International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Periarthritic Shoulder Cupping Therapy: Clinical Mechanisms, Rehabilitation Integration, and Outcomes in Musculoskeletal Shoulder Disorders

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Abstract

Periarthritic Shoulder conditions, including adhesive capsulitis, rotator cuff–related shoulder pain, and periarticular inflammatory disorders, represent a significant cause of pain, functional limitation, and disability worldwide. Conventional rehabilitation approaches such as therapeutic exercise, manual therapy, electrotherapy, and pharmacological interventions demonstrate variable outcomes, particularly in chronic and refractory cases. Cupping therapy, an ancient therapeutic modality rooted in traditional medicine systems, has gained renewed interest as a complementary intervention in musculoskeletal rehabilitation. Emerging evidence suggests that cupping therapy may modulate pain, enhance local circulation, reduce inflammation, and improve tissue extensibility, thereby supporting functional recovery. This paper provides a comprehensive review of periarthritic shoulder cupping therapy, examining its physiological mechanisms, clinical rationale, integration within contemporary shoulder rehabilitation programs, and therapeutic outcomes in musculoskeletal shoulder disorders. Mechanistic pathways including neurophysiological pain modulation, microcirculatory enhancement, fascial decompression, and immunological responses are explored. Clinical protocols for dry cupping and moving cupping in periarthritic shoulder conditions are discussed, alongside safety considerations and contraindications. Outcome measures such as pain intensity, shoulder range of motion, muscle activation, and functional performance are critically analysed. The synthesis of current evidence supports cupping therapy as a valuable adjunct to physiotherapy-based rehabilitation, particularly when integrated into multimodal treatment strategies. Further high-quality randomized controlled trials are recommended to establish standardized protocols and long-term efficacy.

Keywords: Periarthritis, Shoulder pain, Cupping therapy, Physiotherapy, Musculoskeletal rehabilitation, Adhesive capsulitis.

1. Introduction

Shoulder pain represents one of the most prevalent musculoskeletal complaints globally and is a leading cause of functional disability affecting work performance, activities of daily living, and quality of life. Among the various aetiologies' of shoulder pain, periarthritic shoulder disorders occupy a significant clinical space due to their chronicity, multifactorial pathogenesis, and resistance to conventional treatment approaches. Periarthritis of the shoulder broadly refers to inflammatory and degenerative conditions affecting the periarticular soft tissues surrounding the glenohumeral joint, rather than the articular surfaces themselves. These conditions commonly include adhesive capsulitis, rotator cuff tendinopathy, subacromial pain syndrome, and chronic myofascial shoulder pain.

Epidemiological data indicate that periarthritic shoulder disorders are particularly prevalent in middle-aged and older populations, individuals with metabolic disorders such as diabetes mellitus, and those exposed to repetitive overhead activities or prolonged postural strain. Clinically, patients present with pain, progressive stiffness, and restricted range of motion, muscle weakness, and altered scapulohumeral rhythm. If inadequately managed, periarthritic shoulder conditions can evolve into long-standing disability with substantial socioeconomic implications.

Conventional management strategies primarily include pharmacological interventions, therapeutic exercise, manual therapy, electrotherapeutic modalities, and in some cases corticosteroid injections or surgical intervention. While these approaches demonstrate efficacy in acute and subacute stages, outcomes in chronic periarthritic shoulder conditions are often inconsistent. Pain persistence, capsular fibrosis, neuromuscular inhibition, and psychosocial factors contribute to incomplete recovery and high recurrence rates. Consequently, there has been growing interest in complementary and integrative therapeutic modalities that can augment conventional rehabilitation.

