RESEARCH PAPER

"EFFECTIVENESS OF SHOULDER GLIDES VERSUS SHOULDER CAPSULAR STRETCHING IN ADHESIVE CAPSULITIS – A COMPARATIVE STUDY"

Authors
[1]Sakshi Agarwal, [2]Dr. Renuka Pal, [3]Laxmi Gupta, [4]Dr. Jafar Khan, [5]Dr. Vaishnavi Jaykant Kania, [6]Dr. Abid R. Qureshi, [7]Dr. Abhishek Arora, [8]Dr. Hasnen Sheikh, [9]Vaishnav Vilasrao Shende, [10]Parul Sharma
[1]M.P.Th. scholar, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[2]Professor, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[3]M.P.Th. scholar, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[4]Dean & HOD, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[5] Assistant Professor, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[6] Assistant Professor, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[7] Assistant Professor, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[8]Assistant Professor, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[9]M.P.Th. scholar, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan
[10]M.P.Th. scholar, Pacific college of Physiotherapy, Pacific medical university, Udaipur, Rajasthan

ABSTRACT

Background and objective

Adhesive capsulitis is a painful shoulder condition characterized by pain, restricted range of motion, and functional disability. Shoulder glides and capsular stretching are commonly used physiotherapy interventions for its management. To compare the effectiveness of shoulder glide and shoulder capsular stretching in reducing pain and improving shoulder range of motion and functional ability in individuals with adhesive capsulitis.

Methods

A total of 60 participants aged 40-60 years with adhesive capsulitis were selected using simple random sampling and equally divided into two groups. Group A (n=30) received shoulder glide techniques, while Group B (n=30) received capsular stretching. Pain, shoulder range of motion, and functional ability were assessed using the Visual Analogue Scale (VAS), shoulder ROM measurements, and Shoulder Pain and Disability Index (SPADI), respectively. Within-group and between-group comparisons were performed using paired and unpaired t-tests, with statistical significance set at $p < 0.05$.

Results:

Both groups demonstrated statistically significant improvements in pain, shoulder ROM, and functional ability following intervention ($p < 0.001$). However, between-group analysis showed that Group A (shoulder glide) demonstrated significantly greater improvement than Group B (capsular stretching) across all measured outcomes ($p < 0.001$). Post-intervention pain was lower and improvements in shoulder flexion, abduction, external rotation, internal rotation, and SPADI scores were greater in the Group A.

Conclusion:

The study concluded that both interventions were effective in improving pain, shoulder mobility, and functional ability in individuals with adhesive capsulitis. However, shoulder glides was significantly more effective than capsular stretching in improving the measured clinical outcomes.

Keywords: Adhesive capsulitis, Shoulder glide, Capsular stretching, Pain, Range of motion, SPADI, Functional disability.

How to cite this article: 1Sakshi Agarwal 2Dr. Renuka Pal 3Laxmi Gupta 4Dr. Jafar Khan 5Dr. Vaishnavi Jaykant Kania 6Dr. Abid R. Qureshi 7Dr. Abhishek Arora 8Dr. Hasnen Sheikh 9Vaishnav Vilasrao Shende 10Parul Sharma. "EFFECTIVENESS OF SHOULDER GLIDES VERSUS SHOULDER CAPSULAR STRETCHING IN ADHESIVE CAPSULITIS – A COMPARATIVE STUDY". Int J Drug Deliv Technol. 2026;16(76s):1102-1106. DOI: 10.25258/ijddt.16.76s.192

RESEARCH PAPER

.INTRODUCTION:

Adhesive capsulitis, commonly known as frozen shoulder, is a painful musculoskeletal disorder characterized by progressive stiffness and restricted active and passive range of motion (ROM) of the shoulder. It commonly affects individuals between 40 and 65 years, with a higher prevalence among females. Systemic conditions such as diabetes mellitus, thyroid dysfunction, and cardiovascular disorders may increase the risk of developing adhesive capsulitis. The condition typically progresses through three stages: freezing, frozen, and thawing, with recovery ranging from months to years.

The pathology involves inflammation and fibrosis of the joint capsule, resulting in capsular thickening, reduced joint volume, and characteristic restrictions in shoulder movement. The primary goals of physiotherapy management are pain reduction, restoration of ROM, and improvement of functional ability. Joint mobilization and capsular stretching are commonly used interventions for improving shoulder mobility and reducing disability.

Joint mobilization involves graded gliding techniques to restore normal arthrokinematics and may help improve ROM and reduce pain through mechanical and neurophysiological mechanisms. Capsular stretching, on the other hand, aims to increase capsular extensibility through sustained stretching and is commonly used to improve shoulder mobility.

