International Journal of
Recent Innovations in Medicine and Clinical Research
Open Access, Peer Reviewed, Abstracted and Indexed Journal

ISSN: 2582-1075
https://ijrimcr.com/
Volume-2, Issue-4, 2020: 22-29

Effectiveness of Mobilization with Conventional Physiotherapy in Frozen Shoulder: A Systematic Review

Sami S. Almureef[1], Waleed Medhat Ali[2], Sharick Shamsi[3], Mansour Bakheet Al Zahrani[4]

[1,3]Senior Physiotherapist at Prince Sultan Military Medical City, Riyadh KSA
[2]Physiotherapist at Prince Sultan Military Medical City, Riyadh KSA
[4]Physiotherapy Technician at Prince Sultan Military Medical city, KSA
Corresponding Author Email: sshamsi@psmmc.med.sa

Received: September 12, 2020 **Accepted:** October 6, 2020 **Published:** October 12, 2020

Abstract: Background: The term "capsulitis" or "frozen shoulder" refers to a common shoulder condition characterized by the global restriction in the shoulder range of motion in a capsular pattern. The capsular pattern in the shoulder is characterized by most limitation of passive lateral rotation and abduction. **Aim:** To determine the recent research evidences for the effectiveness of mobilization along with conventional therapy in frozen shoulder patients. **Method:** This review includes randomized controlled trails (RCTs). Searching done by Google Scholar, PubMed and Pedro from 2010 to 2019. We used terms like- frozen shoulder, mobilization, manipulation, exercise, shoulder pain and physiotherapy management. **Result**: Present outcomes shows that mobilization along with conventional therapy is effective technique in reducing pain and increasing Range of motion (ROM) in frozen shoulder patients without adverse effects. The search resulted in 50 articles but only 05 articles were selected for the study based on criteria. **Conclusion**: Mobilization program with conventional therapy designed for frozen shoulder treatment can be more effective in increasing shoulder ROM and reducing pain.
Keywords: Mobilization, Frozen shoulder, Exercise, Shoulder pain, Glenohumeral Joint.

Introduction

The name "frozen shoulder" firstly given by Codman in 1934. He described frozen shoulder as a painful shoulder condition of insidious onset that was associated with stiffness in forward elevation, external rotation and difficulty in sleeping on affected side. Naviesar coined term "adhesive capsulitis" in 1945[1]. Adhesive capsulitis, periarthritis, and frozen shoulder are all terms used to describe a painful and stiff glenohumeral joint[2]. Adhesive capsulitis can be defined as a common condition characterized by insidious and gradual inflammation of the glenohumeral joint capsule leading to its contracture and thus resulting in stiffness and loss of shoulder mobility[3]. The prevalence rate has been reported to be 2–5.3%, with individuals commonly affected in the age group between 40 to 70 years[4-8]. Usually this condition is self-limiting which may resolve within 2–3 years but it can extend beyond 3 years in up to 40% of patients[9,10]. According to Smita Bhimrao, Frozen Shoulder or Adhesive Capsulitis is reported to affect 3% to 5% of the general population and up to 20% in people with diabetes. The occurrence of Frozen Shoulder in unilateral shoulder increases the risk of contra lateral shoulder involvement by 5% to 34%[11]. It is generally divided in to 3 stages of symptoms lasting for 30 months.

1. Stage I/freezing stage/painful stage

- ✓ As described by Smita Bhimrao[11] typically lasts for 10 to 36 weeks.
- ✓ Patient presents with spontaneous onset of shoulder pain which is more severe at night and with activities, associated with a sense of discomfort that radiates down the arm.

2. Stage II/ Frozen stage /stiffening stage

- ✓ It lasts for 4 to 12 months.
- ✓ Pain at rest usually diminishes during this stage, leaving the shoulder with restricted motion in all planes.
- ✓ Activities of daily living become severely restricted.
- ✓ When performing the activities, a sharp, acute discomfort, can occur as the patient reaches the restraint of the tight capsule. Pain at night is a common complaint.

3. Stage III/ thawing stage/resolution stage

- ✓ This phase lasts for 5 to 26 months.
- ✓ This stage is characterized by gradual recovery of range of motion.