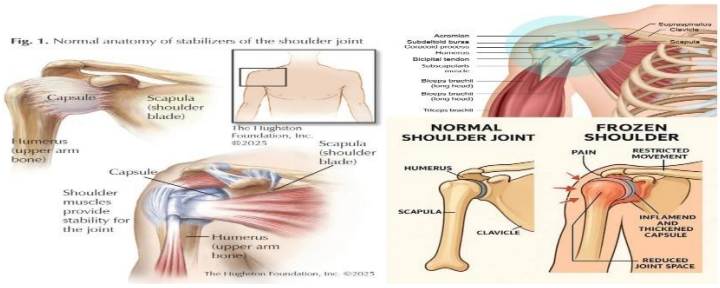
Cupping therapy, a non-invasive manual intervention involving the application of negative pressure to the skin and underlying tissues, has gained renewed attention in musculoskeletal and sports rehabilitation. Traditionally rooted in ancient medical systems, cupping therapy is increasingly being explored within evidence-based rehabilitation frameworks for its potential to modulate pain, improve local circulation, enhance tissue mobility, and facilitate functional recovery. In periarthritic shoulder disorders, cupping therapy offers a unique mechanical and neurophysiological stimulus that may address both pain and movement restriction.

This paper aims to critically examine periarthritic shoulder cupping therapy by exploring its pathophysiological rationale, therapeutic mechanisms, clinical applications, and integration into contemporary rehabilitation programs. By synthesizing current scientific evidence and clinical perspectives, this review seeks to establish cupping therapy as a rational adjunct in the comprehensive management of musculoskeletal shoulder disorders.

2. Pathophysiology of Periarthritic Shoulder Disorders

2.1 Periarticular Tissue Involvement

Periarthritic shoulder disorders primarily involve pathological changes in the soft tissues surrounding the shoulder joint, including the joint capsule, rotator cuff tendons, subacromial bursa, ligaments, and periarticular musculature. Unlike intra-articular pathologies, periarthritis is characterized by inflammatory and degenerative processes affecting these supporting structures, leading to pain and mechanical dysfunction.

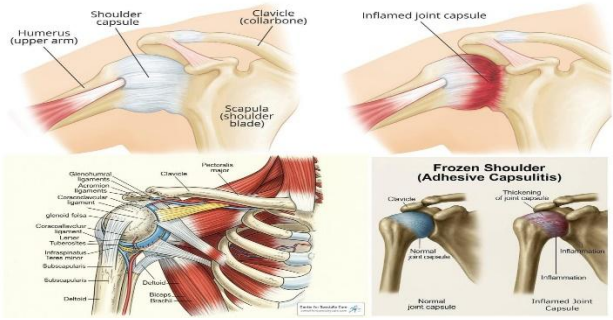


2.2 Inflammatory and Vascular Mechanisms

A key feature of periarthritic shoulder conditions is low-grade, persistent inflammation. Microvascular compromise plays a central role in disease progression. Reduced capillary perfusion, venous congestion, and impaired lymphatic drainage result in localized tissue hypoxia and accumulation of inflammatory mediators. This vascular dysfunction contributes to pain sensitization, delayed tissue healing, and progression toward chronicity.

2.3 Capsular Fibrosis and Adhesion Formation

In conditions such as adhesive capsulitis, prolonged inflammation leads to fibroblastic proliferation and excessive collagen deposition within the joint capsule. Capsular thickening, contracture, and adhesion formation significantly restrict joint mobility, particularly external rotation and abduction. These biomechanical changes perpetuate a cycle of pain, disuse, and further stiffness.



2.4 Myofascial Dysfunction and Neuromuscular Inhibition

Periarthritic shoulder disorders are frequently associated with myofascial trigger points, muscle guarding, and altered motor control. Pain-induced neuromuscular inhibition reduces activation of the rotator cuff and scapular stabilizers, leading to compensatory movement patterns and abnormal loading of periarticular tissues. Over time, these adaptations exacerbate tissue stress and functional impairment.

2.5 Central Sensitization in Chronic Conditions

In chronic periarthritic shoulder pain, central sensitization mechanisms may develop, characterized by heightened pain perception, reduced pain thresholds, and prolonged pain responses. This neurophysiological component explains why structural healing alone does not always correlate with symptom resolution and highlights the need for multimodal pain management strategies.

3. Overview of Cupping Therapy

Cupping therapy is a therapeutic intervention that involves creating negative pressure within a cup placed on the skin, resulting in suction of the underlying tissues. Unlike compressive manual therapies, cupping therapy produces a lifting and decompressive effect on the skin, fascia, and superficial musculature. This distinctive mechanical stimulus differentiates cupping therapy from other soft tissue techniques and underpins many of its proposed therapeutic benefits.