Although both joint mobilization and capsular stretching are widely used in the management of adhesive capsulitis, evidence regarding their relative effectiveness remains limited.

Therefore, this study aimed to compare the effectiveness of shoulder glide and shoulder capsular stretching on pain, range of motion, and functional ability in individuals with adhesive capsulitis.

AIM & OBJECTIVES OF THE STUDY

The aim of the study is to compare the effectiveness of shoulder joint glides and shoulder capsular stretching in improving pain, range of motion, and functional outcomes in individuals with adhesive capsulitis. Specific objective were:

- To determine if one technique leads to faster or more sustained improvements in symptoms and function.
- To compare changes in pain intensity using a standardized pain scale (e.g., Visual Analog Scale - VAS) between both interventions.
- To measure improvement in active and passive range of motion (especially abduction, external rotation, and flexion) in both treatment groups.

MATERIALS AND METHOD

Sixty patients were selected through simple random sampling, Ethical approval was taken from the Institutional Ethical Committee of Pacific Medical College with the registration number - **PMU/IEC/MPT/2025/19**

The sample population was randomly divided in two groups:

- Group A: Shoulder Glides (n = 30)
- Group B: Shoulder Capsular Stretching (n = 30)

The study was directed over a period of 4 weeks, with patients engaging in the intervention for 30 minutes per day, five days per week. All, patients of the study were informed about the study steps, and the expected benefits were explained before signing the informed consent. All patients included in this study were to sign informed consent.

INTERVENTION

Group A: SHOULDER MOBILIZATION

In group A following treatment were given:

S.No.	Glide Type	Direction of Force	Position (Patient/Therapist)	Targeted Movement	Repetitions	Hold Time	Rest Interval
1	**Posterior Glide**	Posterior (backward)	Supine, arm in slight abduction / Standing at side	Flexion, Internal Rotation	3–5 reps	30–60 seconds each	30 seconds
2	**Inferior Glide**	Inferior (downward)	Supine, arm at 90° abduction / Standing at head	Abduction, Capsular Stretch	3–5 reps	30–60 seconds each	30 seconds
3	**Anterior Glide**	Anterior (forward)	Prone or supine, arm near edge of table / Therapist beside joint	Extension, External Rotation	3–5 reps	30–60 seconds each	30 seconds
4	**Lateral Distraction**	Lateral (outward)	Supine, arm in resting (open-packed) position / Therapist facing axilla	Pain Relief, Joint Play	3–5 reps	30–60 seconds each	30 seconds

Progression Over 4 Weeks:

- **Week 1:** Treatment will focus on reducing pain and muscle guarding using gentle mobilization techniques within the pain-free range.
- **Week 2:** The intensity of mobilizations will be increased to target joint restrictions and improve range of motion.
- **Week 3:** Higher-grade mobilizations will be introduced to address capsular tightness and enhance movement at the end range.
- **Week 4:** The goal will be to maintain gained mobility, restore functional movements, and prepare the patient for independent activity with maximum shoulder range and reduced pain.

Additional Notes:

- Moist heat packs may be applied for 10–15 minutes prior to each session to help reduce muscle stiffness, increase blood circulation, and

prepare the shoulder joint for mobilization or stretching.

- In cases where participants experience increased pain or inflammation post-treatment, a cold pack may be applied for 10–15 minutes immediately after the session to minimize soreness and reduce swelling.

Group B: SHOULDER CAPSULAR STRETCHING

In Group B following treatment were given:

S. No.	Targeted Capsule	Patient Position	Technique	Repetitions
1.	**Anterior Capsule Stretch**	Supine or standing, shoulder in ER and extension	Therapist-assisted stretch in external rotation	3–5
2.	**Posterior Capsule Stretch**	Supine or side-lying, shoulder in horizontal adduction	Therapist moves arm across chest (horizontal adduction)	3–5
3.	**Inferior Capsule Stretch**	Sitting or supine, shoulder in abduction	Overhead elevation or therapist-assisted arm lift upward	3–5
4.	**Cross-body Stretch (optional)**	Standing or sitting	Self-stretch by pulling arm across chest	3–5

Progression Over 4 Weeks:

- **Week 1:** Treatment begins gently to reduce pain and allow the patient to tolerate the intervention, focusing on basic mobilizations or mild stretching.
- **Week 2:** The intensity and duration of mobilizations or stretches are gradually increased to improve joint mobility.
- **Week 3:** Involves progressing to deeper mobilizations or sustained end-range stretches to address capsular tightness.
- **Week 4:** High-intensity techniques are maintained to maximize range of motion and functional recovery.