There are two main types of frozen shoulder idiopathic primary frozen shoulder and secondary frozen shoulder corresponds to traumatic capsulitis or if some other medical condition is present alongside[12].

Goals of treatment for frozen shoulder are pain relief, maintenance of range, and restoring function. Physiotherapy treatment consists of stretching and strengthening exercises, electrotherapy modalities or mobilization which may be applied side by side[13]. Joint mobilization is a form of passive movement in a broad spectrum of exercise used to treat painful and stiff synovial joints. Several forms of mobilization exist and terminology varies among the authorities. The oscillatory movements will be in the direction of the joint's accessory motions which are small spinning, gliding, rolling, or distractive motions that occur between joint surfaces and are essential for normal mobility. An example of an accessory motion at the shoulder would be movement of the humeral head inferiorly as it moves on the glenoid fossa during normal abduction. This gliding motion is necessary for the greater tuberosity of the humerus to pass under the coracoacromial arch and thereby allow full elevation of the arm. Accessory motions can be demonstrated in normal, synovial joints when an examiner passively moves one articular surface while the other is stabilized[2]. Ultrasound therapy (UST) is used to treat frozen shoulder, increases tissue temperature upto 5 cm deep, causing increased collagen tissue flexibility, pain threshold, and enzymatic activity. UST also affect nerve conduction velocity and contractile activity of the skeletal muscle[14]. Therefore, effective treatment that shortens the duration of symptoms and disability has the potential to be of significant value in terms of reduced morbidity and costs[15].

Methods

This review study is performed in accordance to PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses [16].

Search Strategy

The searching was done in PubMed, Google Scholar and PEDro. Keywords like-shoulder pain, mobilization, manipulation, exercise, adhesive capsulitis and physiotherapy management. We included past 10 years articles (mainly RCTs-Randomized controlled trial) published in English language only from 2010-2019. The title and abstracts of all articles in the searches were screened in accordance with the inclusion and exclusion criteria to identify potentially eligible articles. Full texts of potential articles were read and assessed independently by the two reviewers.

Inclusions criteria and Exclusion criteria

Randomized controlled trials of manual physical therapy treatment for shoulder pain of adults 18–80 years of age were considered for review. Only randomized controlled trials were included because this study design is generally considered the highest level of evidence short of systematic reviews/meta-analysis[17]**.** All participants were referred to physical therapy for conservative management of shoulder pain and all interventions were performed by a physical therapist.

Studies were excluded if participants reported or demonstrated any symptoms associated with cervical or thoracic symptoms, arm pain other than the shoulder, or radicular symptoms. Also excluded were studies that reported participants who had undergone surgical management for the present condition or for any condition in the upper quarter including the cervical and thoracic spine less than one year previous, had any evidence of gross instability of the glenohumeral joint, or had a history of traumatic dislocation. The interventions of interest were manual therapy performed by a physical therapist, including low-and high-velocity mobilizations, directed only to the glenohumeral joint without additional joint mobilization to the shoulder girdle, thoracic spine, or cervical spine. Previous studies have shown that treatment to the cervical and/or thoracic spine can be beneficial in treating impingement[18]; therefore, studies that included joint mobilization to these areas were excluded so as not to confound any effects of manual therapy to the glenohumeral joint. Studies that performed manipulation under general anesthesia were also excluded from this review. Finally, articles were chosen if they included at least one of the following outcome measures: active or passive range of motion, a functional outcome measure specific to the shoulder, a quality-of-life measure, and a pain measure.

Quality assessment

Methodological quality of selected articles was assessed using PEDro Scale[19] consisting of 11 questions in two aspects. Criteria 2-9 assess internal validity and criteria 10-11 assess statistical information required to make a study interpretable. Scoring of each question is done in accordance to its existence or nonexistence in the assessed study. The final scoring is done by the addition of all positive answers.

Studies considered of high quality scoring ≥5 (5/10) as stated by Moseley et al[20]. Therefore in our review all included studies scoring ≥5 were found to be of high in methodological quality. The studies were analyzed in PEDro scale by two independent investigators.

Data Analysis

The screening of included articles was done by two independent investigators. The selected articles were analyzed in an organized manner including parameters given: author-year, study design, subjects-age, interventions, study duration, outcome measures, and results. Differences between the investigators were solved by conversation to reach agreement and settled by using Cohen's kappa statistics.