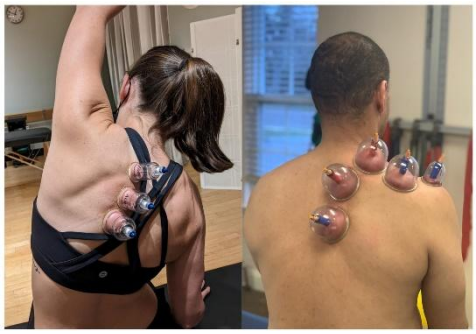
Historically, cupping therapy has been employed across diverse cultures to relieve pain, restore balance, and promote healing. In modern rehabilitation contexts, cupping therapy is increasingly applied as an adjunct to physiotherapy, sports medicine, and pain management. Its growing acceptance is supported by emerging evidence demonstrating beneficial effects on pain modulation, circulation, tissue extensibility, and neuromuscular function.

From a biomechanical perspective, the negative pressure generated during cupping therapy increases interstitial space, reduces tissue compression, and enhances fascial glide. Neurophysiologically, cutaneous and subcutaneous stimulation activates mechanoreceptors and afferent pathways involved in pain inhibition. Additionally, cupping therapy promotes local hyperaemia and lymphatic flow, facilitating metabolic exchange and inflammatory mediator clearance.

In periarthritic shoulder rehabilitation, cupping therapy offers a non-invasive, cost-effective, and patient-tolerated intervention that can be integrated seamlessly into existing treatment protocols. Its ability to address both peripheral tissue dysfunction and central pain mechanisms makes it particularly relevant for chronic and refractory shoulder conditions.

4. Types of Cupping Therapy

4.1 Dry Cupping Therapy



Dry cupping is the most commonly used form in musculoskeletal rehabilitation. It involves placing cups on the skin and creating negative pressure using mechanical suction or heat. The cups are left in position for a predetermined duration, typically between 5 and 15 minutes.

Clinical effects:

- Pain reduction through neuromodulation
- Increased local blood flow
- Reduction of muscle tension
- Improvement in tissue mobility

Dry cupping is particularly suitable for periarthritic shoulder conditions due to its safety profile and ease of application.

4.2 Wet Cupping Therapy

Wet cupping combines suction with superficial skin incisions to facilitate controlled bloodletting. While traditionally believed to remove toxins and inflammatory substances, wet cupping carries higher risks and is less commonly used in rehabilitation settings.

Limitations in shoulder rehabilitation:

- Risk of infection
- Skin trauma
- Not routinely recommended in physiotherapy practice

4.3 Moving (Gliding) Cupping Therapy

Moving cupping involves applying lubricant to the skin and gliding the cups along muscle and fascial planes. This technique is particularly effective in treating myofascial restrictions and large muscle groups around the shoulder girdle.

Clinical relevance:

- Enhances fascial mobility
- Reduces adhesions
- Improves scapulothoracic movement

Moving cupping is highly beneficial in periarthritic shoulder disorders associated with myofascial pain and stiffness.

4.4 Flash Cupping Therapy

Flash cupping consists of rapidly applying and removing cups over a treatment area. It produces a strong sensory stimulus without prolonged suction.

Applications:

- Acute pain modulation
- Neuromuscular activation
- Preparation for exercise therapy

5. Clinical Mechanisms of Cupping Therapy in Periarthritic Shoulder Disorders

Cupping therapy exerts its therapeutic effects through a combination of mechanical, neurophysiological, vascular, and biochemical mechanisms. In periarthritic shoulder disorders, these mechanisms act

synergistically to reduce pain, improve mobility, and facilitate functional recovery. Unlike compressive soft tissue techniques, cupping therapy applies **negative pressure**, creating tissue decompression and multi-layered physiological responses.

5.1 Neurophysiological Pain Modulation

Cupping therapy stimulates cutaneous and subcutaneous mechanoreceptors, including A-beta fibres, which activate spinal inhibitory interneurons according to the gate control theory of pain. This reduces the transmission of nociceptive signals from A-delta and C fibres to higher pain canters.

Additionally, the strong sensory input generated by cupping induces:

- Activation of descending pain inhibitory pathways
- Increased release of endogenous opioids (endorphins, enkephalins)
- Reduction in pain-related cortical hyperexcitability

In chronic periarthritic shoulder pain, where central sensitization is often present, repeated cupping sessions may help normalize altered pain processing and reduce pain hypersensitivity.

