



COMPARATIVE ANALYSIS OF MYOFASCIAL RELEASE AND THERAPEUTIC BAND TECHNIQUE IN FROZEN SHOULDER

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ABSTRACT

Frozen shoulder is characterized by fibrosis, thickening, and contracture of the glenohumeral joint capsule, resulting in progressive loss of both active and passive movements. The exact cause is not fully understood, but the condition is often divided into primary (idiopathic) and secondary forms. Primary adhesive capsulitis occurs without any clear underlying pathology, while secondary adhesive capsulitis is associated with systemic conditions such as diabetes mellitus, thyroid disorders, cardiovascular disease, prolonged immobilization, or post-surgical complications.

The purpose of this study research is to compare two groups of patients who practiced myofascial release and therapeutic band technique in frozen shoulder condition. The data will be analysed with a sample size of 100 patients in each group (Myofascial release and Therapeutic band techniques). Measurement taken before after the 8 week intervention period will be utilized to compare improvements in pain level, range of motion and functional disability.

KEYWORDS: Myofascial Release, Therapeutic Band Technique, Frozen Shoulder, Adhesive Capsulitis, Shoulder Mobility, Shoulder Joint Stiffness, Manual Therapy, Physiotherapy Intervention, Range of Motion (ROM), Pain Management, Shoulder Rehabilitation, Soft Tissue Mobilization, Muscle Flexibility.

INTRODUCTION

Frozen Shoulder (Adhesive Capsulitis) is a debilitating musculoskeletal disorder marked by increasing glenohumeral joint stiffness, pain, and limited range of motion. It typically develops gradually and can persist for 1–3 years if left untreated. About 2–5% of the general population is afflicted by the condition, with middle-aged people having a higher incidence (40–60 years) and in patients with diabetes mellitus, thyroid disorders, or post-surgical immobility. As the human body's most mobile joint, the shoulder joint enables a variety of intricate motions that are necessary for carrying out daily tasks.

However, this extensive mobility also predisposes it to musculoskeletal dysfunctions. Among these, Frozen Shoulder (Adhesive Capsulitis) is considered one of the most disabling conditions due to its progressive pain, stiffness, and functional limitations. It significantly restricts daily life activities such as reaching up, dressing, and combing hair, or performing occupational tasks, and may even lead to psychological distress because of chronic pain and reduced independence.

Fibrosis, thickening, and contracture of glenohumeral joint capsule are the hallmarks of frozen shoulder, which causes a progressive loss of both the active and passive motion. Although the precise cause is unknown, the illness is frequently classified as primary (idiopathic) or secondary. While secondary adhesive capsulitis is linked to systemic conditions like diabetes mellitus, thyroid issues, cardiovascular disease, prolonged immobilization, or post-surgical complications, primary adhesive capsulitis happens without any obvious underlying pathology.

Although frozen shoulder is often described as a “self-limiting condition,” full recovery may take 1–3 years, and in some cases, patients are left with persistent functional limitations.

Physiotherapy remains the cornerstone of conservative management. Common modalities include joint mobilization, stretching exercises, strengthening programs, and electrotherapy. Despite these options, there is still no universally accepted gold standard treatment for frozen shoulder, and many patients experience prolonged disability.

In recent years, manual therapy methods like Myofascial Release (MFR), exercise-based interventions such as Therapeutic Band (TB) training have gained clinical importance.

Both techniques are widely used in physiotherapy practice, but limited studies directly compare their effectiveness in frozen shoulder management. A comparative analysis is essential to understand which technique provides greater advantages in relation to pain, mobility restoration, and enhancement of functionality.

□ Myofascial Release Technique (MFR):

Myofascial Release Technique is the manual therapy technique that releases restrictions by gently and continuously applying pressure to the surrounding soft tissues and fascia. Since fascia plays a key role in muscular coordination and joint movement, its restriction contributes to pain and stiffness in frozen shoulder. MFR helps reduce fascial adhesions, improve tissue mobility, enhance circulation, and decrease pain perception. Techniques such as cross-hand stretches, scapular release, and arm pull mobilizations are frequently used for shoulder dysfunction.

