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Effectiveness of Maitland's Mobilization Versus Sleepers Stretch and Posterior Capsule Stretch on Pain, Rom and Shoulder Functions in Patients with Adhesive Capsulitis: A Randomized Control Trial

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Abstract:

- ***Background and Objectives:***

Adhesive capsulitis (AC) is a pathological condition of shoulder joint characterized by excessive scar tissue or adhesion formation all across the glenohumeral joint. It is typically marked by a sudden onset of pain and a progressive loss of glenohumeral joint motion, which causes a severe loss of shoulder function. There is a high prevalence in the age group between 40 to 60 years of age. As Compared to men, women are 4 times more likely to be affected by frozen shoulder. AC results in discomfort, pain, stiffness and dysfunction .The study was done to assess the effectiveness of Maitland mobilization vs sleepers and posterior capsule stretch on pain, ROM and shoulder function in patients with adhesive capsulitis.

- ***Methods:***

According to the sample size estimation the study included 60 participants. All the subjects included were clinically diagnosed by an orthopedic with adhesive capsulitis were screened after finding their suitability as per the inclusion criteria. Participants were briefed about the study and informed consent was obtained for the same. Total of 60 participants were randomly assigned into 2 treatment groups with 30 participants each. Group 1 (n=30) was given Maitland mobilization along with conventional physiotherapy whereas, group 2 (n=30) was followed by vs sleepers and posterior capsule stretch along with conventional physiotherapy protocol. The total duration of treatment was 4 weeks. Pre and post intervention scores were measured in terms of VAS, ROM, and SPADI.

- ***Outcome Measures:***

Pre and post intervention scores were measured in terms of VAS, ROM, and shoulder disability. The outcome measure pain was measures using Visual analog scale. The availability of range of motion of shoulder was measured using universal goniometer. To calculate the extent of disability caused by the adhesive capsulitis was measured using shoulder pain and disability index.

- ***Result:***

While comparing pre-test and post-test scores using paired t-test, both the groups showed a significant difference in each parameter (VAS, shoulder ROM, SPADI= <0.001).

Independent sample t-test showed significant improvement in all the parameters (VAS, shoulder ROM in flexion, abduction and external rotation, SPADI= <0.001) of both the groups after 4 weeks of intervention.

- ***Conclusion:***

On the basis of result obtained from this study, Maitland mobilization is significantly more effective in increasing ROM, reducing pain on VAS and decreasing the shoulder disability compared to sleepers and posterior capsule stretch in patients with adhesive capsulitis.

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Keywords: *Maitland Mobilization, Adhesive Capsulitis, Visual Analog Scale, Sleepers Stretch, Posterior Capsule, Range of Motion.*

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I. INTRODUCTION

Adhesive capsulitis is otherwise also referred to as Frozen Shoulder (FS). It is a frequent pathologic disease of the shoulder joint. [1] Neviaser recommended that adhesive capsulitis was the appropriate name, after discovering persistent inflammation and fibrosis of the joint capsule that was tightly attached to the humeral head during the pathological tests. [2] It is marked by a sudden onset of pain and a progressive loss of glenohumeral joint motion, which causes a severe loss of shoulder function. It typically begins in one shoulder and frequently affects the other side years after the first shoulder experiences symptoms, although it is uncommon to affect the same shoulder twice.[6] The condition leads to functional restriction of both active and passive shoulder motion for which radiographs of the glenohumeral joint are essentially unremarkable except for the possible presence of osteopenia or calcific tendonitis.[3]

The volume of a typical shoulder joint is minimum 15 ml and on an average 20 ml[17]. But, the joint volume in a frozen shoulder is usually less than 5 ml. It is well-established that the rotator interval in conjunction with the coracohumeral ligament (CHL) plays a part in the pathophysiologic process of FS and may play crucial role in the development of the condition. The rest of the joint capsule is involved later as the condition progresses.[18,19,20] There is a high prevalence of frozen shoulder in the age group between 40 to 60 years of age. Although it is uncommon for the same shoulder to reappear, up to 20% of people experience identical issues in their contralateral shoulder.[5] Within five years, the opposite shoulder begins to deteriorate in 15% of patients and 80 % of patients will experience return of symptoms. [4,5].

The international Maitland Teachers Association (IMTA) defines the Maitland concept as a process of assessment, examination, and treatment of neuromusculoskeletal disorder by manipulative physiotherapy. The oscillations may have an inhibitory effect on the perception of painful stimuli by repetitively stimulating mechanoreceptors that block nociceptive pathways at the brain stem or spinal cord levels. These movements help improving the nutrition to the cartilage by moving the synovial fluid.

To isolate the soft tissue of the posterior portion of the shoulder, medical professionals and athletes have recently embraced a new stretch technique. Because it is performed with the patient in side-lying position, this technique is also known as the "Sleeper stretch". " In order to isolate the posterior soft tissue constraints and conduct the sleeper stretch, scapula is stabilized. Shoulder disorders very commonly involve posterior capsule tightness. The posterior capsule has an important role to play in function and control of normal arthrokinematics between the humeral head and glenoid cavity. Posterior capsule tightness refers as shortening of the capsule or shortening of the dynamic structures that are attached to this area.

Thus, the study aims to determine the effectiveness of Maitland mobilization versus sleeper stretch and posterior capsule stretch on pain, range of motion and shoulder functions in patients with adhesive capsulitis.

II. MATERIALS AND METHOD

The purpose of study was to evaluate effectiveness of Maitland's mobilization versus sleepers stretch and posterior capsule stretch on pain, rom and shoulder functions in patients with adhesive capsulitis. The study was carried out in Physiotherapy OPD of Narayana Hrudayalaya Health City, Bengaluru.

Total 60 participants were included in the study. The inclusion criterion of the study were Adults aged 40 to 60 years diagnosed with Periarthritis of shoulder, both genders will be included, Global ROM restriction, shoulder pain for more than 3 months, subject with positive abduction and external rotation test and adults who are willing to participate with the symptoms of the adhesive capsulitis. The exclusion criterion included in study were Patients with any trauma or accidental injuries to shoulder, neurological involvement, history or surgery on shoulder, individuals who have intra articular injections to the shoulder joint within 6 months prior to the study, Tumors/malignancy of bone, mental disorders. The study was introduced after screening the subjects according to the inclusion and exclusion criteria. Written consent was obtained from each participant. 60 subjects were divided into two groups. Group 1 and group 2. The assessment of each group was performed before and after the intervention. The interventions were supported outpatient rehabilitation programs in both groups. Both the groups received conventional physiotherapy treatment followed by Maitland mobilization in group 1 and Sleepers, posterior capsule stretch in group 2.

Conventional physiotherapy treatment includes electrotherapy, finger ladder, pendular exercise, wand exercise. The group 1 received Maitland mobilization along with conventional physiotherapy as mentioned above; anterior glide, posterior glide and caudal glide was given 2 to 3 oscillations per second for 30 seconds, 5 repetitions thrice a week for 4 weeks. The group 2 received sleepers, posterior capsule stretch with 5 repetitions with 30 second hold with 10 sec rest in between each stretch; 5 days a week for 4 weeks. Outcome measures VAS, shoulder ROM and SPADI were assessed pre and post intervention which was for 4 weeks.