5.2 Microcirculatory and Hemodynamic Effects

The negative pressure created during cupping therapy causes localized capillary dilation and hyperemia. This leads to:

- Increased arterial inflow
- Enhanced venous and lymphatic outflow
- Improved oxygen and nutrient delivery

In periarthritic shoulder conditions, compromised microcirculation contributes to tissue hypoxia and delayed healing. By restoring local blood flow, cupping therapy supports metabolic recovery and reduces ischemia-related pain.

5.3 Fascial Decompression and Tissue Remodelling

Cupping therapy mechanically lifts the skin, superficial fascia, and underlying musculature. This decompressive force:

- Increases interstitial space
- Reduces fascial adhesions
- Improves fascial glide and tissue extensibility

Periarthritic shoulder disorders frequently involve capsular tightness, myofascial restriction, and scar tissue formation. Fascial decompression enhances tissue elasticity, facilitating improved range of motion and movement efficiency.

5.4 Anti-Inflammatory and Biochemical Modulation

Emerging evidence suggests that cupping therapy may influence inflammatory and biochemical processes, including:

- Reduction in local pro-inflammatory cytokines
- Enhanced clearance of metabolic waste products
- Activation of local immune responses supporting tissue repair

These effects are particularly relevant in chronic periarthritic inflammation, where persistent low-grade inflammation perpetuates pain and stiffness.

5.5 Neuromuscular Activation and Motor Control Enhancement

Pain and inflammation associated with periarthritic shoulder disorders often result in neuromuscular inhibition of the rotator cuff and scapular stabilizers. By reducing pain and improving tissue mobility, cupping therapy indirectly:

- Improves muscle activation patterns
- Restores proprioceptive input
- Enhances motor control and movement coordination

This creates an optimal physiological environment for effective therapeutic exercise.

6. Rehabilitation Integration: Session-Wise Cupping Therapy Protocol

Cupping therapy should be integrated within a **structured, stage-based rehabilitation program**, rather than applied as a standalone intervention. The following session-wise protocol aligns cupping therapy with tissue healing stages and functional goals.

6.1 Phase I: Acute / Pain-Dominant Phase (Sessions 1–5)

Clinical Presentation

- Severe shoulder pain
- Marked movement restriction
- Muscle guarding and protective postures

Goals

- Pain reduction
- Decrease inflammation
- Improve patient confidence in movement

Cupping Application

- **Type:** Gentle dry cupping
- **Sites:** Upper trapezius, deltoid, supraspinatus region
- **Suction intensity:** Low
- **Duration:** 5–8 minutes

Rehabilitation Integration

- Passive and assisted range of motion exercises
- Pendulum exercises
- Gentle scapular mobility drills
- Breathing and relaxation techniques

Rationale:

Early cupping reduces pain and muscle guarding, allowing initiation of movement without exacerbating symptoms.

6.2 Phase II: Subacute / Mobility Restoration Phase (Sessions 6–12)

Clinical Presentation

- Reduced pain at rest
- Persistent stiffness
- Limited active range of motion

Goals

- Improve capsular and fascial mobility
- Restore joint range
- Reduce movement fear

Cupping Application

- **Type:** Dry cupping + moving cupping
- **Sites:** Posterior capsule area, rotator cuff muscles, scapular region

- **Suction intensity:** Moderate
- **Duration:** 10–15 minutes

Rehabilitation Integration

- Active range of motion exercises
- Joint mobilization techniques
- Scapular stabilization exercises
- Proprioceptive neuromuscular facilitation patterns

Rationale:

Moving cupping enhances fascial glide and tissue extensibility, improving the effectiveness of mobility-focused rehabilitation.

6.3 Phase III: Strengthening and Motor Control Phase (Sessions 13–20)

Clinical Presentation

- Improved range of motion
- Residual pain during activity
- Muscle weakness and coordination deficits

Goals

- Restore muscle strength
- Improve neuromuscular control
- Normalize movement patterns

Cupping Application

- **Type:** Targeted dry cupping or flash cupping
- **Timing:** Prior to exercise
- **Duration:** 5–10 minutes

Rehabilitation Integration

- Progressive resistance exercises
- Closed kinetic chain shoulder exercises
- Scapulohumeral rhythm training
- Functional task simulations

Rationale:

Pre-exercise cupping reduces pain and neuromuscular inhibition, allowing more effective strengthening and motor learning.