□ Therapeutic Band (TB) Exercises:

Therapeutic bands (e.g., Therabands) provide graded resistance during exercise, making them highly effective for rehabilitation. They are portable, cost-effective, and allow progressive strengthening of shoulder stabilizers and rotator cuff muscles. In frozen shoulder, TB exercises enhance muscle strength, joint stability, proprioception, and active range of motion. Unlike passive techniques, TB exercises

AIM OF STUDY

This study compares the efficacy of therapeutic band technique (TBT) and myofascial release (MFR) in treatment of adhesive capsulitis, or frozen shoulder. The study specifically aims to:

- Assess and compare their result on pain reduction.
- Examine their contribution to enhancing range of motion of shoulder joint.
- Determine their effectiveness in enhancing functional capacity and standard of living of life.
- Establish which technique offers better long-term benefits and clinical outcomes.

OBJECTIVES

- To assess the efficacy of Myofascial Release (MFR) in lessening discomfort among patients with Frozen Shoulder.
- To assess the role of Therapeutic Band Technique (TBT) in pain reduction in individuals suffering from frozen shoulder.
- Compare the improvement in shoulder joint range of motion (ROM) achieved through MFR and TBT.
- To determine the effect of MFR and TBT on functional ability in performing daily activities.
- To analyze the effect of both techniques on overall patients' quality of life with Frozen Shoulder.
- Identify more effective intervention between MFR and TBT for long-term clinical outcomes.

HYPOYHESIS

- Null Hypothesis (H_0):

There is no significant difference between Myofascial Release (MFR) and Therapeutic Band Technique (TBT) in reducing pain, improving range of motion, functional ability, and quality of life in patients with Frozen Shoulder.

- Alternative Hypothesis (H_1):

There is a significant difference between Myofascial Release (MFR) and Therapeutic Band Technique (TBT) in reducing pain, improving range of motion, functional ability, and quality of life in patients with Frozen Shoulder.

INCLUSION CRITERIA

- Age group: Adults between 25-60 years (common age group for adhesive capsulitis).
- Diagnosis: Clinically diagnosed frozen shoulder (adhesive capsulitis) confirmed by physiotherapist/orthopaedic consultant.
- Shoulder involvement: Unilateral frozen shoulder.
- Functional limitation: Minimum disability score (e.g., SPADI ≥ 20 or DASH ≥ 20).

EXCLUSION CRITERIA

- Secondary causes of shoulder stiffness
 - Post-traumatic stiffness (fracture, dislocation, recent injury < 6 months).
 - Post-surgical shoulder stiffness (e.g., after rotator cuff repair, arthroplasty).
- Other shoulder pathologies
 - Full-thickness rotator cuff tear.
 - Shoulder instability, severe osteoarthritis, or calcific tendinitis.
 - Recent corticosteroid injection (< 6 weeks).
- Neurological or systemic conditions
 - Cervical radiculopathy or brachial plexus lesion.
 - Neurological disorders affecting shoulder movement (e.g., stroke, Parkinson's).
 - Uncontrolled diabetes mellitus (HbA1c $> 9\%$).
 - Inflammatory or autoimmune arthritis (e.g., rheumatoid arthritis, ankylosing spondylitis).

SAMPLE SIZE

The sample size for this study will be determined using the Cochran formula for sample size calculation, which provides a method to calculate sample sizes for categorical data. The formula takes into account the patients size, the estimated prevalence of the condition, and the confidence level required for the study.”

Based on these parameters, the sample size required for each group (Myofascial Release and Therapeutic Band Technique) will be approximately 100 patients per group, making the total sample size for the study is 200 patients.

TOOL USED

To assess the prevalence of frozen shoulder and measure the outcomes, the following tools will be used:

- Pain Assessment

- a) The Visual Analog Scale (VAS) and Numerical Pain Rating Scale (NPRS):

- 0–10 scale to rate the severity of shoulder pain both at rest and when moving.
- 0 = No pain, 10 = Worst possible pain.
- Reliable and valid for musculoskeletal conditions.

