been increasingly used as an intervention to correct rounded shoulder posture; however, the scope, type, and effectiveness of these interventions remain unclear. This study aimed to provide evidence-based insights into the effectiveness of manual therapy for rounded shoulder posture and to identify research gaps for future investigation. **Methodology:** A systematic search was conducted on PubMed, Google Scholar, PEDro, EBSCO, Web of Science, and Scopus, covering the period from 2015 to 2025. A total of 898 articles were reviewed and screened based on the predefined inclusion criteria. Ten articles were included in this review. The primary findings were classified into categories such as intervention protocols, outcome measures utilized, targeted muscle, and conclusions drawn by the respective studies. **Results:** The study found a variety of manual treatment approaches employed to correct rounded shoulder posture. Although the available data are variable and lack highly qualified research to prove effectiveness and direct therapeutic practice, more research using established procedures is required. **Conclusion:** Manual therapy shows potential benefits, but the variability in protocols and assessment approaches limits definitive conclusions.

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INTRODUCTION

Rounded shoulder posture (RSP) is a common postural deviation characterized by the anterior displacement of the acromion in relation to the body's line of gravity when observed in the sagittal plane. Usually brought on by the pectoralis minor muscular shortening, it is linked to protraction, downward rotation, and anterior tilting of the scapulae.(1) When maintained for extended periods of time, this maladaptive posture can cause soft tissue dysfunction and musculoskeletal discomfort (2). Prevalence rates of 73% on the right side and 66% on the left, epidemiological statistics indicate that forward shoulder position is quite prevalent among asymptomatic people between the ages of 20 and 50.(3) Rounded shoulder posture has been found to be a risk factor for shoulder dysfunction and upper quarter discomfort. Rounded shoulder posture has a complex etiology that includes Pectoralis minor muscular tightness, which can result from weakening in the middle and lower trapezius muscles and reduced scapular posterior tilt, retraction, and upward rotation during arm lifting (4). Round shoulders are associated with weakness in the middle and lower trapezius muscles and tightness in the serratus anterior, pectoralis minor, pectoralis major, and upper trapezius muscles (5).

The middle and lower trapezius muscles are especially susceptible and will cause a rounded shoulder posture, in contrast to the serratus anterior, pectoralis minor, pectoralis major, and upper trapezius muscles.(6) Additionally, rounded shoulder posture results in an imbalance caused by weakness from stretching the middle and lower trapezius, which leads to tightness and weakness in the pectoralis minor and pectoralis major, increased tension in the levator scapulae and upper trapezius, and dysfunction of the glenohumeral joint (5). The assessment of RSP has been conducted through various techniques including two- and three-dimensional motion analysis, radiographic imaging(4), and clinical tools such as the pectoralis minor length test/ table to acromion tests(7), pectoralis minor muscle test(8), scapular index, pectoralis minor index(9), wall-to-acromion distance(2), and forward shoulder angle using photogrammetry (10). Despite these advances, a reliable and easily applicable clinical assessment method remains a necessity for physiotherapists and clinicians (4). Another kind of conservative treatment is manual therapy (MT), which is provided by physical therapists, chiropractors, osteopathic physicians, and sometimes other medical experts. It was defined as any skilled, hands-on intervention performed by a therapist aimed at modulating pain, improving joint mobility, or influencing soft tissue extensibility.

Manual therapy can be used as an effective modulator to alter muscle function and ease pain, improve range of motion (ROM) and maintain integrity of soft tissue in musculoskeletal issues.(10) Stretching the shortened anterior musculature, particularly the pectoralis minor, and strengthening the weaker posterior stabilizers, such as the lower trapezius and serratus anterior, are the main goals of interventions for Rounded shoulder posture (11).

Manual therapy has become a popular strategy for regaining joint mobility, muscle length, and postural alignment.(12) However, the diversity of techniques and protocols used in clinical and research settings calls for a comprehensive mapping of the current evidence.

Purpose: This scoping review highlights that various manual therapy techniques, especially those targeting the pectoralis minor muscles and the use of a combination of stretching and strengthening exercises, can improve rounded shoulder posture. However, standard protocols and high-quality evidence are limited, suggesting the need for more rigorous future research.

Objective: The aim of this study is to explore and map the existing literature on the use of manual therapy interventions for the management of rounded shoulder posture, with specific focus on the targeted muscles, types of manual therapy techniques applied, and the outcome measures used to assess rounded shoulder posture.

Research Question

- Is there a standardized protocol for manual therapy techniques used in the correction of rounded shoulder posture?
- What outcome measures are used to assess rounded shoulder posture in clinical and research settings?
- Which muscles are most frequently targeted in manual therapy interventions for the correction of rounded shoulder posture?