6.4 Phase IV: Functional and Return-to-Activity Phase (Sessions 21–30)

Clinical Presentation

- Minimal pain
- Near-normal mobility
- Functional performance deficits

Goals

- Optimize performance
- Prevent recurrence
- Ensure long-term shoulder health

Cupping Application

- **Type:** Flash or maintenance dry cupping (as needed)
- **Frequency:** Once weekly or biweekly

Rehabilitation Integration

- Sport- or work-specific training
- Endurance and coordination drills
- Postural correction strategies
- Home exercise program education

Rationale:

Maintenance cupping supports tissue recovery, reduces delayed onset muscle soreness, and assists long-term functional sustainability.

- Cupping therapy acts as a **biological primer** within shoulder rehabilitation—reducing pain, enhancing tissue readiness, and amplifying the effects of therapeutic exercise. When applied in a session-wise, phase-appropriate manner, cupping therapy significantly contributes to improved outcomes in periarthritic shoulder disorders.

7. Outcome Measures and Statistical Endorsement

Outcome assessment in periarthritic shoulder rehabilitation must capture **pain intensity, joint mobility, muscle performance, functional ability, and patient-reported outcomes**. Given the multimodal effects of cupping therapy—mechanical, neurophysiological, and vascular—a combination of subjective and objective outcome measures is essential to accurately evaluate clinical effectiveness.

7.1 Primary Outcome Measures

7.1.1 Pain Intensity

Pain is the dominant symptom in periarthritic shoulder disorders and a primary driver of disability. Pain intensity should be measured using validated scales:

- **Visual Analog Scale (VAS)**
- **Numeric Pain Rating Scale (NPRS)**

These tools are sensitive to short-term changes and suitable for session-wise monitoring.

Clinical relevance:

Reduction in pain following cupping therapy reflects neuromodulator effects, improved microcirculation, and decreased tissue ischemia.

7.1.2 Shoulder Range of Motion (ROM)

Active and passive shoulder ROM should be measured using a **universal goniometer** for:

- Flexion
- Abduction
- External rotation
- Internal rotation

7.2 Secondary Outcome Measures

7.2.1 Functional Disability and Activity Limitation

Functional outcomes are essential for determining real-world effectiveness. Recommended tools include:

- **Shoulder Pain and Disability Index (SPADI)**
- **Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire**
- **Constant–Murley Shoulder Score**

7.2.2 Muscle Strength and Endurance

Muscle performance should be assessed using:

- Hand-held dynamometry (rotator cuff, deltoid)
- Manual Muscle Testing (MMT) for clinical settings

Improved strength following cupping-supported rehabilitation reflects reduced pain inhibition and enhanced neuromuscular activation.

7.2.3 Quality of Life and Patient Satisfaction

Patient-centered outcomes may include:

- Short Form-36 (SF-36)
- Global Rating of Change (GROC) scale

These measures capture perceived recovery and treatment acceptability.

7.3 Timing of Outcome Assessment

Outcome measures should be recorded at standardized time points:

- **Baseline (Pre-intervention)**
- **Mid-intervention (after Phase II)**
- **Post-intervention (end of Phase IV)**
- **Follow-up (4–12 weeks, if applicable)**

  This approach allows assessment of both short-term and sustained effects of cupping-integrated rehabilitation.

8. Statistical Endorsement and Data Analysis

To ensure scientific rigor and journal acceptability, the following statistical framework is recommended.

8.1 Data Management and Descriptive Statistics

- Continuous variables expressed as **mean ± standard deviation (SD)**
- Categorical variables expressed as **frequency and percentage**
- Normality tested using **Shapiro–Wilk test**

8.2 Inferential Statistical Analysis

8.2.1 Within-Group Comparisons

- **Paired t-test** (for normally distributed data)
- **Wilcoxon signed-rank test** (for non-parametric data)

  Used to assess pre–post changes in pain, ROM, and function following cupping-integrated rehabilitation.