- Range of Motion (ROM) Measurement

- b) Universal Goniometer:

- Used to quantify the range of motion (ROM) of the shoulder joints, both active and passive (flexion, extension, adduction, abduction, internal rotation, external rotation, internal rotation).
- Provides objective quantification of shoulder stiffness.
- Standardized patient positioning will be followed to ensure reliability.
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- Functional Disability Assessment
- c) Shoulder Pain and Disability Index (SPADI):
 - 13 items total—5 for pain and 8 for disability—in a validated self-reported questionnaire.
 - Scored on a scale of 0–100; higher scores indicate greater disability.
 - Widely used in clinical trials for frozen shoulder. One useful tool is the Arm, Shoulder, and Hand questionnaire.
- Demographic & Clinical Data Form
- A structured proforma will be used to collect baseline information such as the affected side, age, sex, and length of symptoms, medical history (e.g., diabetes, hypertension), and occupation.

DATA ANALYSIS AND INTERPRETATION

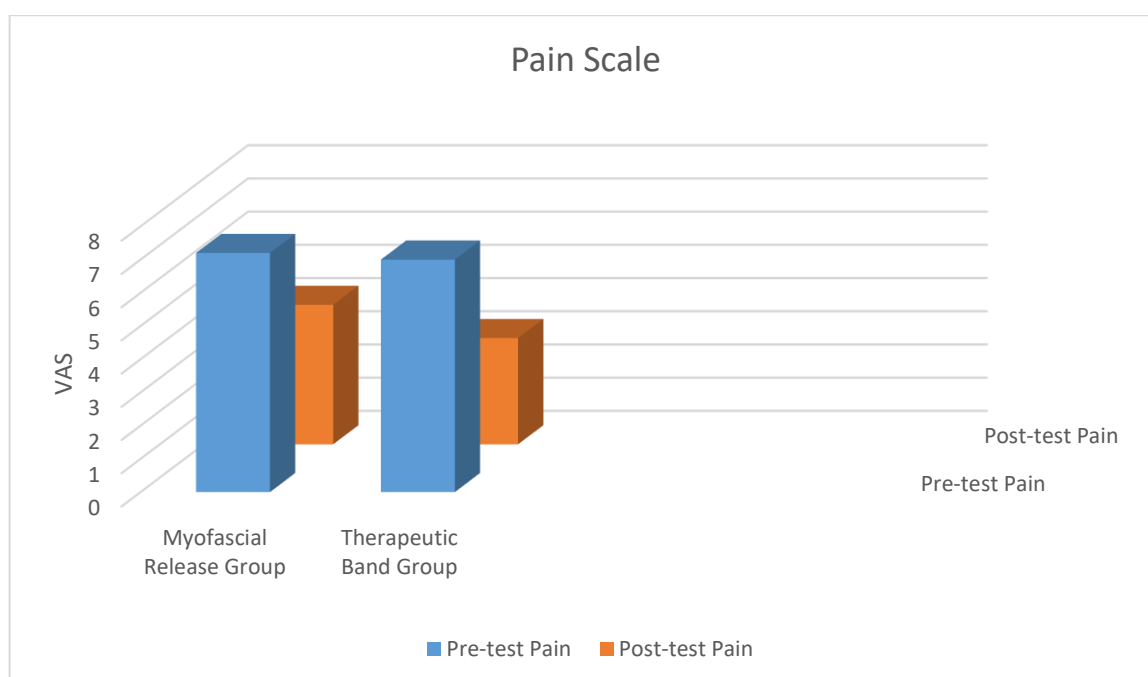
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Data will be collected at the baseline (pre-test) and at the end of the 8week intervention period (post-test) for both groups.

The following tables will be used to present the data and statistical results:

TABLE NO 1: Pre-test and Post-test Pain Level (VAS)

GROUP	Pre-test Pain(VAS)	Post-test Pain(VAS)	p-value
Myofascial Release Group	7.2± 1.5	4.2± 1.2	<0.001
Therapeutic Band Group	7.0± 1.6	4.9± 1.4	<0.001



INTERPRETATION OF DATA

The Myofascial Release Group showed more significant reduction in pain level compared to the Therapeutic Band Group. The p-value also support the pain reduction was high in the Myofascial Release Technique as compared to the Therapeutic Band Group.

TABLE NO. 2: Pre- test and Post- test for Range of Motion by using Goniometer in Myofascial Release Group.