Intervention

Considered experiments are those which involve mobilization, Manipulation, different types of exercise irrespective of strength and durations. Exercises programs included, strengthening exercises, flexibility exercises, stretching exercises.

Results

Studies identified

After implementing the inclusion and exclusion criteria, 50 articles were retrieved using the keywords-Shoulder pain, mobilization, manipulation, exercise, adhesive capsulitis and physiotherapy management. 25 articles were excluded as they were found in more than one database. For eligibility criteria 25 articles were screened. Further 20 articles excluded because either they were not available in full text, objective not available, they did not meet exclusion and inclusion criteria or no control group (Figure 1). Finally, 5 articles were selected by agreement for quality assessment phase.

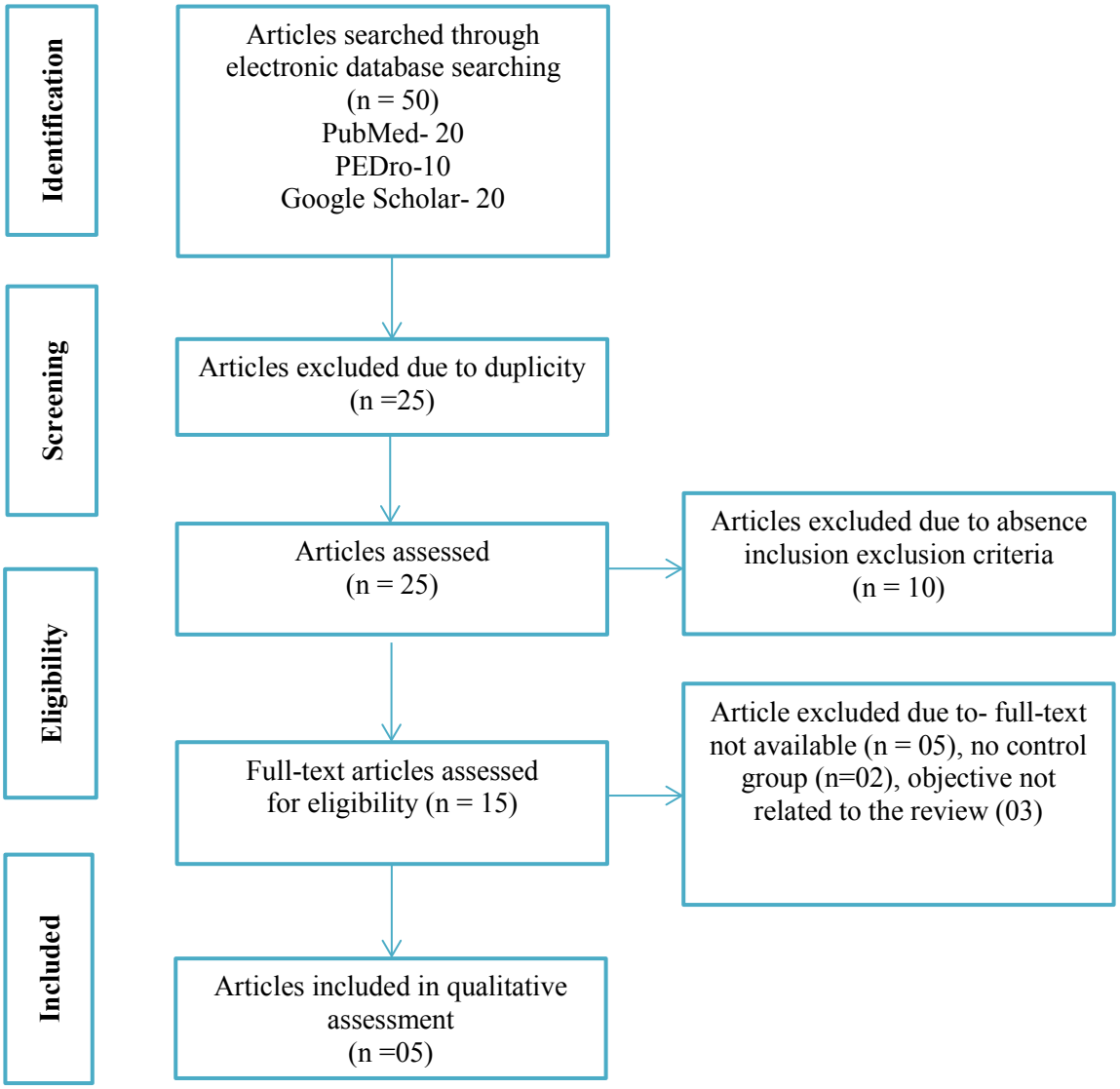

Figure 1. Flow diagram showing the screening and selection of articles

General data of the included studies

Selected articles in this review are summarized in Table 1 including given parameters: author-year, study design, subjects, interventions, study duration, outcome measures, and results. All 5 studies included in this study were RCTs[21-23]. All studies were conducted between 2010 and 2019. Number of participants in the studies ranged from 30 to 60. All articles were experimental. Concerning the effectiveness of results established in the most of the articles, both mobilization and other interventions were found to be significantly effective on pain and function between pre- and post-intervention assessments.

Outcome Measures

The key result tests are Shoulder pain and disability index (SPADI), VAS, shoulder ROM and Goniometry.

Table 1. Description of the included studies

Author	Study design	Subject	Intervention	Study Duration	Outcome measure	Result
Abdullah Al Shehri, Sami S. Almureef et. al. 2018[21]	Randomized controlled trial	N=40	Group A: Maitland mobilization along with Exercises Group B: Ultrasound therapy along with Exercises	Thrice a week for four weeks	Visual analog scale, Shoulder pain and disability index, Goniometry	The result of study suggests that both Maitland Mobilization and Ultrasound improves the symptoms of frozen shoulder. Better improvement was shown by Maitland's group than Ultrasound group. Based on these results Maitland mobilization with Exercise's should be the treatment of choice for frozen shoulder rather than Ultrasound with Exercises.