METHODS

The Arksey and O'Malley scoping review methodology framework(13) and further guided by the Joanna Briggs Institute recommendations using the PCC (Population, Concept, Context) framework, as well as the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for scoping reviews (PRISMA-ScR) guidelines, were employed for the reporting of scoping review in this study. The protocol was registered with the Open science framework (OSF). Registration DOI 10.17605/OSF.IO/KZ7BC

Identifying Relevant Studies: To identify relevant studies, we formulated a search strategy and conducted searches in the electronic databases PEDro, EBSCO, Google Scholar, Web of Science, PubMed, and Scopus. We used keywords such as "rounded shoulder posture," "manual therapy," "muscle energy technique," "cupping," "forward shoulder posture," "forward shoulder angle," "table top test," "needling," and "k taping." The search was limited to articles published between 2015 and 2025.

Search strategy

Study Selection

- For the study selection process, the inclusion criteria was,
- Articles published in the English language between year 2015-2025
- Study participants as rounded shoulder posture
- Intervention as manual therapy (defined as Manual therapy was defined as any skilled, hands-on intervention performed by a therapist aimed at modulating pain, improving joint mobility, or influencing soft tissue extensibility.) (10)
- Outcomes studied for rounded shoulder posture
- Full-text articles of randomized controlled trials, experimental study, observational study, pilot study, case reports, interventional studies, comparative study

One independent reviewer conducted an initial screening based on the titles and abstracts of the records. After removing duplicates, the full texts of the selected articles were read. Any conflicts in the screening and study selection processes were resolved by a second reviewer. The data was managed using the Microsoft Word and Excel (Microsoft Corporation, Redmond, Washington, United States)

Charting the Data: Data from the articles were extracted independently by two reviewers using a standardized data extraction form developed for this review, including the author, year of publication, muscle targeted, sample size, intervention received by the control and experimental groups, intervention duration, outcome measures, and study conclusions.

Collating, Summarizing, and Reporting the Results: After discussing and interpreting the data, the final results were summarized into several categories. The results were reported in subcategories based on the targeted muscle, whether the manual therapy implemented had a standard protocol or common elements, and the outcome measures.

RESULTS

A total of 898 articles were obtained from the databases of which 165 duplicate articles were eliminated. The title and abstract of 733 articles were assessed. After the initial assessment, 706 articles were excluded. Based on the inclusion criteria, 10 full-text articles were read and included in the review. The process of selecting studies for the review paper is presented in Figure 1, using the PRISMA-ScR flow diagram.

Outcome measure: The reviewed studies employed various outcome measures to evaluate the efficacy of manual therapy interventions for rounded shoulder posture (RSP). Common tools included the pectoralis minor length test with ICC of 0.93(2,5,14–18), acromion-to-table distance with ICC of 0.90(16,17,16–19) forward shoulder angle with ICC of 0.85(18) using various software, and wall-to-acromion distance using 12 inch double square with ICC of 0.85(2, 15, 17, 22). All outcome measures have good to excellent reliability. These quantitative measures suggest that postural alignment may improve in individuals with a rounded shoulder posture following intervention, while primarily reflecting the sensitivity and consistency of the outcome measures used.

Muscle targeted: Most studies targeted the pectoralis minor muscle (2,14,15,18,20) because of its critical role in anterior

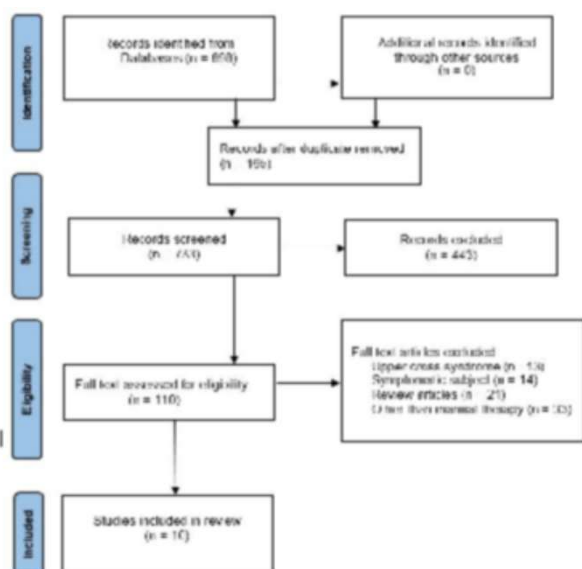


Figure 1. PRISMA- ScR flow diagram of the study selection process

tilting and protraction of the scapula, which contributes to the rounded shoulder posture. Other frequently targeted muscles include the upper and lower trapezius(5,16,21), rhomboids(3,18), and levator scapulae, to facilitate scapular stabilization and realignment. This muscular approach reflects the multifaceted nature of RSP and the need for a comprehensive intervention targeting multiple muscles (10)