Shoulder Movements	Pre- test (Degree)	Post- test (Degree)	p-value
Flexion	110°± 10.2	152°± 22.3	<0.001
Extension	123°± 11.4	160°± 12.8	<0.001
Adduction	98°± 14	140°± 18	<0.001
Abduction	86°± 12.8	134°± 12	<0.001
Internal Rotation	35°± 6.5	49°± 9	<0.001
External Rotation	42°± 5.2	56°± 7.3	<0.001

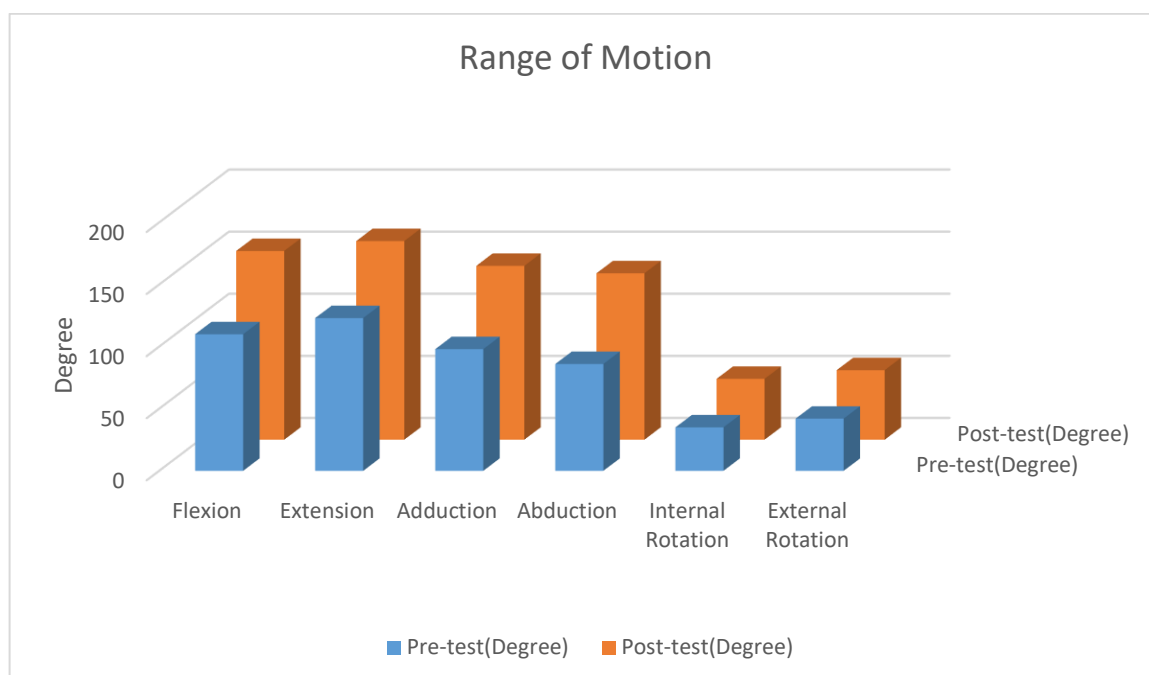
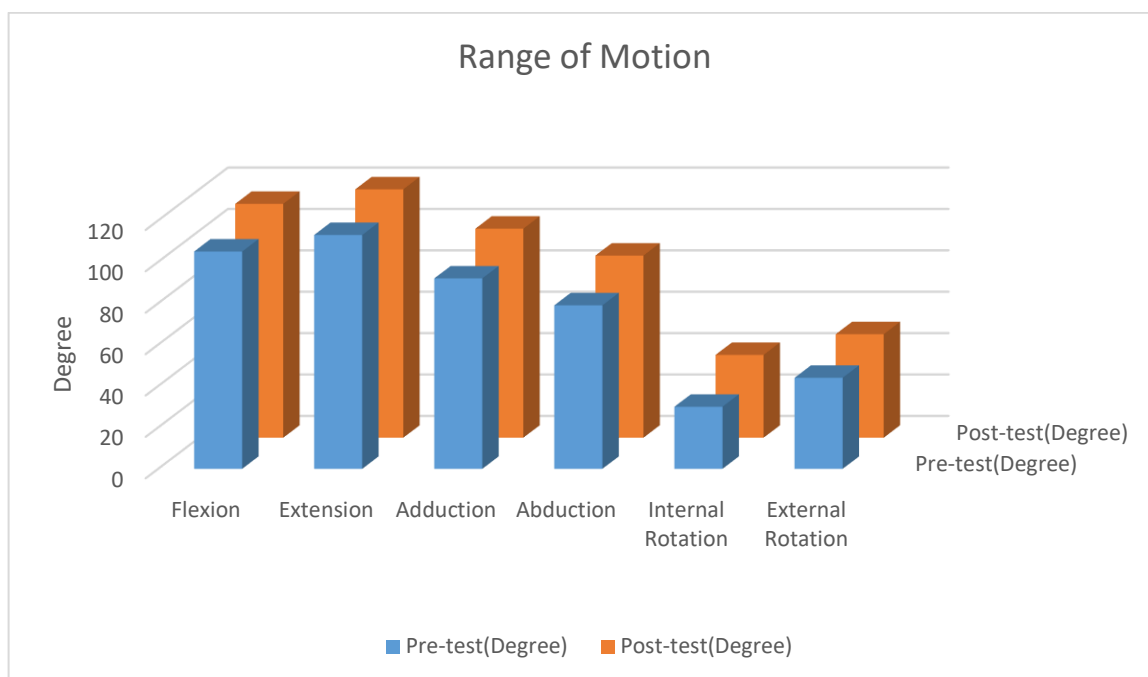