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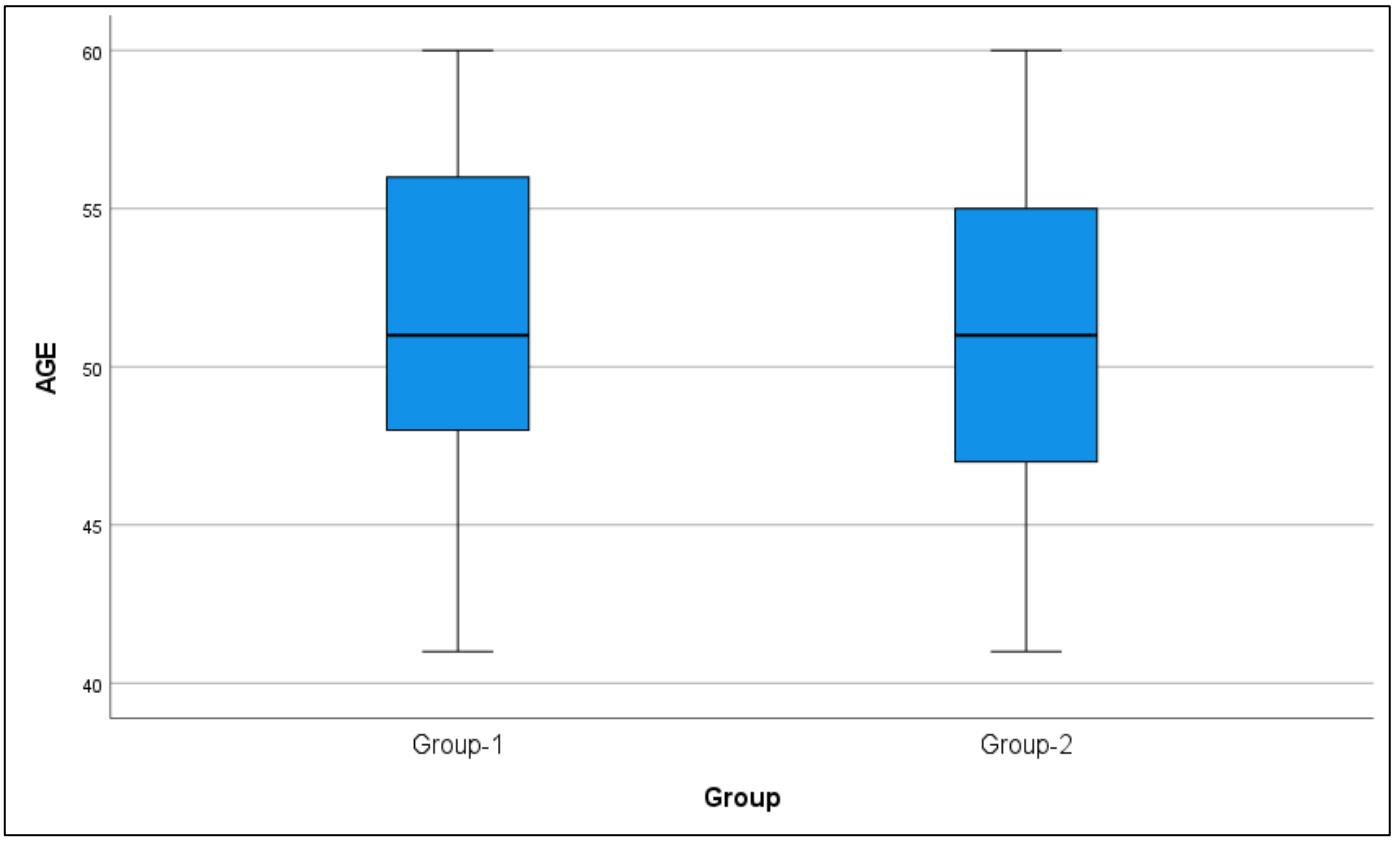
III. RESULT

➢ *Age Distribution*

Table 1: The Mean difference of Age in Both the Treatment Groups

	Group	Mean	Std. Deviation	t	P-Value
AGE	Group-1	51.73	5.078	0.394	0.695
	Group-2	51.20	5.391		



Graph 1: Comparison of Age Distribution Box Plot

- Interpretation: Table no. 1 and graph no. 1 shows distribution of age in group 1 and group 2. Where, the mean age of group 1 is 51.73±5.078and mean of group is 51.20±5.391. The P value of age is 0.695 (t=0.394).

➢ *Continuous Data*

Table 2: The Mean and Standard Deviation of Pre and Post Test of all the Outcome Measures (VAS, Shoulder Rom and SPADI) in group 1 and group 2

	Group-1		Group-2	
	Mean	Std. Deviation	Mean	Std. Deviation
PAIN PRE	5.50	1.432	5.63	1.520
PAIN-POST	2.57	1.251	3.43	1.478
FLEXION PRE-RANGE OF MOTION	145.60	13.942	145.70	9.675
FLEXION POST-RANGE OF MOTION	166.17	10.674	159.50	9.291
ABDUCTION PRE-RANGE OF MOTION	103.03	11.622	106.33	7.893
ABDUCTION POST-RANGE OF MOTION	151.50	16.874	126.70	10.600
INTERNAL ROTATION PRE	45.43	5.587	44.83	5.272
INTERNAL ROTATION POST	65.47	7.243	63.30	6.814
EXTERNAL ROTATION PRE	17.77	6.004	18.77	5.905
EXTERNAL ROTATION POST	41.00	8.538	26.33	5.054
SPADI PRE	81.27	4.378	82.03	5.136
SPADI POST	57.20	5.524	68.13	5.526

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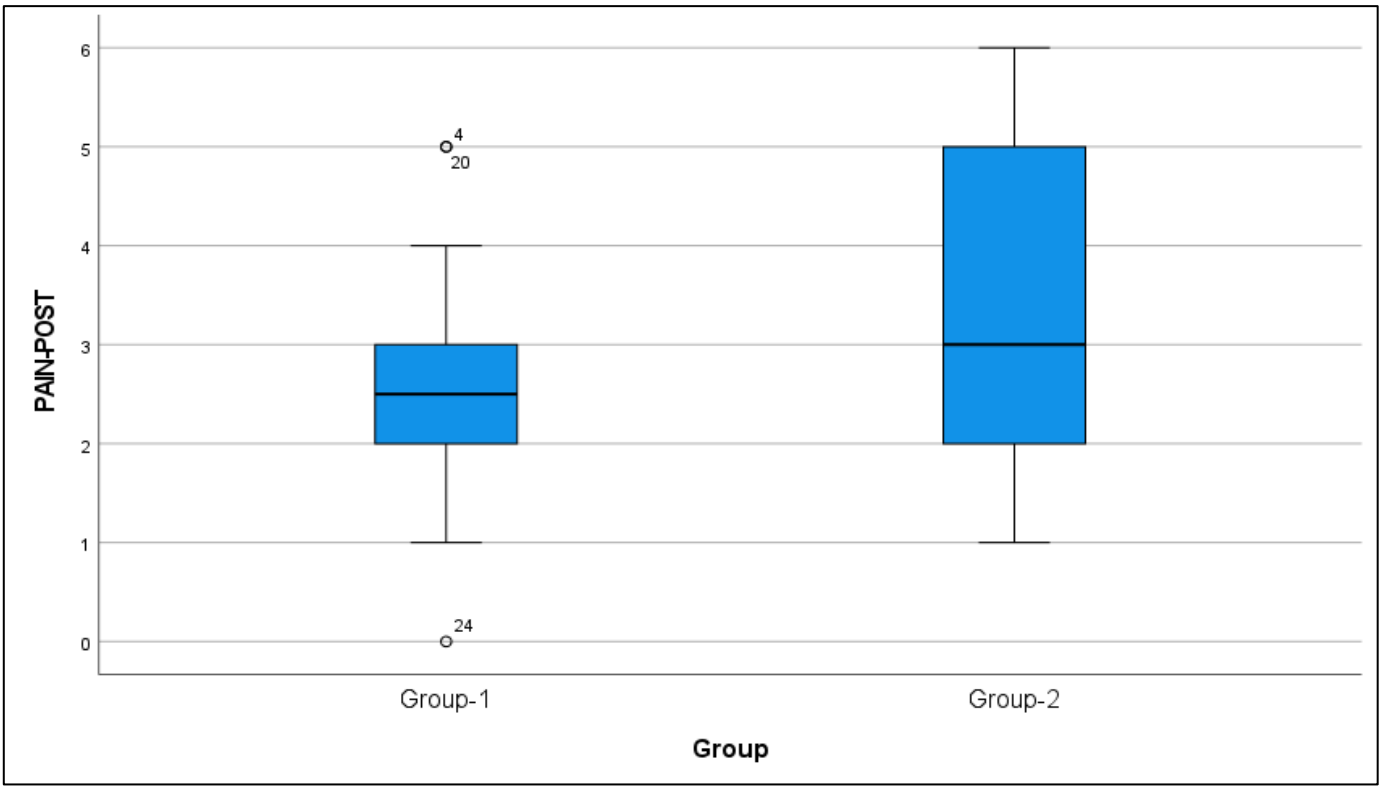
➢ *Comparing between the Group-1 and Group-2*

- *Pain*

Table 3: Comparison of Mean Pain Scores Post-Intervention between Treatment Groups

	Group	Mean	Std. Deviation	t	P-Value
PAIN-POST	Group-1	2.57	1.251	0.321	0.017*
	Group-2	3.43	1.478		



Graph 2: Comparison of Pain Post Intervention Analysis between Group 1 and 2

- Interpretation: Table no.3 and graph no.2 represents post intervention pain data of both the treatment groups. It is represented by mean and SD values of each group. The mean of group 1 was found to be 2.567±1.251 and group 2 was 3.43±1. 478.The p value for comparison of post intervention pain between the groups was 0.017 (t=0.321). This suggests that there is a statistically significant difference in the post-treatment pain values between the two groups.