Protocol and common elements: The interventions across studies displayed variability, although many included common elements such as manual elongation techniques like positional release technique(20) and stretching techniques(3,19), scapular mobilization(18), and muscle-specific techniques like Muscle energy technique(2,14,15,20). Mahadik et al. Compared the effect of positional release technique and muscle energy technique targeting pectoralis minor muscle concluded muscle energy technique is superior to improve RSP than positional release technique(19). While protocols were often tailored to individual needs, the lack of a unified, standardized manual therapy approach was evident, indicating a need for consensus on optimal intervention strategies for RSP. The study characteristics for the 10 included studies in the scoping review can be found in Table 2

DISCUSSION

In this scoping review, we investigated the effects of manual therapy on rounded shoulder posture. All 10 studies examined in this review provided comprehensive information regarding the interventional protocol. The protocols employed varied among the studies. The therapy was administered in a structured manner, such as muscle energy technique and stretching technique targeted pectoralis minor muscle which is usually tight in a rounded shoulder posture. Some studies have used a combination of stretching and strengthening of agonist and antagonist muscles, which has proven to be beneficial in improving rounded shoulder posture. Based on the findings of this review, it can be concluded that treatment aimed at the pectoralis minor can benefit shoulder posture and muscle function and may be an important component of shoulder rehabilitation. (4)

In particular, manual therapy techniques, such as MET and stretching, appear to promote the lengthening of shortened anterior structures, thereby contributing to improved postural alignment in individuals with RSP (16). Some studies have reported improvements in postural parameters along with reductions in pain, with short-term benefits observed for up to several weeks (1). However, these findings should be interpreted cautiously because of the heterogeneity of the included studies. Not all studies reported significant improvements, and some showed limited or no effects of certain manual therapy interventions. This inconsistency highlights the need for careful interpretation and indicates that definitive conclusions regarding the effectiveness of this treatment cannot yet be established. Moreover, the combination of manual therapy with supplementary exercises aimed at scapular stabilization appears advantageous, further enhancing postural correction and muscle balance (11). This integrated approach aligns with the understanding that RSP is supported by muscular imbalances involving the pectoralis minor, trapezius, rhomboids, and other shoulder girdle muscles.(10) Targeting these muscles through manual elongation of tight musculature and strengthening of weak musculature techniques has a sound physiological basis, as evidenced by improvements in relevant outcome measures like acromial height, pectoralis minor length and forward shoulder angle (4). The included studies involved varied populations, and differences in factors such as age, activity level, and occupational demands may have influenced the response to manual therapy interventions. These variations should be considered when interpreting reported outcomes. Despite these positive outcomes, there is considerable heterogeneity in the specific manual therapy protocols employed. Many studies have adopted variations of MET (2,14,25), stretching(3,19), or mobilization(18) with different parameters, highlighting the lack of standardized treatment guidelines. This variability complicates protocol replication and clinical applications. Previous literature corroborates this, emphasizing that while manual therapy is effective, establishing a consensus on protocol components and durations is critical for optimizing patient outcomes (4). Many studies have focused on immediate or short-term outcomes, and it is uncertain whether the observed improvements translate into meaningful functional benefits or are sustained over time. Additionally, few studies have reported minimal clinically important differences (MCID), making it difficult to determine whether the magnitude of change is clinically significant. Therefore, while improvements have been reported, their long-term and functional impact requires further investigation (14)

Strengths and Limitations of the Study: This review provides a comprehensive overview of the available literature, summarizing key aspects such as intervention methods, sample sizes, duration of treatment, outcome measures, targeted muscles, and study conclusions. However, several limitations of this study should be acknowledged. First, a formal methodological quality or risk of bias assessment was not conducted. Consequently, the findings should be interpreted with caution, and no definitive conclusions regarding effectiveness can be drawn from them. Second, although the included studies involved specific populations, such as athletes, desk workers, and young adults, differences in demographic and activity-related factors may have influenced the treatment outcomes. Therefore, the generalization of the findings should be approached cautiously.

Table 1. Summary of 16 studies included in the scoping review investigated manual therapy for rounded shoulder posture