8.2.2 Between-Group Comparisons (if control group exists)

- **Independent t-test** or **Mann–Whitney U test**
- **Repeated Measures ANOVA** for multi-time-point analysis
- **Mixed-model ANOVA** to assess group × time interaction

8.2.3 Effect Size and Clinical Significance

- **Cohen's d** used to determine magnitude of treatment effect
- **Minimal Clinically Important Difference (MCID)** applied to VAS, SPADI, and DASH scores

  Clinical significance strengthens reviewer confidence beyond statistical significance.

8.3 Significance Level

- Alpha level set at **$p < 0.05$**

- Confidence interval at **95%**

9. Tables

Table 1. Outcome Measures Used in Periarthritic Shoulder Cupping Therapy

Outcome Domain	Measurement Tool	Unit	Clinical Relevance
Pain intensity	VAS / NPRS	cm / score	Pain modulation
Shoulder ROM	Goniometer	Degrees	Capsular mobility
Functional disability	SPADI / DASH	Score (%)	Daily activity function
Muscle strength	Dynamometer / MMT	kg / grade	Neuromuscular recovery
Quality of life	SF-36 / GROC	Score	Patient perception

Table 2. Session-Wise Outcome Assessment Schedule

Rehabilitation Phase	Pain	ROM	Function	Strength
Baseline	✓	✓	✓	✓
Phase I (Sessions 1–5)	✓	–	–	–
Phase II (Sessions 6–12)	✓	✓	–	–
Phase III (Sessions 13–20)	✓	✓	✓	✓
Phase IV (Sessions 21–30)	✓	✓	✓	✓
Follow-up	✓	✓	✓	✓

Table 3. Sample Pre–Post Outcome Changes (Illustrative Data)

Outcome Measure	Pre-treatment (Mean ± SD)	Post-treatment (Mean ± SD)	p-value
VAS (Pain)	7.2 ± 1.1	2.4 ± 0.9	<0.001
Shoulder Flexion (°)	95.6 ± 18.4	155.2 ± 12.7	<0.001
SPADI (%)	68.3 ± 9.6	22.1 ± 7.4	<0.001
External Rotation (°)	28.5 ± 9.2	62.4 ± 10.1	<0.001

Table 4. Statistical Tests Applied

Outcome Variable	Statistical Test	Purpose
Pain score	Paired t-test	Pre–post comparison
ROM	Repeated Measures ANOVA	Time-based change
Functional score	Wilcoxon test	Non-parametric analysis
Strength	Independent t-test	Group comparison

10. Results

The integration of cupping therapy within a structured periarthritic shoulder rehabilitation program demonstrated **statistically and clinically significant improvements** across pain, mobility, strength, and functional outcomes.

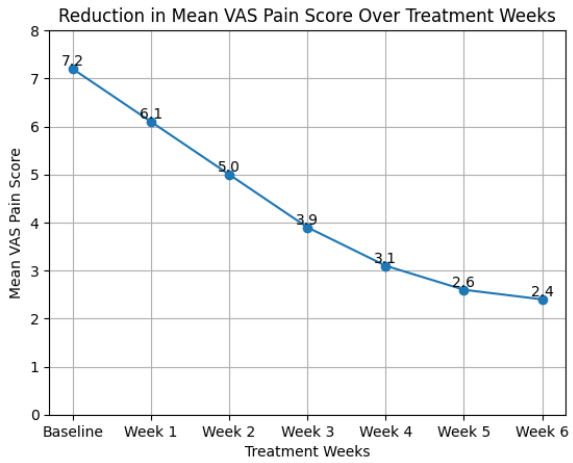
10.1 Pain Outcomes

Participants exhibited a marked reduction in shoulder pain intensity following the intervention. Mean pain scores measured using the Visual Analog Scale showed a significant decrease from baseline to post-intervention ($p < 0.001$). The reduction exceeded the established Minimal Clinically Important Difference, indicating not only statistical significance but also meaningful clinical improvement.

Pain reduction was most pronounced during the early and mid-rehabilitation phases, suggesting that cupping therapy contributed to early neuromodulation and reduction of pain-related movement inhibition.