Additional Notes :

- A moist heat pack will be applied for 10–15 minutes before each session to warm up the soft tissues and enhance stretch tolerance.
- Static stretching will be performed by a trained physiotherapist, ensuring patient comfort and safety throughout the session.
- Care will be taken to avoid overstretching or causing sharp pain, especially in patients with irritable symptoms.
- A cold pack may be applied post-session in case of discomfort or to reduce inflammation.

Statistical Analysis:

Prior to inferential analysis, the distribution of data was assessed for normality using appropriate tests such as the Shapiro-Wilk test. Since the data followed a normal distribution ($p > 0.05$), parametric tests were applied for further analysis.

Statistical analysis was performed using paired t-tests for within-group comparisons and unpaired t-tests for between-group comparisons, with the level of significance set at $p < 0.05$.

RESULTS:

A total of 60 participants with adhesive capsulitis were included in the present study. All participants fulfilled the predicted inclusion and exclusion criteria and completed the assessment and were equally divided into two groups: Group A (n = 30), which received shoulder glide techniques, and Group B (n = 30), which underwent capsular stretching.

The baseline demographic characteristics indicated that both groups were comparable. The mean age of participants in Group A was 52.3 ± 4.2 years, while in Group B it was 51.8 ± 4.5 years. Gender distribution showed a higher proportion of females in both groups, with Group A consisting of 10 males and 20 females and Group B including 12 males and 18 females. There were no statistically significant differences between the groups in terms of age or gender ($p > 0.05$), confirming homogeneity at baseline.

Similarly, baseline clinical characteristics demonstrated no significant differences between the groups ($p > 0.05$).

Table 1: Demographic Characteristics of Participants

Variable	Group A (n=30)	Group B (n=30)
Age (Mean ± SD)	52.3 ± 4.2	51.8 ± 4.5
Gender (M/F)	10 / 20	12 / 18

Table 2: Within-Group Comparison for Group A (Shoulder Glides)

Variable	Pre (Mean ± SD)	Post (Mean ± SD)	Mean Difference	t-value	p-value
VAS	8.1 ± 0.8	2.9 ± 0.7	5.2	28.4	<0.001
Flexion	102.5 ± 5.8	148.6 ± 6.5	46.1	32.6	<0.001
Abduction	74.2 ± 4.6	136.5 ± 5.9	62.3	35.8	<0.001
External Rotation	25.4 ± 3.2	64.8 ± 4.1	39.4	30.2	<0.001
Internal Rotation	34.2 ± 3.8	58.6 ± 4.3	24.4	27.1	<0.001
SPADI	76.8 ± 4.5	30.5 ± 3.8	46.3	33.5	<0.001

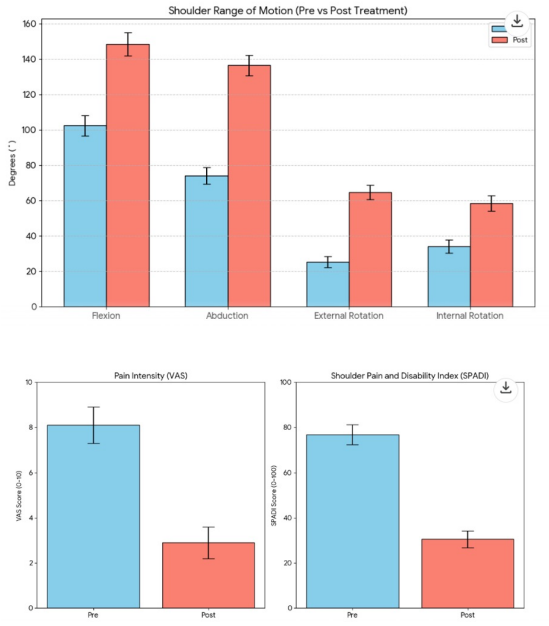
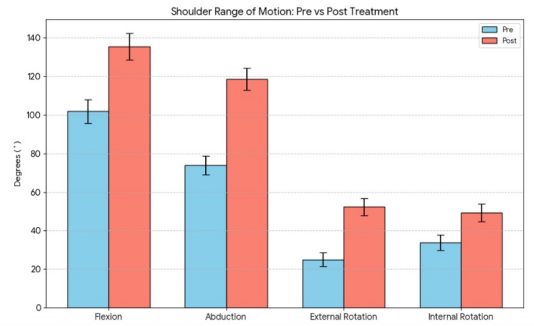
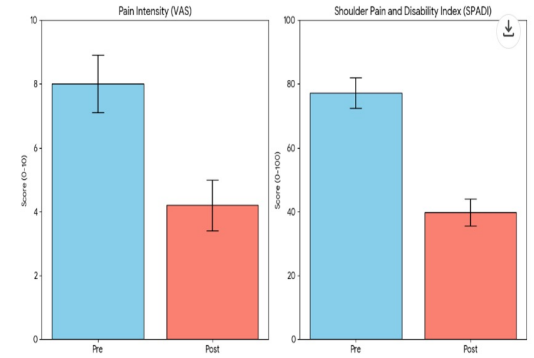