Author and year of publication	Targeted muscle	Intervention	Duration of intervention	Study population	Sample size	Outcome measures	Conclusion
Dr. Abhaya S. Mahadik (2023)(16)	Pectoralis minor	E1 - MET-PIR E2- PRT	Immediate effect	Healthy collegiate individuals with rounded shoulder posture	N- 60 (E1- 30, E2- 30)	Table top test	MET is more effective than PRT in reducing Pectoralis Minor tightness.
Upneet Kaur et.al (2023)(14)	Pectoralis minor	E- MET - PIR	Immediate effect	Computer users with rounded shoulder posture	N-56	PMLT	MET was highly efficient technique in improving PMi muscle length, reducing RSP
Shahnaz hasan (2022)(5)	Pectoralis minor lower trapezius	C- passive pectoralis minor stretching, E- passive pectoralis minor stretching with lower trapezius strengthening exercise	Five consecutive days a week for three weeks	Females with FSP	N-30 (C-30,E-30)	Pectoralis minor length test and universal goniometer.	The combined effect of Ltr-m strengthening and Pmi-m stretching was more beneficial than Pmi-m stretching alone in correcting the rounded shoulder posture
Jonathan roman (2018)(17)	Pectoralis minor	PRT for pectoralis minor	Immediate effect	Swimmers with rounded shoulder posture	N-33	Double square technique	A single treatment of PRT has an immediate effect in reducing resting pectoralis minor muscle length and decreasing RSP
		C -passive pectoralis minor	2session per week for 3 weeks			Total scapular distance (TSD) and normalized scapular abduction ratio (NSA ratio)	Pectoralis minor stretching alone and pectoralis minor stretching along with rhomboids strengthening both were equally effective techniques for management of RSP
Ayesha majeed (2021)(3)	Pectoralis minor	stretching only E-passive pectoralis minor stretching along with rhomboids strengthening training		Asymptomatic healthy individuals having RSP	N-32 (C-16,E-16)		
		C - no treatment, E1- scapular mobilization, E2-			N-52 (C-13, E1-13, E2-13, E3-13)		SM appears to be an effective technique to change scapular resting position in individuals with RSP.
Maedeh fani (2020)(18)	Pectoralis minor	pectoralis minor self-stretching, E3- pectoralis minor self-stretching with scapular mobilization	5 sessions	Participants with RSP		Plumb line for RSP	
Jalpa K. Patel (2019)(20)	Pectoralis minor	E-MET- PIR	Immediate effect	Healthy collegiate individuals with rounded shoulder posture	N-50	Pectoralis minor length test	MET can be included in lengthening the shortened pectoralis minor in collegiate individuals to prevent RSP and shoulder impingement syndrome.
Jayaraman, G.; (2019)(22)	Global	E -Myofascial release with Strengthening C-received Stretching with Strengthening	10 days in 2 weeks	Subjects with rounded shoulder posture	N-20 (C-10,E-10)	Table top test	MFR with strengthening is more effective than stretching with strengthening in improving RSP
Elizabeth A. Gross (2015)(15)	Pectoralis minor	C - no treatment, E-MET for pectoralis minor	6 weeks	Swimmers with rounded shoulder posture	N-36 (C-14,E-22)	Double square technique	MET had no effect on RSP or pectoralis minor length when compared to the control group
						Pectoralis minor	MET treatments applied to the pectoralis minor provided improvements in PML and RSP compared with a control group.
Kevin G. Laudner (2015)(2)	Pectoralis minor, rhomboid	E- MET - PIR, C- CP	2session per week for 6 weeks	Collegiate swimmers with RSP	N-39 (C-20,E-19)	length test, forward scapular position, and scapular upward rotation, 12 inch combination square ruler	

N: total sample size; E: experimental group; C: control group; CP: conventional physiotherapy, E1- experimental group 1, E2 – experimental group 2, PIR- post isometric relaxation, MET-muscle energy technique, PRT- positional release technique, FSP – forward shoulder posture, TSD – total scapular distance, KT- kinesio-taping, PMi-M – pectoralis minor muscle, Ltr-M – Lower trapezius muscle, CVA – craniovertebral angle, SM- Scapular Mobilization, PMLT-Pectoralis muscle length test

Third, the included studies varied in design, including randomized controlled trials, quasi-experimental studies, and immediate-effect studies, and were not stratified based on their levels of evidence. This methodological heterogeneity may further influence the interpretation and strength of these findings.

Future scope

Future research should focus on high-quality randomized controlled trials with larger and diverse populations to strengthen the evidence on manual therapy for rounded shoulder posture (RSP). Standardization of intervention protocols (technique, duration, and frequency) is needed to improve clinical applicability and reproducibility. Long-term studies are required to determine the sustainability and functional relevance of outcomes, along with inclusion of clinically meaningful measures such as MCID. Finally, future studies should aim to establish clinical guidelines for the management of RSP, integrating manual therapy within a comprehensive rehabilitation framework to improve both postural correction and functional performance.

CONCLUSION

There is a clear need for standardization of intervention protocols, including treatment techniques, duration, frequency, and progression criteria, to improve reproducibility and clinical applicability. However, the pectoralis minor is the most frequently targeted muscle, often addressed through manual therapy, alongside interventions for surrounding shoulder girdle muscles. Overall, while manual therapy shows potential benefits, the variability in protocols and assessment approaches limits definitive conclusions.

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