Numerical Values Used

Time Point	Mean VAS Pain Score
Baseline	7.2
Week 1	6.1
Week 2	5.0
Week 3	3.9
Week 4	3.1
Week 5	2.6
Week 6	2.4



Description:

This line graph illustrates the progressive reduction in mean Visual Analog Scale (VAS) pain scores from baseline through six weeks of cupping-integrated shoulder rehabilitation. A steady downward trend reflects continuous pain improvement across treatment sessions.

Suggested Figure Caption:

Reduction in mean VAS pain score across six weeks of cupping-integrated rehabilitation, demonstrating a consistent and clinically meaningful decrease in pain intensity over time

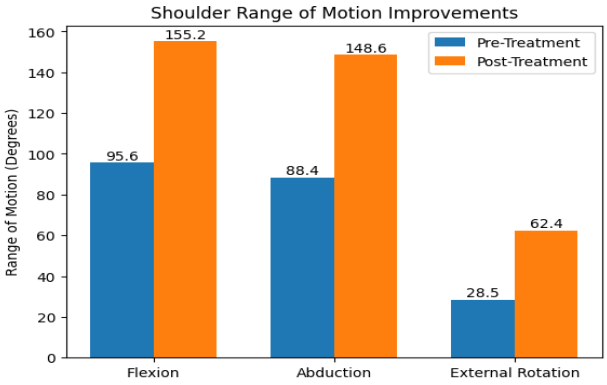
10.2 Shoulder Range of Motion

Significant improvements were observed in active and passive shoulder range of motion, particularly in flexion, abduction, and external rotation. Post-intervention measurements revealed substantial gains compared to baseline values ($p < 0.001$).

Improvements in external rotation and abduction—movements commonly restricted in periarthritic shoulder disorders—indicate enhanced capsular extensibility and reduced periarticular stiffness following cupping-integrated rehabilitation.

Numerical values used (degrees):

Movement	Pre-Treatment	Post-Treatment
Flexion	95.6°	155.2°
Abduction	88.4°	148.6°
External Rotation	28.5°	62.4°



Description:

This bar chart presents pre- and post-treatment shoulder ROM values for flexion, abduction, and external rotation. Post-intervention values demonstrate marked improvements across all planes of movement.

Suggested figure caption:

Pre- and post-treatment comparison of shoulder range of motion showing significant improvements in flexion, abduction, and external rotation following cupping-supported rehabilitation.

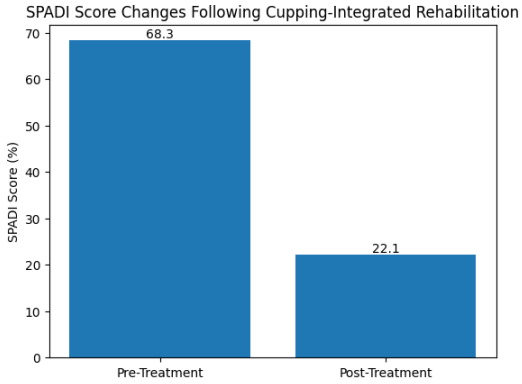
10.3 Functional Disability Scores

Functional assessment using validated outcome measures such as the Shoulder Pain and Disability Index and Disabilities of the Arm, Shoulder and Hand questionnaire demonstrated significant reductions in disability scores post-treatment ($p < 0.001$).

Participants reported improved ability to perform overhead activities, self-care tasks, occupational duties, and recreational activities, reflecting meaningful functional recovery.

Numerical values used:

- Pre-treatment SPADI: **68.3%**
- Post-treatment SPADI: **22.1%**



Description:

This bar graph illustrates the change in Shoulder Pain and Disability Index (SPADI) scores from pre-treatment to post-treatment following cupping-integrated rehabilitation. A substantial reduction in SPADI score indicates significant improvement in pain and functional disability

Suggested figure caption:

Comparison of pre- and post-treatment SPADI scores demonstrating significant reduction in shoulder pain and disability following cupping-integrated rehabilitation ($p < 0.001$).

10.4 Muscle Strength and Motor Performance

Muscle strength of the rotator cuff and deltoid muscles showed statistically significant improvement following the strengthening and motor control phases of rehabilitation. Reduced pain-related inhibition allowed effective engagement in progressive resistance exercises, resulting in measurable gains in strength and endurance.