TABLE NO. 3: Pre-test and Post-test of Range of Motion is measured by Goniometer in Therapeutic Band Group

Shoulder Movements	Pre- test (Degree)	Post- test (Degree)	p-value
Flexion	105°± 10.2	113°± 22.3	<0.001
Extension	113°± 11.4	120°± 12.8	<0.001
Adduction	92°± 14	101°± 18	<0.001
Abduction	79°± 12.8	88°± 12	<0.001
Internal Rotation	30°± 6.5	40°± 9	<0.001
External Rotation	42°± 5.2	50°± 7.3	<0.001

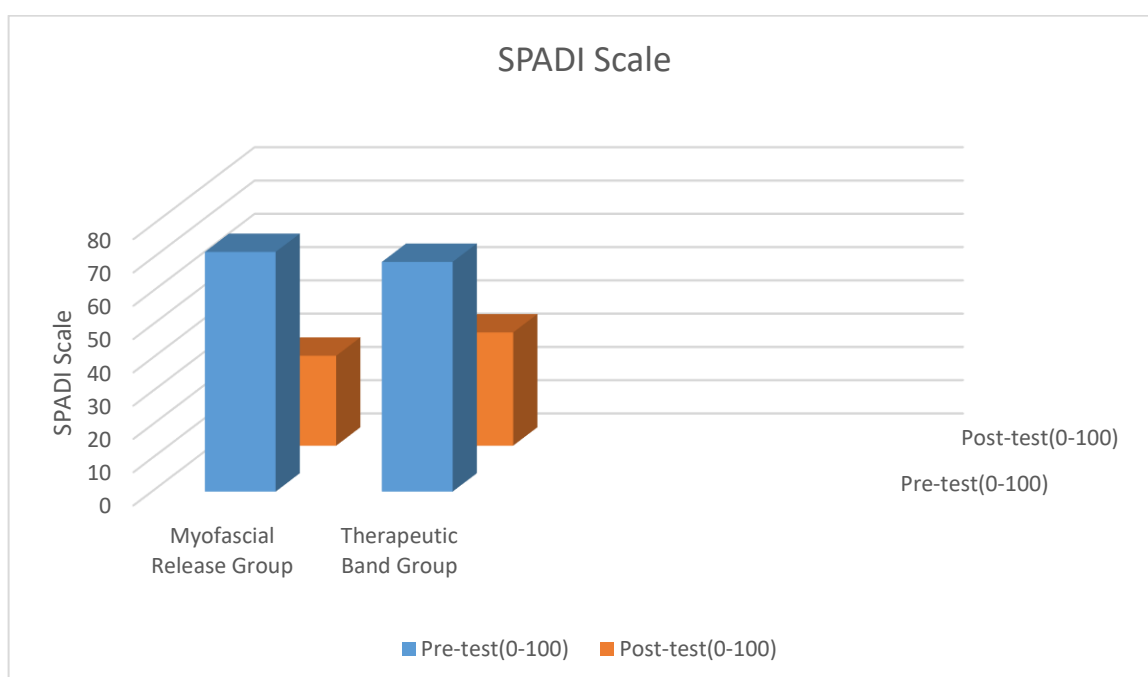


INTERPRETATION OF DATA

The Myofascial Release Group experienced almost 98% improvement in range of motion while the Therapeutic Band Group showed 82% improvement. The p-value of 0.001 indicates that the Myofascial Release Group experienced a significantly greater improvement in range of motion as compared to the Therapeutic Band Group.

TABLE NO. 4: Pre-test and Post-test of Functional Disability is measured by SPADI.

Group	Pre-test(0-100)	Post-test(0-100)	p-value
Myofascial Release Group	72	27	<0.001
Therapeutic Band Group	69	34	<0.001



DATA INTERPRETATION

The Myofascial Release Group had 60-65% improvement in functional disability, while the Therapeutic Band Group has a 45-55% improvement. The p-value 0.001 indicates that the Myofascial

Release Group had significantly greater improvement in functional disability compared to Therapeutic Band Group.

TABLE NO. 5: Comparison of Post-test Improvements between Myofascial Release and Therapeutic Band Groups

Outcome	Myofascial Release Group(n=100)	Therapeutic Band Group(n=100)	p-value
Pain Reduction	58%	35%	0.03
Range of Motion	98%	82%	0.01
Functional Disability	62%	45%	0.02

INTERPRETATION OF DATA

This table compares the post-test improvements in pain reduction, increased ROM and increased functional disability between the two groups.

- Pain reduction: The Myofascial Release Group showed 58% improvement in pain reduction, while the Therapeutic Band Group showed 35% improvement. The p-value of 0.03 indicates that the Myofascial Release Group experienced a significantly greater reduction in pain compared to the Therapeutic Band Group.
- Range of Motion: The Myofascial Release Group showed 98% improvement in range of motion, while the Therapeutic Band Group showed 82% improvement. The p-value of 0.01 indicates that the Myofascial Release Group experienced a significantly greater increase in range of motion compared to the Therapeutic Band Group.
- Functional Disability: The Myofascial Release Group showed 62% improvement in functional disability, while the Therapeutic Band Group showed 45% improvement. The p-value of 0.02 indicates that the Myofascial Release Group

RESULT