➢ *Shoulder Rom*

- *Flexion*

Table 4: Comparison of Mean Flexion ROM Post-Intervention between Treatment Groups

	Group	Mean	Std. Deviation	t	P-Value
FLEXION POST-RANGE OF MOTION	Group-1	166.17	10.674	0.193	0.012*
	Group-2	159.50	9.291		

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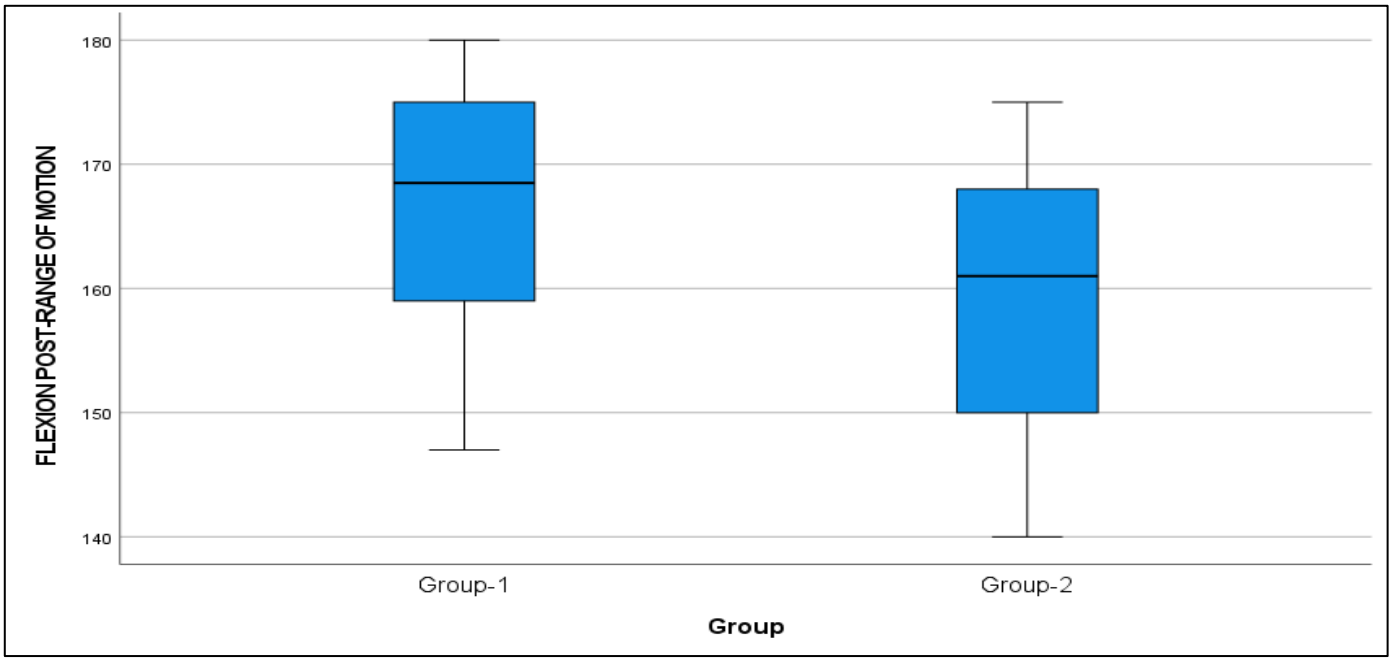


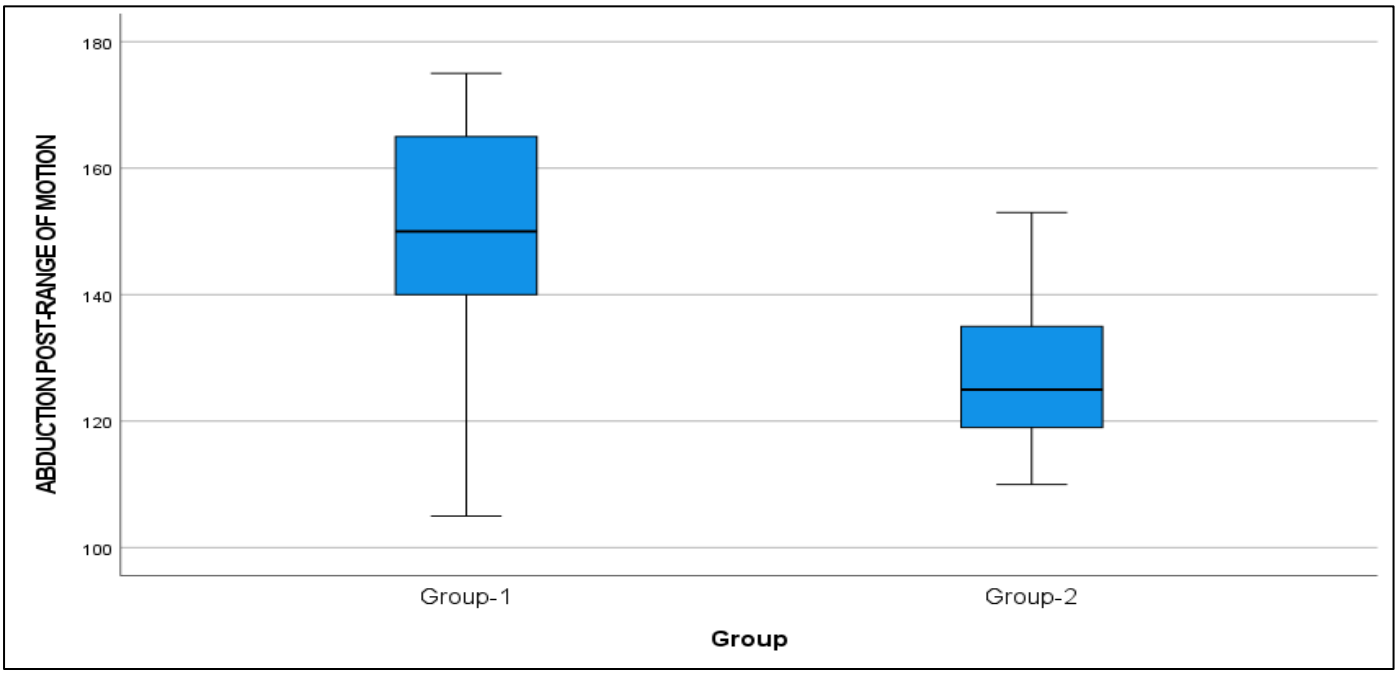
Graph 3: Comparison of Flexion Rom Post Intervention Analysis between Group 1 and 2.

- Interpretation: Table no.4 and graph no.3 represents post intervention comparison of flexion ROM between both the treatment groups. It is represented by mean and SD values of each group. The mean of group 1 was found to be 166.17±10.674 and group 2 was 159.50±9. 291.The p value for comparison of post intervention values between the groups was 0.012 (t=0.193). This suggests that there is a statistically significant difference in the post-treatment flexion ROM values between group 1 and 2.