Abhay Kumar, Suraj Kumar et al. 2012[13]	Randomized controlled trial	N=40	Group A: Maitland mobilization technique and common supervised exercises Group B: Only received common supervised exercises	Four weeks	Shoulder pain and disability index (SPADI), VAS and shoulder ROM (external rotation and abduction)	The study confirmed that addition of the Maitland mobilization technique with the combination of exercises have proved their efficacy in relieving pain and improving R.O.M. and shoulder function and hence should form a part of the treatment plan.
Sharick Shamsi, Waleed Medhat Ali et al. 2019[22]	Randomized controlled trial	N=30	Group A: Mulligan mobilization along with exercises Group B: Ultrasound therapy along with Exercises	12 sessions for 4 weeks	Visual analog scale, Shoulder pain and disability index, Goniometry	The result of study suggests that both Mulligan and Ultrasound improves the symptoms of frozen shoulder. Better improvement was shown by Mulligan group than Ultrasound group. Based on these results Mulligan mobilization with Exercises should be the treatment of choice for frozen shoulder rather than Ultrasound with Exercises.
R. K. Minerva, Nityal Kumar Alagingi et al. 2016[23]	Randomized controlled trial	N=60	Group-A: Maitland mobilization technique and common supervised exercises Group-B: Mulligan mobilization and conventional exercises.	12 sessions for 4 weeks	Shoulder pain and disability index (SPADI) and shoulder range of motion (external rotation and abduction)	Result showed that Mulligan mobilization is more effective than Maitland mobilization in reducing pain and improving shoulder functional ability in subjects with adhesive capsulitis of shoulder.
Smita Bhimrao Kanase, S.	Randomized controlled trial	N=32	Group-A: (Experimental group)	Thrice a week for four	VAS, SPADI, ROM	Maitland mobilization with Kinesiotaping along with conventional therapy

Shanmugam 2014[11]			Maitland mobilization and Kinesiotaping Group-B: (Control group) Maitland mobilization	weeks		improves the pain and disability in patients with frozen shoulder.

Discussions

This review was conducted to determine the efficacy of mobilization approaches in improving quality of life in patients with frozen shoulder. Evidences from RCTs are used to assess the efficacy of mobilization approaches in frozen shoulder. A secondary purpose was to explore the individual value of specific mobilization techniques. In terms of improving shoulder mobility, the evidence suggests that patients receiving manual therapy interventions for shoulder pain will demonstrate improvements in range of motion (ROM).