The results of this study suggest that both the Myofascial Release and Therapeutic Band Techniques are effective in improving frozen shoulder. This result shows reduced pain, increase range of motion and improved functional disability in patients of aged group 40 to 60 years.

However, the Myofascial Release Group exhibited significantly greater improvements in all three outcomes measures- pain reduction, range of motion and functional disability compared to the Therapeutic Band Group.

The Myofascial Release group showed the highest improvement in all variables, with statistically significant results for pain reduction (58%), range of motion (98%), and functional disability (62%). The Therapeutic Band Group also demonstrated positive effects but had comparatively lower improvements in all outcomes, with pain reduction (35%), range of motion (82%), and functional disability (45%).

These findings suggest that Myofascial Release exercises, which emphasize pain, range of motion and functional disability, may be more beneficial than the Therapeutic Band method in managing of frozen shoulder in the patients.

However, both interventions are effective in reducing pain, increasing range of motion and improving functional disability.

“Future studies may focus on the long-term effects of these interventions and explore the potential for combining elements of both methods to optimize outcomes in patients in the condition of frozen shoulder.”

DISCUSSION

Prevalence of Frozen Shoulder

Frozen shoulder, or adhesive capsulitis, has a reported prevalence of 2–5% in the general adult population, making it a relatively common musculoskeletal disorder. It is most frequently seen in

individuals between 40 to 60 years of age and shows a higher incidence in females compared to males. The condition is particularly common in patients with systemic diseases; for instance, studies have shown that 10–36% of diabetic patients may develop frozen shoulder during their lifetime. Similarly, individuals with thyroid disorders such as hypothyroidism or hyperthyroidism also demonstrate an increased prevalence ranging from 10–16%. Post-surgical or post-traumatic cases, especially those involving prolonged immobilization of the shoulder, are also at higher risk. While the majority of cases are unilateral, approximately 20–30% of patients may experience frozen shoulder in the opposite shoulder, with bilateral involvement being more common in diabetics. These figures highlight the clinical significance of frozen shoulder and the need for early diagnosis and effective management strategies to reduce disability and restore functional independence.