➢ *Abduction*

Table 5: Comparison of Mean Abduction ROM Post-Intervention between Treatment Groups

	Group	Mean	Std. Deviation	t	P-Value
ABDUCTION POST-RANGE OF MOTION	Group-1	151.50	16.874	0.032	<0.001*
	Group-2	126.70	10.600		



Graph 4: Comparison of Abduction Rom Post Intervention Analysis Between Group 1 and 2

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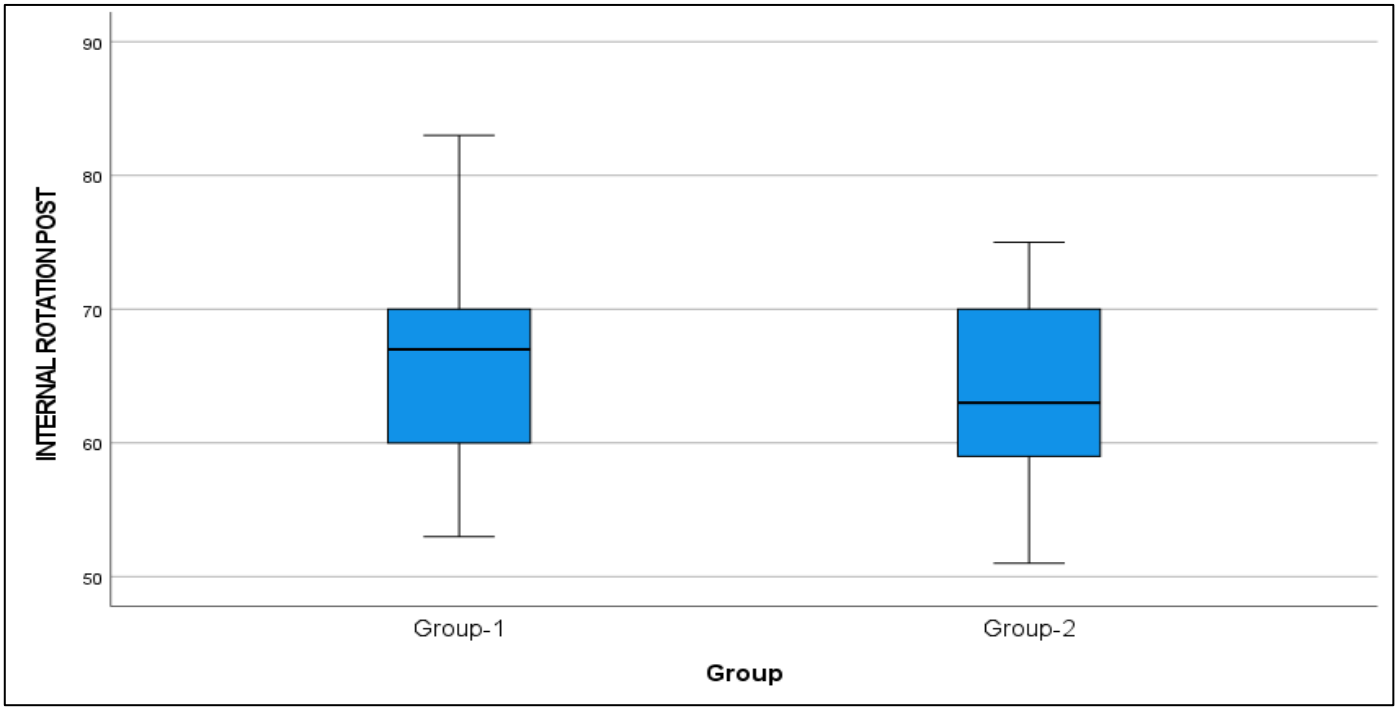
- Interpretation: Table no.5 and graph no.4 represents post intervention comparison of abduction ROM between both the treatment groups. It is represented by mean and SD values of each group. The mean of group 1 was found to be 151.50±16.874 and group 2 was 126.70±10.6. The p value for comparison of post intervention pain between the groups was <0.001 (t=0.032). This suggests that there is a strong statistically significant difference in the post-treatment abduction ROM values between group 1 and 2.

➢ *Internal Rotation*

Table 6: Comparison of Mean Internal Rotation ROM Post-Intervention between Treatment Groups

	Group	Mean	Std. Deviation	t	P-Value
INTERNAL ROTATION POST	Group-1	65.47	7.243	0.921	0.238
	Group-2	63.30	6.814		



Graph 5: Comparison of Internal Rotation Rom Post Intervention Analysis Between Group 1 and 2

- Interpretation: Table no.6 and graph no.5 represents post intervention comparison of internal rotation ROM between both the treatment groups. It is represented by mean and SD values of each group. The mean of group 1 was found to be 65.47±7.243 and group 2 was 63.30±6.814. The p value for comparison of post intervention pain between the groups was 0.238 (t=0.921). This suggests there is no statistically significant difference in internal rotation post-treatment between Group 1 and Group 2.

➢ *External Rotation*

Table 7: Comparison of Mean External Rotation ROM post-Intervention Between Treatment Groups

	Group	Mean	Std. Deviation	t	P-Value
EXTERNAL ROTATION POST	Group-1	41.00	8.538	0.008	<0.001*
	Group-2	26.33	5.054		

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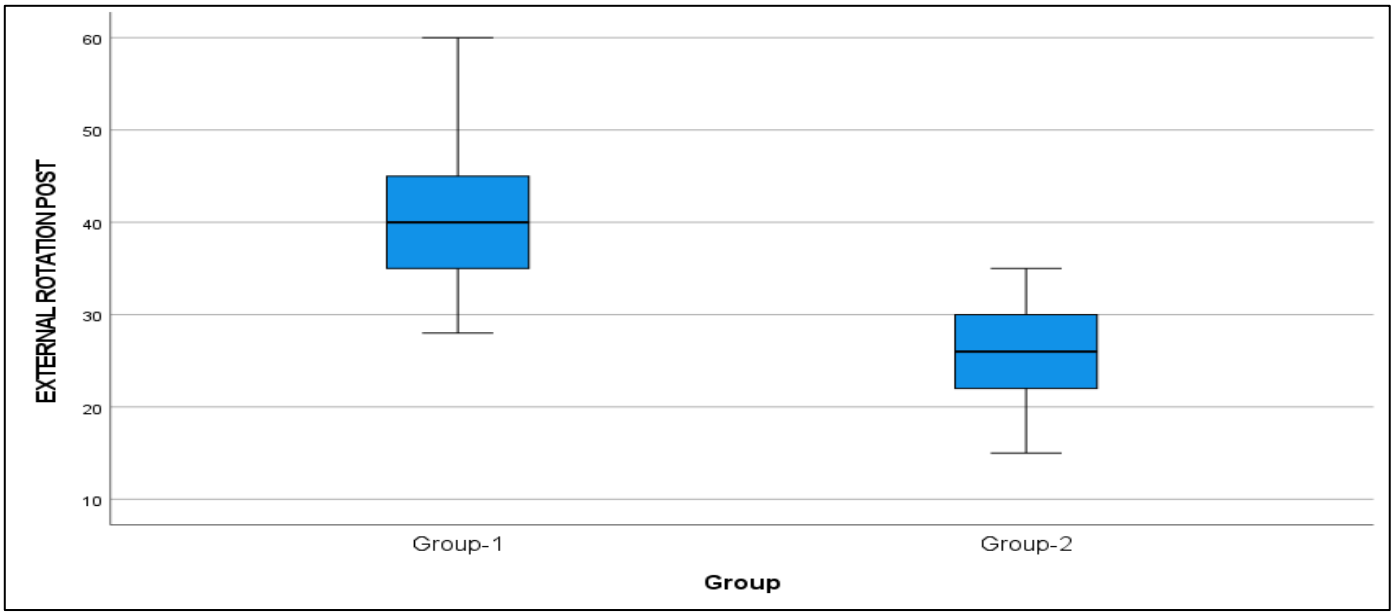