Table 3: Within-Group Comparison for Group B (Capsular Stretching)

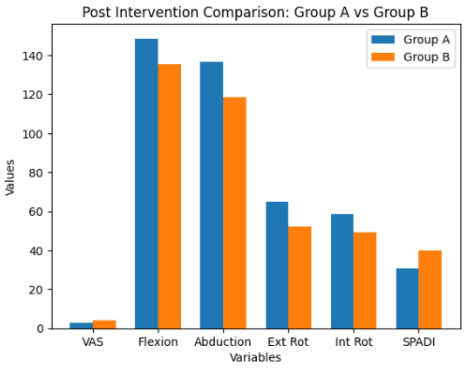


Variable	Pre (Mean ± SD)	Post (Mean ± SD)	Mean Difference	t-value	p-value
VAS	8.0 ± 0.9	4.2 ± 0.8	3.8	20.6	<0.001
Flexion	101.8 ± 6.2	135.4 ± 6.8	33.6	24.8	<0.001
Abduction	73.8 ± 4.9	118.6 ± 5.7	44.8	27.3	<0.001
External Rotation	25.1 ± 3.5	52.3 ± 4.5	27.2	23.9	<0.001
Internal Rotation	33.9 ± 4.0	49.2 ± 4.6	15.3	19.5	<0.001
SPADI	77.2 ± 4.8	39.8 ± 4.2	37.4	26.7	<0.001



Variable	Group A (Mean ± SD)	Group B (Mean ± SD)	Mean Difference	t-value	p-value
VAS Post	2.9 ± 0.7	4.2 ± 0.8	1.3	6.85	<0.001
Flexion Post	148.6 ± 6.5	135.4 ± 6.8	13.2	7.62	<0.001
Abduction Post	136.5 ± 5.9	118.6 ± 5.7	17.9	9.14	<0.001
External Rotation Post	64.8 ± 4.1	52.3 ± 4.5	12.5	8.36	<0.001
Internal Rotation Post	58.6 ± 4.3	49.2 ± 4.6	9.4	7.21	<0.001
SPADI Post	30.5 ± 3.8	39.8 ± 4.2	9.3	8.08	<0.001

Table 4: Between-Group Comparison (Post Values)



DISCUSSION:

The present study was conducted to compare the effectiveness of shoulder glides and capsular stretching in improving pain, range of motion (ROM), and functional disability in individuals with adhesive capsulitis. The findings revealed that both interventions were effective in improving clinical outcomes; however, shoulder glides demonstrated significantly superior results compared to capsular stretching.

In the present study, Group A which received shoulder glide mobilization, demonstrated highly significant improvements in pain, ROM, and SPADI scores ($p < 0.001$). The reduction in pain observed in this group can be explained by the neurophysiological effects of joint mobilization. According to the gate control theory, stimulation of mechanoreceptors during mobilization inhibits the transmission of nociceptive signals, thereby reducing pain perception.

Furthermore, joint mobilization enhances synovial fluid movement, reduces joint stiffness, and improves tissue extensibility. These effects contribute to the restoration of normal arthrokinematics, which is essential for achieving functional ROM. The improvement in ROM, particularly in abduction and external rotation, can be attributed to the correction of capsular restrictions through targeted accessory movements.

These findings are consistent with previous studies. Vermeulen et al. reported that high-grade mobilization techniques resulted in significant improvements in shoulder mobility and functional outcomes.

The significant reduction in SPADI scores observed in Group A indicates improved functional ability. This improvement is likely due to the combined effect of pain reduction and increased ROM, enabling patients to perform daily activities more efficiently.

Group B, which received capsular stretching, also demonstrated statistically significant improvements in all outcome measures ($p < 0.001$). Capsular stretching works by elongating shortened collagen fibers and improving the flexibility of the joint capsule (30,31). This results in reduced stiffness and enhanced mobility.

The reduction in pain observed in this group may be attributed to decreased muscle tension and improved local circulation. Stretching also helps in breaking adhesions and restoring tissue extensibility, thereby facilitating movement.