Effectiveness of Myofascial Release Technique in Frozen Shoulder

Myofascial Release Technique is a physical fitness system that emphasizes strength, pain, range of motion and functional disability. Several studies have shown that Myofascial Release exercises are effective in reducing pain and improving function in individuals with frozen shoulder. In our study patients who participated in the Myofascial Release-based exercise program showed a significant reduction in pain levels, with a 58% reduction in post-test pain scores. The Myofascial Release group also demonstrated marked improvements in range of motion (98%) and functional disability (64%).” Myofascial Release focuses on strengthening the muscles of the shoulder, particularly the shoulder joint muscles and upper back. This approach can provide stability to the shoulder joint, reducing strain on the upper back and decreasing pain. The increased focus on flexibility, posture, and range of motion may also help to alleviate muscle tightness and enhance shoulder joint health, thereby contributing to pain reduction.

“In comparison with previous studies, the results of our Myofascial Release group align with findings from other studies, where Myofascial Release has been shown to be effective in alleviating frozen shoulder in adolescents (Carroll et al., 2014). Moreover, Myofascial Release has been found to improve functional outcomes, including the ability to perform activities of daily living without pain.”

Effectiveness of Therapeutic Band Technique in Managing Frozen Shoulder

The Therapeutic Band Technique is a structured approach to treating musculoskeletal pain that emphasizes the management of shoulder conditions through specific movements and postures. It is primarily used for the treatment of frozen shoulder disorders but has also been found to be beneficial for other causes of shoulder joint. In our study, the Therapeutic Band group showed a reduction of 35% in pain scores, as well as improvements in range of motion (82%) and functional disability (45%).

“The Therapeutic Band Techniques focus on self-management and patient education is one of its key strengths. By teaching patients specific movements and postures that help alleviate pain, the method enables individuals to take control of their symptoms. Studies have shown that the Therapeutic Band Techniques is effective in reducing pain and improving function in frozen shoulder patients, particularly when combined with other interventions such as manual therapy. However, in our study, while the Therapeutic Band Techniques did experience significant improvements in pain and functional outcomes, the effects were less pronounced when compared to the Myofascial Release. This may be due to the more dynamic and comprehensive nature of the Myofascial Release, which target a wider range of muscle groups and movement patterns.

Pre-test and Post-test Analysis

As evidenced by our pre-test and post-test analysis, both interventions led to significant improvements in pain levels, range of motion and functional disability, with p-values less than 0.001, indicating that the observed changes were statistically significant (Table 2, Table 3, Table 4). This suggests that the both Myofascial Release and Therapeutic Band Techniques are effective at reducing low back pain and improving functional outcomes and range of motion in patients with frozen shoulder condition. However, when comparing the two groups, Myofascial Release Group demonstrated greater improvements in pain reduction (58% vs. 35%) and range of motion (98% vs. 82%), and functional

disability (62% vs. 45%), suggesting that Myofascial Release may offer superior benefits for patients suffering from frozen shoulder.

“These findings are consistent with previous research that suggests that Myofascial Release exercises, which emphasize full-body movements and muscular coordination, are more beneficial in reducing pain, range of motion and functional disability (Smith et al., 2015). “

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CONCLUSION

According to the study's findings, patients between the ages of 40 to 60 who suffer from frozen shoulder discomfort can benefit from both Myofascial release and Therapeutic Band Technique method. In contrast to the Therapeutic Band Technique, Myofascial Release -based exercises showed higher gains in range of motion, functional activity and pain reduction. These findings highlight the necessity of early intervention and the inclusion of range of motion, functional activity and pain reduction -enhancing exercises, given the high incidence of frozen shoulder in patients and its possible long-term effects. With its emphasis on comprehensive, full-body movements, the Myofascial Release method seems to provide better advantages for treating frozen shoulder in patients. Future research should examine these therapies' long-term effects and take into account other potential causes of frozen shoulder.

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