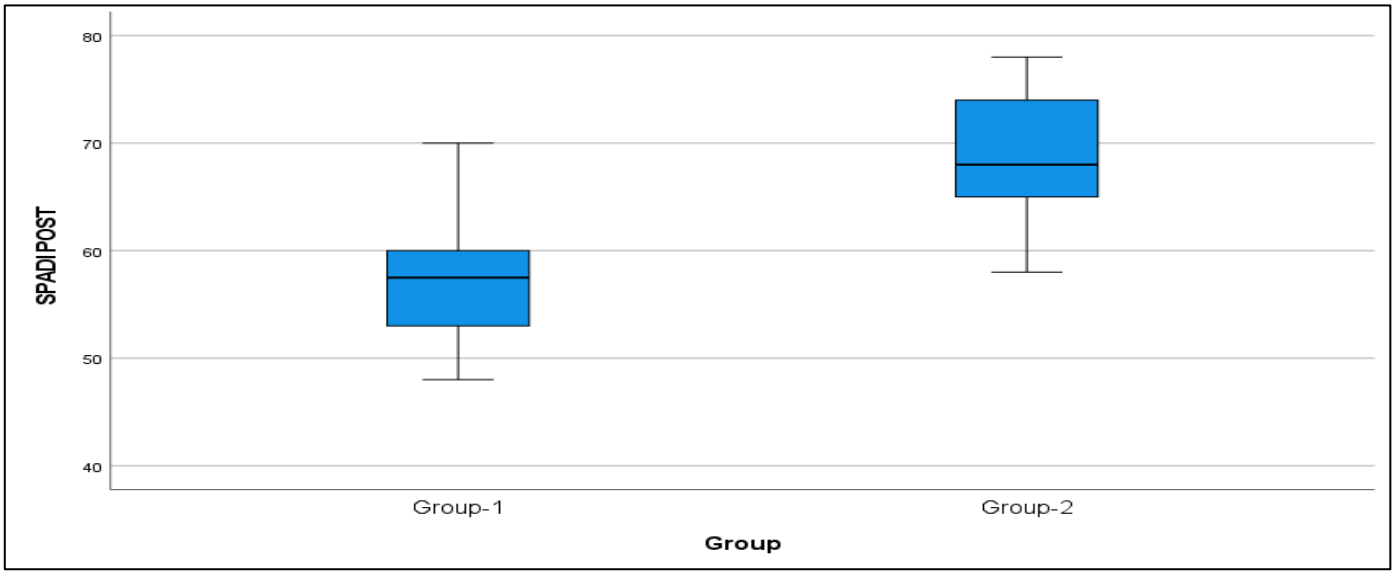
Graph 6: Comparison of External Rotation Rom Post Intervention Analysis between Group 1 and 2

- Interpretation: Table no.7 and graph no.6 represents post intervention comparison of external rotation ROM between both the treatment groups. It is represented by mean and SD values of each group. The mean of group 1 was found to be 41±8.538 and group 2 was 26.33±5.054. The p value for comparison of post intervention pain between the groups was <0.001 (t=0.008). This suggests that there is a strong statistically significant difference in the post-treatment external rotation ROM values between group 1 and 2.

➢ *Shoulder Pain and Disability Index*

Table 8: Comparison of Mean Shoulder Pain and Disability Index (SPADI) Post -Intervention between Treatment Groups

	Group	Mean	Std. Deviation	t	P-Value
SPADI POST	Group-1	57.20	5.524	0.953	<0.001*
	Group-2	68.13	5.526		



Graph 7: Comparison of Spadi Score Post Intervention Analysis Between Group 1 and 2

- Interpretation: Table no.8 and graph no.7 represents post intervention comparison of SPADI scores between both the treatment groups. It is represented by mean and SD values of each group. The mean of group 1 was found to be 57.20±5.524 and group 2 was 68.13±5.526. The p value for comparison of post intervention pain between the groups was <0.001 (t=0.953). This suggests that there is a strong statistically significant difference in the post-treatment values between group 1 and 2.

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IV. DISCUSSION

Shoulder joint is an exceptional anatomical structure with its remarkable range of motion that it provides. As a matter of fact, it provides highest amount of mobility than any other joint in human body. Therefore, reduced mobility of this joint can lead to severe morbidity.[52]Adhesive capsulitis is a pathological condition characterized by excessive scar tissue or adhesion formation across the glenohumeral joint. This results in discomfort, pain, stiffness and dysfunction. A painful and stiff shoulder can negatively impact everyday activities and, as a result, degrade quality of life. On the contrary to which there are evidences that prove between 20% and 50% of patients may go on to develop long-lasting symptoms.[53,54]

According to definition based on American Academy of Orthopaedic Surgeons for diagnosis of adhesive capsulitis diagnosis is made, emphasizing the progressive development of global limitation of shoulder mobility without substantial abnormalities on radiographs.[55,56]The condition predominantly affects females than males with a ratio of 1.4:1 also, the nondominant hand seems to be affected to a greater extent. Adhesive capsulitis is more common in patients with autoimmune comorbidities, such as diabetes mellitus and thyroid conditions.[57]

The pathophysiology of adhesive capsulitis is unclear. However, current studies suggest primarily there is inflammation present within the synovial lining and joint capsule later reactive fibrosis and adhesions in the synovial lining which triggers Adhesive Capsulitis. Capsular fibrosis and adhesions limit range of motion, and the initial inflammation of the capsule leads to pain.[60]

Pain relief through Maitland's mobilization could be ascribed to an array of beneficial results of mobilization, including of local physiological mechanisms as well as additional central mechanisms. Mechanoreceptors and proprioceptors are stimulated by small oscillations amplitude and distraction movements. As a result of mobilization, oscillation may inhibit the perception of painful stimuli by repeatedly stimulating mechanoreceptors associated to myelinated alpha-beta and alpha-delta fibres at the spinal cord or brain stem level.

The positive impact of engaging in mobility exercises to enhance shoulder function may stem from various factors. One possible explanation is that by performing repeated end-range movements, mechanoreceptors could be stimulated, potentially leading to pain reduction, as suggested by the pain gate theory. Another study demonstrated that exercises trigger the release of non-opioid substances like serotonin, norepinephrine, dopamine, and GABA. Additionally, mobility exercises involve repeatedly moving the joint through its full range of motion, which stretches the joint capsule and consequently enhances the range of motion.[63]

In a comprehensive analysis done by Cavalleri E et.al where goal was to determine the efficacy of physical therapy in patients with primary or idiopathic frozen shoulder. They concluded that rehabilitation treatment specifically mobilization and exercises are most effective in treating frozen shoulder. In an investigatory report prepared by Nakandala Piumi et.al the evidence suggests that certain physical therapy techniques and modalities are strongly recommended for pain relief, improvement of ROM, and functional status in patients with adhesive capsulitis. Also, in research done by Tarang K. Jain et.al have determined that: Therapeutic exercises and mobilization are strongly recommended for reducing pain, improving range of motion (ROM) and function in patients with stages 2 and 3 of frozen shoulder.

All the above articles highlight physiotherapy as a vital intervention in the treatment of adhesive capsulitis. Suzie Noten et.al in their investigation to uncover the efficacy of different types of isolated articular mobilization techniques in patients with primary adhesive capsulitis (AC) of the shoulder have shown Maitland technique to be recommended at the moment. In research done by Neeti Mishra et.al on comparing the effectiveness between capsular stretch and sleepers stretch revealed sleepers stretch to be more effective by indicating better outcome results than the other.

So according to previous studies the present study is pursued to evaluate the effectiveness of Maitland's mobilization vs sleepers stretch and posterior capsule stretch on pain, range of motion and shoulder function in patients with adhesive capsulitis.

This current study also found that the selected intervention reduces pain, increases shoulder range of motion, and decreases functional disability, consistent with findings from previous authors.

A. Improvement in Reducing Pain:

In this study pain was measured by visual analog scale. The pre-intervention value for the group 1 and group 2 was 5.50±1.432 and 5.63±1.520 respectively. The post-intervention VAS scores for group 1 & group 2 were 2.57±1.251 and 3.43±1.478 respectively. A paired t-test was performed to calculate significance, demonstrating a significant reduction in pain in both groups post-intervention.

Post-intervention mean values between the two groups were calculated using an independent t-test. A significant difference was found between Group 1 and Group 2 ($p<0.001$) after 4 weeks of intervention.

