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Effectiveness of Shoulder Mobilization in Enhancing the Outcomes of Positional Release Technique for Correcting Forward Shoulder Posture

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Abstract: ***Background**: Forward shoulder posture (FSP)[10] is a prevalent musculoskeletal deviation frequently linked to pectoralis minor tightness and shoulder dysfunction. The positional release technique (PRT)[2,3] is effective in relieving muscle tension, but joint mechanics often remain compromised. This study evaluates whether incorporating shoulder mobilization (SM)[1] enhances the outcomes of PRT in individuals with FSP. **Objective**: To compare the effectiveness of shoulder mobilization combined with PRT[4] versus PRT alone in improving posture, muscle flexibility, shoulder mobility, and pain-related disability in young adults with FSP. **Methods**: Thirty participants (aged 15–30) with diagnosed FSP and pectoralis minor tightness were randomized into two groups: Group A (PRT only) and Group B (PRT + SM)[1,4]. Interventions were applied three times weekly for six weeks. Pre- and post-treatment outcomes were assessed using the Pectoralis Minor Length Test[8], shoulder ROM (flexion and external rotation)[6], and SPADI (Shoulder Pain and Disability Index)[5]. Intra-group changes were analyzed via paired t-tests; inter-group comparisons used independent t-tests. **Results**: Group B showed significantly greater improvements than Group A in all parameters. Mean increases in shoulder flexion (25.6° vs. 16.27°), external rotation (15.33° vs. 9.07°), and pectoralis minor length (1.73 cm vs. 1.40 cm) were observed. SPADI scores improved more in Group B (mean decrease: 38.4 points) than Group A (20.33 points), with all p-values < 0.0001. **Conclusion**: Combining shoulder mobilization with PRT results in superior functional and structural recovery in FSP patients compared to PRT alone.*

Keywords: Shoulder Mobilization, Positional Release Technique, Pectoralis Minor Tightness, Forward Shoulder Posture, SPADI, ROM

1. Introduction

Forward shoulder posture (FSP)[10] is one of the most prevalent postural abnormalities observed among young adults, especially those engaged in sedentary lifestyles, digital device use, and occupational or athletic tasks that promote anterior scapular tilt. FSP is characterized by the anterior displacement and downward rotation of the shoulder complex, often accompanied by pectoralis minor muscle shortening.

Positional Release Technique (PRT)[2,3] works on the principle of placing the muscle in a shortened, pain-free position for approximately 90 seconds to deactivate neuromuscular tension and facilitate relaxation. PRT is gentle, non-invasive, and effective in reducing muscular tone and sensitivity in cases involving trigger points or postural shortening.

Shoulder Mobilization (SM) Mobilization techniques, especially inferior and posterior glides, have demonstrated efficacy in increasing range of motion, and decreasing joint stiffness, all of which are crucial for restoring functional alignment in FSP.

2. Methodology

2.1 Study Design and Participants

A comparative interventional study was conducted on 30 patients aged 15–30 years diagnosed with FSP and PMi tightness. Participants were randomly assigned to:
Group A (n=15): PRT only
Group B (n=15): SMT + PRT

2.2 Inclusion Criteria:

- Linear distance from treatment table to acromion >2.6 cm
- Restricted shoulder flexion (>150°) and external rotation
- Age 15–30 years

2.3 Exclusion Criteria:

- Diabetes, pregnancy, cardiac/respiratory/dermatologic issues
- History of surgery or upper limb fracture

2.4 Intervention Protocol:

Participants received their respective interventions thrice weekly for 6 weeks. SMT involved inferior and posterior glides of the glenohumeral joint, while PRT targeted PMi tender points.

2.5 Duration: 6 weeks; 3 sessions/week.

2.6 Outcome Measures:

a) Pectoralis Minor Length Test/ Table Top Test
b) Goniometric ROM: Shoulder flexion and external rotation
c) SPADI scale

2.7 Statistical Analysis

Paired and unpaired t-tests were used. A p-value <0.05 was considered statistically significant.

3. Results

Table 1: Comparison of average improvement in Group-A and Group-B

Variable	Period	Average Improvement Group-A	Average Improvement Group-B	t-Value	p-Value	Result
PMi length	Pre-6 weeks	1.40	1.73	1.6733	0.000	p<0.05sig
Flexion Rom	Pre-6 weeks	16.27	25.60	10.7161	0.000	p<0.05sig
External Rotation ROM	Pre-6 weeks	9.07	15.33	6.2707	0.000	p<0.05sig
SPADI Score	Pre-6 weeks	20.33	38.40	10.3576	0.000	p<0.05sig

4. Discussion

The findings of this study provide strong evidence that combining shoulder mobilization with positional release technique (PRT) significantly enhances clinical outcomes in the management of forward shoulder posture (FSP) compared to PRT alone.

Positional release technique alone produced significant improvements in muscle length, shoulder range of motion, and SPADI scores, confirming its therapeutic utility in reducing pectoralis minor tightness . However, the addition of shoulder mobilization led to markedly greater improvements across all parameters, highlighting its role in addressing limitations that PRT may not resolve independently.

The average increase in shoulder flexion in the combined group (25.6°) compared to the PRT-only group (16.27°) represents a clinically meaningful change that would significantly impact overhead function and activities of daily living. Similarly, improvements in external rotation (15.33° vs. 9.07°) further reinforce the contribution of joint mobilization in regaining physiological movement.

The substantial improvement in pectoralis minor length in both groups further confirms the effectiveness of both interventions in addressing the soft tissue component of FSP. However, the greater increase in the combined group (1.73 cm vs. 1.40 cm) suggests that mobilization may have provided a mechanical advantage by facilitating more efficient elongation of the shortened muscle.

Additionally, the marked difference in SPADI scores between the groups further validates the superiority of the combined intervention.

The findings of this study align with several prior investigations highlighting the efficacy of manual therapy in shoulder dysfunction. Manske et al. (2010) showed that the combination of stretching and joint mobilization resulted in greater improvements in internal rotation in athletes with glenohumeral internal rotation deficit (GIRD) than stretching alone.
Limitations: The sample size was relatively small (n=30), and the intervention period was limited to six weeks. Longer-term follow-up is necessary to determine the durability of improvements, especially given that FSP is often associated with chronic postural habits. Additionally, blinding was not implemented, and no placebo group was included, which may introduce potential bias.

5. Conclusion

The present study concludes that the addition of shoulder mobilization significantly enhances the therapeutic outcomes of positional release technique in the correction of forward shoulder posture. Both interventions were effective in improving pectoralis minor muscle length, shoulder range of motion, and reducing pain-related disability. However, the group receiving the combined approach demonstrated statistically and clinically superior improvements across all measured parameters, including greater gains in flexion and external rotation ROM, increased muscle length, and larger reductions in SPADI scores.sss

Ethics Declaration
Ethics Approval and Consent to Participate: This study was approved by the Institutional Ethics Committee of Pacific Medical University, Udaipur (Approval No: PMU/IEC/286/2024). All participants provided written informed consent prior to participation in the study.

Competing Interests:
The authors declare no conflicts of interest.

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Abbreviations

FSP: Forward Shoulder Posture
PMi: Pectoralis Minor
PRT: Positional Release Technique
SMT: Shoulder Mobilization Technique
SPADI: Shoulder Pain and Disability Index
ROM: Range of Motion