All Five included studies[21-23] demonstrated improvement in either active or passive range of motion and reducing pain. Although the optimal form of manual therapy technique cannot be identified from the existing literature, there does seem to be preliminary evidence to support selected types of positioning techniques.

Abdullah Al Shehri et al. found on his study that both Maitland Mobilization and Ultrasound improves the symptoms of frozen shoulder. But better improvement was found by Maitland's group than Ultrasound group. As per Al Shehri study mobilization with ultrasound therapy is better choice of treatment in improving pain as well as ROM[21]. Another research done by Abhay Kumar et al. confirmed that addition of the Maitland mobilization technique with the combination of exercises have proved their efficacy in relieving pain and improving R.O.M. and shoulder function[13].

One more study done by Sharick Shamsi et al. found that both Mulligan and Ultrasound improves the symptoms of frozen shoulder. But better improvement was shown by mulligan group than ultrasound group. As per Shamsi et al. study mobilization with ultrasound therapy is better choice of treatment in improving pain as well as ROM[22]. As per Minerva et al. Mulligan mobilization along with supervised exercise is more effective than Maitland mobilization in reducing pain and improving shoulder functional ability in subjects with adhesive capsulitis of shoulder[23].

One more study done by Smita Bhimrao Kanase et al. also found Maitland mobilization with Kinesiotaping along with conventional therapy improves the pain and disability in patients with frozen shoulder[11].

Do Moon et al. compared the Maitland and Kaltenborn mobilization techniques and found significant differences in pain and the ROM of both internal and external shoulder rotation pre-and post-intervention in the Maitland and Kaltenborn groups; however, there were no significant differences when the groups were compared for outcome measures[24].

Range of motion exercises also contribute in improving joint and soft tissue mobility and decreases risk of adhesions and contracture formation. Stretching exercises given as home Programme 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[25,26].

Ketan Bhatikar et al. in his study also gave Maitland mobilization along with conventional physiotherapy treatment had a positive effect on pain and joint range of motion[27].

Sengpya Phukon et al. conducted a study and the results of the study, shows that both Maitland mobilization and METS are effective in improving the ROM and decrease in pain in patient with adhesive capsulitis[28].

Conclusion

This systematic review was conducted to investigate the effectiveness of mobilization along with combination therapy to improve pain and ROM in frozen shoulder patients by summarizing the evidences from randomized controlled trials (RCTs). We conclude that mobilization along with traditional physiotherapy program designed for frozen shoulder treatment can be more effective at increasing shoulder ROM and reducing pain. In addition, frozen shoulder patients can improve self-reported with strengthening exercises including ROM exercises, either with or without electrotherapy.

Conflicts of interest

There are no conflicts of interest.

References

1. Dias R, Cutts S, Massoud S. Frozen shoulder. BMJ. 2005;331(7530):1453-6.
2. Nicholson GG. The effects of passive joint mobilization on pain and hypomobility associated with adhesive capsulitis of the shoulder. J Ortho Spor Phys Ther. 1985;6(4):238-46.
3. Neviaser TJ. Intra-articular inflammatory diseases of the shoulder. Instr Course Lect. 1989;38:199-204.
4. Aydeniz A, Gursoy S, Guney E. Which musculoskeletal complications are most frequently seen in type 2 diabetes mellitus?. J Int Med Res. 2008;36(3):505-11.
5. Bridgman JF. Periarthritis of the shoulder and diabetes mellitus. Ann Rheum Dis. 1972;31(1):69-71.
6. Lundberg BJ. The Frozen shoulder: clinical and radiographical observations the effect of manipulation under general anesthesia structure and glycosaminoglycan content of the joint capsule local bone metabolism. Acta Orthop Scand. 1969;40(sup119):1-59.
7. Pal B, Anderson J, Dick WC, Griffiths ID. Limitation of joint mobility and shoulder capsulitis in insulin-and non-insulin-dependent diabetes mellitus. Rheumatol. 1986;25(2):147-51.
8. Mao CY, Jaw WC, Cheng HC. Frozen shoulder: correlation between the response to physical therapy and follow-up shoulder arthrography. Arch Phys Med Rehabilit. 1997;78(8):857-9.
9. Cyriax J. Textbook of Orthopedic Medicine, 8th ed. London: Baillère Tindall;1982.
10. Shaffer B, Tibone JE, Kerlan RK. Frozen shoulder. A long-term follow-up. JBJS. 1992;74(5):738-46.
11. Kanase SB, Shanmugam S. Effect of Kinesiotaping with Maitland mobilization and Maitland mobilization in management of frozen shoulder. IJSR. 2014;3(9):1817-21.
12. Wolf JM, Green A. Influence of comorbidity on self-assessment instrument scores of patients with idiopathic adhesive capsulitis. JBJS. 2002;84(7):1167-73.
13. Kumar A, Kumar S, Aggarwal A, Kumar R, Das PG. Effectiveness of Maitland Techniques in idiopathic shoulder adhesive capsulitis. Int Scholar Res Notices. 2012;2012.
14. Ansari SN, Lourdhuraj I, Shah S, Patel N. Effect of ultrasound therapy with end range mobilization over cryotherapy with capsular stretching on pain in frozen shoulder-a comparative study. Int J Curr Res Rev. 2012;4(24):68-73.