In a study performed by Do Moon G et.al evaluated the effect of Maitland mobilization and Kaltenborn mobilization techniques for improving pain and range of motion in patients with frozen shoulders sums ups both the type of mobilization is equally effective in improving range of motion and pain. Shehri Abdullah et.al in their study showed Maitland Mobilization along with exercises improves the symptoms of frozen shoulder. Statistical analysis shows that Maitland mobilization is statistically notable in improving the symptoms. Similar results were also found in a study done by Sami S. et.al. Mohammed Ameer Hussain et.al in their study found that sleeper, cross body stretch has statistically

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significant better reduction in Pain in VAS in the treatment of frozen shoulder.

B. Improvement in Functional Mobility by Measuring Shoulder Range of Motion:

So, in this current study shoulder range of motion is used to check the functional mobility of patients with adhesive capsulitis and shoulder range of motion is measured using a goniometer. The pre-intervention value for flexion in group 1 and group 2 were 145.60 ±13.942 and 145.70 ±9.675 respectively. The post-intervention flexion ROM score for group 1 and group 2 were 166.17±10.674 and 159.50±9.291 respectively. By using paired t-test it is proved that there was significant improvement seen after intervention among the group 1 and group 2.

Now, when compared post-intervention difference value scores between the group 1 and group 2 by using an independent t-test. A significant difference was found in both group 1 and group 2 ($p=0.012$) after 4 weeks of the duration of intervention.

The pre-intervention value for abduction in group 1 and group 2 were 103.03±11.622 and 106.33 ±7.893 respectively. The post-intervention abduction ROM score for group 1 and group 2 were 151.50±16.874 and 126.70±10.60 respectively. By using paired t-test it is proved that there was significant improvement seen after intervention among the group 1 and group 2.

Now, when compared post-intervention difference value scores between the group 1 and group 2 by using an independent t-test. Significant difference was found in both group 1 and group 2 ($p<0.001$) after 4 weeks of the duration of intervention.

The pre-intervention value for internal rotation in group 1 and group 2 were 45.43±5.587 and 44.83 ±5.272 respectively. The post-intervention IR ROM score for group 1 and group 2 were 65.47±7.243 and 63.30±6.814 respectively. By using paired t-test it is proved that the significant improvement was not pronounced after intervention among the group 1 and group 2.

Now, when compared post-intervention difference value scores between the group 1 and group 2 by using an independent t-test. There is no statistically significant difference found between both group 1 and group 2 after 4 weeks of the duration of intervention

The pre-intervention value for external rotation in group 1 and group 2 were 17.77±8.538 and 18.77 ±5.905 respectively. The post-intervention ER ROM score for group 1 and group 2 were 41.00±6.004 and 26.33±5.054 respectively. By using paired t-test it is proved that there was significant improvement seen after intervention among the group 1 and group 2.

Now, when compared post-intervention difference value scores between the group 1 and group 2 by using an independent t-test. So, extremely significant difference was found in both group 1 and group 2 ($p<0.001$) after 4 weeks of the duration of intervention.

In a study done by Samiksha Sathe et.al concluded there is significant increase in range of motion and better functional outcome when Maitland mobilization therapy along with conventional therapy is given to patients with adhesive capsulitis .Mouleeswari B et.al in their study to find the effectiveness of midlands mobilization and muscle energy technique in adhesive capsulitis patients suggested that there is significant increase in ROM and functional ability as reduced pain by Maitland mobilization in comparison to the latter .

In research done by Duzgun I et.al in the year 2019 in their RCT based on their result suggested that Scapular mobilization and manual posterior capsule stretching interventions were effective in improving the acute joint range of motion in frozen shoulder patients. In a study done by Kedar s et.al have concluded that sleepers stretch is effective in improving shoulder ROM and reducing pain and improves ability to do ADLs.

Range of motion exercises also contribute in improving joint and soft tissue mobility and decreases risk of adhesions and contracture formation. Stretching exercises given were also helpful in breaking the collagen bonds and realignment of the fibres for permanent elongation or increased flexibility and mobility of the soft tissues that have adaptively shortened and become hypo mobile over time in Frozen Shoulder. [49]

C. Improvement in Reducing Functional Disability by using the SPADI Scale:

In this study SPADI scale is used for measuring functional disability with 2 components i.e. pain and disability. The pre-intervention value for the group 1 and group 2 were 81.27±4.378 and 82.03 ±5.136 respectively. The post-intervention SPADI score for group 1 and group 2 were 57.20±5.524 and 68.13±5.526 respectively. By using paired t-test it is proved that there was significant improvement seen after intervention among the group 1 and group 2.

Now, when compared post-intervention difference value scores between the group 1 and group 2 by using an independent t-test. So, a significant difference was found in both the group 1 and group 2 ($p<0.001$) after 4 weeks of the duration of intervention.

Muhammad Z et.al the findings of their study suggest that Maitland mobilization is effective in decreasing the disability improving the functional status and reducing pain in adhesive capsulitis patients. In research performed by Zaki A et.al in their study revealed that Maitland mobilization not only is effective in reducing pain and improving ROM but also shows significant improvement of the functional scores and associated disability performance. In a study performed by Meena M et.al where they compared effectiveness of Sleeper Stretch and cross-Body stretch For Improving Posterior Shoulder Tightness, Pain and Function in Patients

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with Adhesive Capsulitis was performed. This study demonstrated a positive outcome of both the types of stretches for improving the posterior shoulder tightness by improving the range, reducing the pain and enhancing functional level of the patients with adhesive capsulitis.

The rationale behind the improvement in functional independence in both the groups might be due to ease in pain and increased range of motion, consequently lessened suffering in daily activities, pain with specific everyday jobs, and difficulty in lifting and movement of the arm.

Hence, including an exercise program for overall well-being of the patient is essential. The current study demonstrates a combination of Maitland mobilization and sleepers, posterior stretch leads to significant improvement in reducing functional disability.

In this study participants allotted in group 1 were given Maitland mobilization and group 2 were given sleepers and posterior capsule stretch. Both treatments are statistically significant for improvement in reducing pain, increase range of motion and improvement in reducing functional disability in patients with adhesive capsulitis.

V. CONCLUSION

The study concludes that the effectiveness in improving movement ability and functional status in both treatment groups are remarkable. However, group 1 (Maitland mobilization + conventional therapy) shows higher significance than group 2(sleepers stretch and posterior capsule stretch+ conventional therapy).

REFERENCES

[1]. Cho CH, Lee YH, Kim DH, Lim YJ, Baek CS, Kim DH. Definition, diagnosis, treatment, and prognosis of frozen shoulder: a consensus survey of shoulder specialists. Clinics in orthopedic surgery. 2020 Mar 1;12(1):60-7.

[2]. Binder AI, Bulgen DY, Hazleman BL, Tudor J, Wraight P. Frozen shoulder: an arthrographic and radio nuclear scan assessment. Annals of the rheumatic diseases. 1984 Jun 1;43(3):365-9.

[3]. Zuckerman JD, Rokito A. Frozen shoulder: a consensus definition. Journal of Shoulder and Elbow Surgery. 2011 Mar 1;20(2):322-5.

[4]. Kingston K, Curry EJ, Galvin JW, Li X. Shoulder adhesive capsulitis: epidemiology and predictors of surgery. Journal of shoulder and elbow surgery. 2018 Aug 1;27(8):1437-43.

[5]. Robinson CM, Seah KM, Chee YH, Hindle P, Murray IR. Frozen shoulder. The Journal of bone and joint surgery. British volume. 2012 Jan;94(1):1-9.

[6]. Jain TK, Sharma NK. The effectiveness of physiotherapeutic interventions in treatment of frozen shoulder/adhesive capsulitis: a systematic review. Journal of back and musculoskeletal rehabilitation. 2014 Jan 1;27(3):247-73.

[7]. Chan HB, Pua PY, How CH. Physical therapy in the management of frozen shoulder. Singapore medical journal. 2017 Dec;58(12):685.

[8]. Almureef SS, Ali WM, Shamsi S, Al Zahrani MB. Effectiveness of mobilization with conventional physiotherapy in frozen shoulder: a systematic review. International journal of recent innovations in medicine and clinical research. 2020;2(4):22-9.