The between-group comparison further confirmed that shoulder glides were significantly more effective than capsular stretching in improving pain, ROM, and functional outcomes ($p < 0.001$). The superior effectiveness of mobilization can be attributed to its direct impact on joint capsule stiffness and its ability to restore joint play movements.

These findings are supported by Kisner and Colby, who emphasized that joint mobilization is particularly effective in conditions involving capsular tightness (12). Additionally, Manheim highlighted the importance of accessory joint movements in achieving full ROM and functional recovery.

CONCLUSION:

The present study concludes that both shoulder glides and capsular stretching are effective in the management of adhesive capsulitis. However, shoulder glides demonstrated **significantly superior outcomes** in reducing pain, improving range of motion, and enhancing functional ability. These findings support the use of joint mobilization as a **preferred intervention** in clinical practice.

LIMITATION OF THE STUDY:

- Small sample size
- Short duration of study
- No long term follow-up
- Limited outcome measures
- No control group

RECOMMENDATION:

Further study could be performed with

- Large number of samples
- Duration of study for long period
- Different stages of the selected condition
- Different condition may be selected
- Age group could be extended.

REFERENCES:

1. Kelley MJ, McClure PW, Leggin BG. Shoulder pain and mobility deficits: adhesive capsulitis. J Orthop Sports Phys Ther. 2009;39(5):A1–A38.
2. Neviaser AS, Hannafin JA. Adhesive capsulitis: a review of current treatment. Am J Sports Med. 2010;38(11):2346–56.
3. Zuckerman JD, Rokito A. Frozen shoulder: a consensus definition. J Shoulder Elbow Surg. 2011;20(2):322–5.
4. Hand C, Clipsham K, Rees JL, Carr AJ. Long-term outcome of frozen shoulder. J Shoulder Elbow Surg. 2008;17(2):231–6.
5. Hsu JE, Anakwenze OA, Warrender WJ, Abboud JA. Current review of adhesive capsulitis. J Shoulder Elbow Surg. 2011;20(3):502–14.
6. Dias R, Cutts S, Massoud S. Frozen shoulder. BMJ. 2005;331(7530):1453–6.
7. Shaffer B, Tibone JE, Kerlan RK. Frozen shoulder: a long-term follow-up. J Bone Joint Surg Am. 1992;74(5):738–46.
8. Wang K, Ho V, Hunter-Smith DJ, Beh PS, Smith KM, Weber AB. Risk factors in adhesive capsulitis. Clin Orthop Relat Res. 2013;471(7):2133–9.
9. Bridgman JF. Periarthritis of the shoulder and diabetes mellitus. Ann Rheum Dis. 1972;31(1):69–71.
10. Reeves B. The natural history of the frozen shoulder syndrome. Scand J Rheumatol. 1975;4(4):193–6.
11. Hannafin JA, Chiaia TA. Adhesive capsulitis: a treatment approach. Clin Orthop Relat Res. 2000;(372):95–109.
12. Kisner C, Colby LA. Therapeutic Exercise: Foundations and Techniques. 6th ed. Philadelphia: F.A. Davis; 2012.
13. Hand GC, Athanasou NA, Matthews T, Carr AJ. The pathology of frozen shoulder. J Bone Joint Surg Br. 2007;89(7):928–32.
14. Bunker TD. Frozen shoulder: unravelling the enigma. J Bone Joint Surg Br. 1995;77(5):677–83.
15. Lundberg BJ. The frozen shoulder. Acta Orthop Scand. 1969;40(Suppl 119):1–59.
16. Cyriax J. Textbook of Orthopaedic Medicine. 8th ed. London: Baillière Tindall; 1982.

17. Diercks RL, Stevens M. Gentle thawing of the frozen shoulder. J Shoulder Elbow Surg. 2004;13(5):499–502.
18. Diercks RL, Stevens M. Frozen shoulder: conservative treatment outcomes. J Shoulder Elbow Surg. 2004;13(5):499–502.
19. Chan HB, Pua PY, How CH. Physical therapy in adhesive capsulitis. Singapore Med J. 2017;58(12):685–9.
20. Maitland GD. Peripheral Manipulation. 4th ed. Oxford: Butterworth-Heinemann; 1991.
21. Maitland GD. Vertebral Manipulation. 5th ed. London: Butterworths; 1986.
22. Mulligan BR. Manual Therapy: NAGS, SNAGS, MWMS. Wellington: Plane View Services; 1999.
23. Kaltenborn FM. Manual Mobilization of the Extremity Joints. 5th ed. Oslo: Olaf Norlis Bokhandel; 1985.