15. Buchbinder R, Youd JM, Green S, Stein A, Forbes A, Harris A, Bennell K, Bell S, Wright WJ. Efficacy and cost-effectiveness of physiotherapy following glenohumeral joint distension for adhesive capsulitis: A randomized trial. Arth Care Res. 2007;57(6):1027-37.

16. David M, Alessandro L, Jennifer T, Douglas GA, PRISMA Group, Reprint-Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. Physical Therapy 2009;89(9):873-880.

17. Sacket BL, Strauss SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-Based Medicine: How to Practice and Teach EB. 2nd ed. Edinburgh, Scotland: Churchill Livingston, 2000.

18. Winters JC, Sobel JS, Groenier KH, Arendzen HJ, Meyboom-de Jong B. Comparison of physiotherapy, manipulation, and corticosteroid injection for treating shoulder complaints in general practice: randomised, single blind study. BMJ. 1997;314(7090):1320-1325.

19. Maher CG, Sherrington C, Herbert RD, Moseley AM, Elkins M. Reliability of the PEDro scale for rating quality of randomized controlled trials. Phys Ther. 2003;83(8):713-21.

20. Moseley AM, Herbert RD, Sherrington C, Maher CG. Evidence for physiotherapy practice: a survey of the Physiotherapy Evidence Database (PEDro). Aust J Physiother. 2002;48(1):43-9.

21. Al Shehri A, Almureef SS, Khan S, Shamsi S. Efficacy of Maitland Mobilization in Frozen Shoulder. Europ J Biomed Pharma Sci. 2018;5(12):22-27.

22. Shamsi S, Ali WM, Al Ghamdi AH, Khan S, Yadav A. Efficacy of Mobilization in Adhesive Capsulitis. Airo Int Res J.2019;18(2):1-7.

23. Minerva RK, Alagingi NK, Patchava A, Chaturvedhi P. To Compare the Effectiveness of Maitland versus Mulligan Mobilisation in Idiopathic Adhesive Capsulitis of Shoulder. Int J Health Sci Res. 2016;6(2):236-44.

24. 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. J Phys Ther Sci. 2015;27(5):1391-5.

25. Kisner C, Colby LA. Therapeutic Exercise: foundations and techniques. 4th ed. FA Davis Company,2002.

26. Maitland GD: Peripheral Manipulation, 3rd ed. Boston: Butterworth Heinemann, 1991.

27. Bhatikar K, Bhodaji S. Effect of Maitland Mobilization on Radiotherapy Induced Frozen Shoulder: A Case Report. Int J Phys Med Rehabil. 2018;6(458):2.

28. Phukon S, Sowmya MV, Sujata B, Kalaiselvan A. A comparative study between the efficacy of Maitland mobilization and muscle energy techniques in stage ii shoulder adhesive capsulitis. Int J Med Health Res. 2017;3(5):39-42.

Citation: Almureef SS, Ali WM, Shamsi S, Al Zahrani MB. Effectiveness of Mobilization with Conventional Physiotherapy in Frozen Shoulder: A Systematic Review. Int J Rec Innov Med Clin Res. 2020;2(4):22-29.