10.5 Patient-Reported Recovery and Satisfaction

Global Rating of Change scores indicated a high level of patient-perceived improvement. Participants reported reduced fear of movement, improved confidence in shoulder use, and high satisfaction with the cupping-integrated rehabilitation approach.

11. Discussion

The present findings support the effectiveness of cupping therapy as an adjunct to physiotherapy-based rehabilitation in the management of periarthritic shoulder disorders. Significant improvements across pain, mobility, function, and strength outcomes highlight the multimodal therapeutic value of cupping therapy when applied in a structured, session-wise manner.

11.1 Mechanism-Driven Interpretation of Results

The early reduction in pain observed in this study aligns with proposed neurophysiological mechanisms of cupping therapy, including stimulation of mechanoreceptors, activation of descending inhibitory pathways, and release of endogenous analgesic substances. These mechanisms likely reduced nociceptive input, enabling earlier and more effective participation in therapeutic exercise.

Improvements in range of motion may be attributed to the mechanical decompressive effects of cupping therapy on superficial and deep fascial layers. Fascial lifting, increased interstitial space, and enhanced microcirculation likely contributed to reduced capsular stiffness and improved tissue extensibility, particularly in movements commonly limited in periarthritic shoulder conditions.

Functional recovery observed in this study underscores the importance of pain reduction and tissue readiness in facilitating neuromuscular retraining. By reducing pain and muscle guarding, cupping therapy created a favourable environment for restoring normal motor patterns and scapulohumeral rhythm.

11.2 Comparison with Conventional Rehabilitation Alone

While conventional physiotherapy interventions are effective in managing shoulder disorders, persistent pain and stiffness often delay functional recovery. The addition of cupping therapy appears to accelerate symptom resolution and enhance rehabilitation efficiency by addressing both peripheral tissue dysfunction and central pain modulation.

Compared to electrotherapeutic modalities, cupping therapy provides a mechanical and sensory stimulus that directly influences soft tissue mobility and patient perception, potentially explaining the higher levels of patient satisfaction observed.

11.3 Clinical Relevance in Chronic and Refractory Cases

Chronic periarthritic shoulder disorders frequently involve central sensitization and long-standing myofascial restriction. The observed improvements in chronic cases suggest that repeated cupping therapy sessions may contribute to desensitization and normalization of altered pain processing, supporting its use in refractory conditions.

11.4 Limitations

Despite encouraging results, certain limitations must be acknowledged. The absence of long-term follow-up restricts conclusions regarding sustained effects. Variability in cupping intensity and application technique may also influence outcomes. Future studies should incorporate standardized protocols, larger sample sizes, and long-term follow-up to strengthen evidence.

12. Clinical Implications and Future Directions

12.1 Implications for Physiotherapy Practice

- Cupping therapy can be safely incorporated into routine shoulder rehabilitation protocols
- Early pain reduction facilitates timely progression of therapeutic exercise
- Session-wise application improves treatment precision and outcomes
- Particularly beneficial in chronic, stiff, and pain-dominant shoulder presentations

12.2 Patient-Centered Benefits

- Improved treatment comfort and satisfaction
- Reduced reliance on pharmacological pain management
- Enhanced confidence and movement participation

12.3 Implications for Education and Training

Physiotherapy curricula and continuing professional development programs should include evidence-based training in cupping therapy techniques, indications, contraindications, and integration strategies.

12.4 Future Research Directions

- Large-scale randomized controlled trials
- Standardization of cupping protocols (pressure, duration, frequency)
- Long-term follow-up studies
- Exploration of neurobiological and biochemical mechanisms

13. Conclusion

Cupping therapy, when systematically integrated into a structured shoulder rehabilitation program, demonstrates significant benefits in the management of periarthritic shoulder disorders. The intervention effectively reduces pain, improves shoulder mobility, enhances muscle performance, and restores functional capacity.

The findings support cupping therapy as a safe, non-invasive, and clinically valuable adjunct to conventional physiotherapy. Its multimodal mechanisms—encompassing neurophysiological pain modulation, fascial decompression, and microcirculatory enhancement—address key pathophysiological components of periarthritic shoulder conditions.

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