[9]. Kumar A, Kumar S, Aggarwal A, Kumar R, Das PG. Effectiveness of Maitland Techniques in idiopathic shoulder adhesive capsulitis. International Scholarly Research Notices. 2012;2012.

[10]. Neeti Mishra et al.2018, Effect of Capsular Stretch Versus Sleeper Stretch on Pain, Rom and Shoulder Functions in Patients with Adhesive Capsulities –A comparative study. Int J Recent Sci Res. 9(4), pp. 25634-25637. DOI: http://dx.doi.org/10.24327/ijrsr.2018.0904.1897

[11]. Duzgun I, Turgut E, Çinar-Medeni Ö, Kafa N, Tuna Z, Elbasan B, Oskay D. The presence and influence of posterior capsule tightness on different shoulder problems. Journal of Back and Musculoskeletal Rehabilitation. 2017 Jan 1;30(2):187-93.

[12]. Venturin D, Giannotta G, Pellicciari L, Rossi A, Pennella D, Goffredo M, Poser A. Reliability and validity of the Shoulder Pain and Disability Index in a sample of patients with frozen shoulder. BMC Musculoskeletal Disorders. 2023 Dec;24(1):1-9.

[13]. Boonstra AM, Preuper HR, Reneman MF, Posthumus JB, Stewart RE. Reliability and validity of the visual analogue scale for disability in patients with chronic musculoskeletal pain. International journal of rehabilitation research. 2008 Jun 1;31(2):165-9.

[14]. Do Moon G, Lim JY, Da YK, Kim TH. Comparison of Maitland and Kaltenborn mobilization techniques for improving shoulder pain and range of motion in frozen shoulders. Journal of physical therapy science. 2015;27(5):1391-5.

[15]. Manske RC, Prohaska D. Diagnosis and management of adhesive capsulitis. Current reviews in musculoskeletal medicine. 2008 Dec;1:180-9.

[16]. Zreik NH, Malik RA, Charalambous CP. Adhesive capsulitis of the shoulder and diabetes: a meta-analysis of prevalence. Muscles, ligaments and tendons journal. 2016 Jan;6(1):26.

[17]. Luke TA, Rovner AD, Karas SG, Hawkins RJ, Plancher KD. Volumetric change in the shoulder capsule after open inferior capsular shift versus arthroscopic thermal capsular shrinkage: a cadaveric model. Journal of shoulder and elbow surgery. 2004 Mar 1;13(2):146-9.

[18]. Itoi E, Arce G, Bain GI, Diercks RL, Guttmann D, Imhoff AB, Mazzocca AD, Sugaya H, Yoo YS. Shoulder stiffness: current concepts and concerns. Arthroscopy: The Journal of Arthroscopic & Related Surgery. 2016 Jul 1;32(7):1402-14.

[19]. CHARLES S NEER II, SATTERLEE CC, DALSEY RM, FLATOW EL. The anatomy and potential effects of contracture of the coracohumeral ligament. Clinical Orthopaedics and Related Research®. 1992 Jul 1;280:182-5.

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14744542

[20]. Ozaki JI, Nakagawa Y, Sakurai G, Tamai S. Recalcitrant chronic adhesive capsulitis of the shoulder. Role of contracture of the coracohumeral ligament and rotator interval in pathogenesis and treatment. JBJS. 1989 Dec 1;71(10):1511-5.
[21]. Sun Y, Liu S, Chen S, Chen J. The effect of corticosteroid injection into rotator interval for early frozen shoulder: a randomized controlled trial. The American Journal of Sports Medicine. 2018 Mar;46(3):663-70.
[22]. Hagiwara Y, Ando A, Kanazawa K, Koide M, Sekiguchi T, Hamada J, Itoi E. Arthroscopic coracohumeral ligament release for patients with frozen shoulder. Arthroscopy Techniques. 2018 Jan 1;7(1):e1-5.
[23]. Kim DH, Sung DH, Ga HY, Choi JY. Metabolic patterns of the shoulder joint on 18 F-fluorodeoxyglucose positron emission tomography/computed tomography in adhesive capsulitis. Annals of nuclear medicine. 2014 Feb;28:136-44.
[24]. Okuno Y, Oguro S, Iwamoto W, Miyamoto T, Ikegami H, Matsumura N. Short-term results of transcatheter arterial embolization for abnormal neovessels in patients with adhesive capsulitis: a pilot study. Journal of Shoulder and Elbow Surgery. 2014 Sep 1;23(9):e199-206.
[25]. Hannafin JA, DiCarlo EF, Wickiewicz TL, Warren RF. Adhesive capsulitis: capsular fibroplasia of the glenohumeral joint. J Shoulder Elbow Surg. 1994;3(5):435.
[26]. Ryan V, Brown H, Minns Lowe CJ, Lewis JS. The pathophysiology associated with primary (idiopathic) frozen shoulder: A systematic review. BMC musculoskeletal disorders. 2016 Dec;17:1-21.
[27]. Bunker TD, Anthony PP. The pathology of frozen shoulder. A Dupuytren-like disease. The Journal of Bone & Joint Surgery British Volume. 1995 Sep 1;77(5):677-83.
[28]. Hettrich CM, DiCarlo EF, Faryniarz D, Vadasdi KB, Williams R, Hannafin JA. The effect of myofibroblasts and corticosteroid injections in adhesive capsulitis. Journal of shoulder and elbow surgery. 2016 Aug 1;25(8):1274-9.
[29]. Kilian O, Pfeil U, Wenisch S, Heiss C, Kraus R, Schnettler R. Enhanced alpha1 (I) mRNA expression in frozen shoulder and dupuytren tissue. European journal of medical research. 2007 Dec 14;12(12):585.
[30]. Hutchinson JW, Tierney GM, Parsons SL, Davis TR. Dupuytren's disease and frozen shoulder induced by treatment with a matrix metalloproteinase inhibitor. The Journal of Bone & Joint Surgery British Volume. 1998 Sep 1;80(5):907-8.
[31]. Lubis AM, Lubis VK. Matrix metalloproteinase, tissue inhibitor of metalloproteinase and transforming growth factor-beta 1 in frozen shoulder, and their changes as response to intensive stretching and supervised neglect exercise. Journal of Orthopaedic Science. 2013 Jul;18:519-27.
[32]. Kraal T, Lübbers J, van den Bekerom MP, Alessie J, van Kooyk Y, Eygendaal D, Koorevaar RC. The puzzling pathophysiology of frozen shoulders–a scoping review. Journal of Experimental Orthopaedics. 2020 Dec;7(1):1-5.
[33]. Bunker TD. Frozen shoulder: unravelling the enigma. Annals of the Royal College of Surgeons of England. 1997 May;79(3):210.
[34]. Biernacka A, Dobaczewski M, Frangogiannis NG. TGF-β signaling in fibrosis. Growth factors. 2011 Oct 1;29(5):196-202.
[35]. Piersma B, Bank RA, Boersema M. Signaling in fibrosis: TGF-β, WNT, and YAP/TAZ converge. Frontiers in medicine. 2015 Sep 3;2:59.
[36]. Hong-yun LI, Shi-yi CH, Wei-tao ZH. Expression of transforming growth factor-beta and metalloproteinases in joint capsule of frozen shoulder. Journal of Shanghai Jiaotong University (Medical Science). 2009 Nov 25;29(11):1363.
[37]. Arora PD, Narani N, McCulloch CA. The compliance of collagen gels regulates transforming growth factor-β induction of α-smooth muscle actin in fibroblasts. The American journal of pathology. 1999 Mar 1;154(3):871-82.
[38]. Cho CH, Song KS, Kim BS, Kim DH, Lho YM. Biological aspect of pathophysiology for frozen shoulder. BioMed Research International. 2018 May 24;2018.
[39]. Rodeo SA, Hannafin JA, Tom J, Warren RF, Wickiewicz TL. Immunolocalization of cytokines and their receptors in adhesive capsulitis of the shoulder. Journal of Orthopaedic Research. 1997 May;15(3):427-36.
[40]. Cher JZ, Akbar M, Kitson S, Crowe LA, Garcia-Melchor E, Hannah SC, McLean M, Fazzi UG, Kerr SC, Murrell GA, Millar NL. Alarmins in frozen shoulder: a molecular association between inflammation and pain. The American journal of sports medicine. 2018 Mar;46(3):671-8.
[41]. Taniguchi N, Kawakami Y, Maruyama I, Lotz M. HMGB proteins and arthritis. Human cell. 2018 Jan;31:1-9.
[42]. Lee WJ, Song SY, Roh H, Ahn HM, Na Y, Kim J, Lee JH, Yun CO. Profibrogenic effect of high-mobility group box protein-1 in human dermal fibroblasts and its excess in keloid tissues. Scientific reports. 2018 May 30;8(1):8434.
[43]. Pandey V, Aier S, Agarwal S, Sandhu AS, Murali SD. Prevalence of prediabetes in patients with idiopathic frozen shoulder: a prospective study. JSES international. 2024 Jan 1;8(1):85-9.
[44]. Maini S, Bansal A, Arora R, Bansal S. Prevalence of diabetes in patients with frozen shoulder. J Evolution Med Dent Sci. 2019 Mar 18;8(11):804-6.
[45]. Duzgun I, Turgut E, Eraslan L, Elbasan B, Oskay D, Atay OA. Which method for frozen shoulder mobilization: manual posterior capsule stretching or scapular mobilization?. Journal of musculoskeletal & neuronal interactions. 2019;19(3):311.

ISSN No:-2456-2165 https://doi.org/10.5281/zenodo.14744542

[46]. Meena M. Comparative Effectiveness Of Sleeper Stretch And Cross-Body Stretch For Improving Posterior Shoulder Tightness, Pain And Function In Patients With Adhesive Capsulitis–A Randomized Controlled Trial.
[47]. Zahoor M, Ali B, Khan A, Zeb GS, Sumayyah E, Qamar G. Effectiveness of Maitland manual therapy technique in management of idiopathic adhesive capsulitis. Annals of Allied Health Sciences. 2021 Jun 30;7(1):3-7.
[48]. Sharma SK. Comparative Evaluation of Muscle Energy Technique and Maitland Mobilization Technique on Functional Activity, Motion Range, and Pain in Subjects with Adhesive Capsulitis. Tobacco Regulatory Science (TRS). 2022 May 25:848-53.
[49]. Al Shehri A, Almureef SS, Khan S, Shamsi S. Efficacy of maitland mobilization in frozen shoulder. Europ J Biomed Pharma Sci. 2018;5(12):22-7.
[50]. Chester R, Jerosch-Herold C, Lewis J, Shepstone L. The SPADI and QuickDASH are similarly responsive in patients undergoing physical therapy for shoulder pain. journal of orthopaedic & sports physical therapy. 2017 Aug;47(8):538-47.
[51]. Tveitå EK, Ekeberg OM, Juel NG, Bautz-Holter E. Responsiveness of the shoulder pain and disability index in patients with adhesive capsulitis. BMC musculoskeletal disorders. 2008 Dec;9:1-8
[52]. Manske RC, Prohaska D. Diagnosis and management of adhesive capsulitis. Current reviews in musculoskeletal medicine. 2008 Dec;1:180-9.
[53]. Hand C, Clipsham K, Rees JL, Carr AJ. Long-term outcome of frozen shoulder. Journal of shoulder and elbow surgery. 2008 Mar 1;17(2):231-6.
[54]. Le HV, Lee SJ, Nazarian A, Rodriguez EK. Adhesive capsulitis of the shoulder: review of pathophysiology and current clinical treatments. Shoulder & Elbow. 2017;9(2):75-84. doi:10.1177/1758573216676786
[55]. Allen GM. The diagnosis and management of shoulder pain. J Ultrason. 2018;18(74):234-239. doi: 10.15557/JoU.2018.0034. PMID: 30451406; PMCID: PMC6442215.
[56]. McKean D, Yoong P, Brooks R, Papanikitas J, Hughes R, Pendse A, McElroy BJ. Shoulder manipulation under targeted ultrasound-guided rotator interval block for adhesive capsulitis. Skeletal Radiol. 2019 Aug;48(8):1269-1274. doi: 10.1007/s00256-018-3105-3. Epub 2018 Nov 16. PMID: 30446788.
[57]. Sheridan MA, Hannafin JA. Upper extremity: emphasis on frozen shoulder. Orthop Clin North Am. 2006 Oct;37(4):531-9. doi: 10.1016/j.ocl.2006.09.009. PMID: 17141009.
[58]. Ewald A. Adhesive capsulitis: a review. Am Fam Physician. 2011 Feb 15;83(4):417-22. PMID: 21322517.
[59]. Rundquist PJ, Anderson DD, Guanche CA, Ludewig PM. Shoulder kinematics in subjects with frozen shoulder. Arch Phys Med Rehabil. 2003 Oct;84(10):1473-9. doi: 10.1016/s0003-9993(03)00359-9. PMID: 14586914.
[60]. Dias R, Cutts S, Massoud S. Frozen shoulder. BMJ. 2005 Dec 17;331(7530):1453-6. doi: 10.1136/bmj.331.7530.1453. PMID: 16356983; PMCID: PMC1315655.
[61]. Patel R, Urits I, Wolf J, Murthy A, Cornett EM, Jones MR, Ngo AL, Manchikanti L, Kaye AD, Viswanath O. A Comprehensive Update of Adhesive Capsulitis and Minimally Invasive Treatment Options. Psychopharmacol Bull. 2020 Oct 15;50(4 Suppl 1):91-107. PMID: 33633420; PMCID: PMC7901130.
[62]. Tao MA, Karas V, Riboh JC, Laver L, Garrigues GE. Management of the Stiff Shoulder With Arthroscopic Circumferential Capsulotomy and Axillary Nerve Release. Arthrosc Tech. 2017 Mar 13;6(2):e319-e324. doi: 10.1016/j.eats.2016.10.005. PMID: 28580248; PMCID: PMC5442417.
[63]. Sathe S, Khurana SK, Damke U, Agrawal PV. To compare the effects of maitland mobilization with conventional physiotherapy in adhesive capsulitis. International Journal of Current Research and Review. 2020 Jul.
[64]. Cavalleri E, Servadio A, Berardi A, Tofani M, Galeoto G. The effectiveness of physiotherapy in idiopathic or primary frozen shoulder. A systematic review and meta-analysis. MLTJ MUSCLES, LIGAMENTS AND TENDONS JOURNAL. 2020;10(1):24-39.
[65]. Nakandala P, Nanayakkara I, Wadugodapitiya S, Gawarammana I. The efficacy of physiotherapy interventions in the treatment of adhesive capsulitis: A systematic review. Journal of back and musculoskeletal rehabilitation. 2021 Jan 1;34(2):195-205.
[66]. Noten S, Meeus M, Stassijns G, Van Glabbeek F, Verborgt O, Struyf F. Efficacy of different types of mobilization techniques in patients with primary adhesive capsulitis of the shoulder: a systematic review. Archives of physical medicine and rehabilitation. 2016 May 1;97(5):815-25
[67]. Hussain MA, Premkumar M, Kumar RM, Sundar RS. Effectiveness of Sleeper and Cross Body Stretches and Muscle Energy Techniques for Periarthritis Shoulder: Comparative Study. Indian Journal of Physiotherapy & Occupational Therapy. 2022 Oct 1;16(4).
[68]. Mouleeswari B, Ramana K, Suganthirababu P, Alagesan J. Comparison of Effectiveness of Maitland Mobilization and Muscle Energy Technique in Patients with Periarthritis Shoulder Using SPADI and NPRS. Indian Journal of Physiotherapy & Occupational Therapy. 2024 Jan 2;18.
[69]. Sule K, Rathi M, Palekar TJ, Anwer S. Comparison of conventional therapy versus sleeper stretch with conventional therapy in adhesive capsulitis. Int J Health Sci Res. 2015;5(11):186-92.
[70]. Anwer Z, Kumar S. To study the effectiveness of gd maitland Mobilization versus laser therapy in adhesive capsulities. Int J Physiother Res. 2017;5(5):2371-78.