

Original article

Effectiveness of Multimodal Exercise Strategies on Subjects with Shoulder Subluxation

Balu Manohar R¹, Senthil P^{2*}

¹MPT student, School of Physiotherapy, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Chennai.

²Associate Professor, School of Physiotherapy, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Chennai.

*Corresponding author – Dr. P. Senthil, MPT (Cardio), PhD,
Associate Professor, School of Physiotherapy,
Vels Institute of Science, Technology and Advanced Studies (VISTAS), Chennai.
Email: nithar_1@yahoo.com

Chettinad Health City Medical Journal 2021; 10(4): 190 – 193

DOI: [https://doi.org/10.36503/chcmj10\(4\)-06](https://doi.org/10.36503/chcmj10(4)-06)

Abstract

Objective: To find out the effectiveness of multi-modal exercise strategies on subjects with anterior shoulder subluxation. **Study Design:** Quasi experimental study, Patient Specific Functional Scale, Rowe's Score for Instability. **Method:** The twenty male participants with the aged 25 – 35 with anterior shoulder subluxation selected according to the inclusion and exclusion criteria, participants were divided into 2 groups: Group 1 received ROM and strengthening exercises and proprioceptive exercises & Group 2 received ROM, strength training. The Shoulder range of motion (ROM) are measured using goniometer. The experimental group 1 (n=10) performed ROM and strengthening and advanced proprioceptive exercises, while experimental group 2 (n=10) performed ROM and strengthening exercises. Patients were evaluated before and after intervention which lasted for twelve weeks. Both the groups were tested for instability by the ROWE score and functional and sporting activities to re-gain the neuromuscular control of the shoulder. **Result:** After analyzing with these scales, this study we find that both the groups increased in Joint Positioning Sense (JPS) score. The mean range of motion of the affected shoulder was significantly increased functional activity, Joint Stability and mobility have distinctly increased for group 1 subjects compared to group 2. Recurrence rates post rehab for Group 1 is nil. **Conclusion:** Advanced Proprioceptive Exercises Findings, post 12 weeks of rehabilitation shows that JPS, Joint stability, ROM – Internal rotation & esp. External rotation improved compared to GROUP 2. Advanced Proprioceptive Exercises Findings are more effective progress towards functional and sporting activities to re-gain the neuromuscular control of the shoulder.

Keywords: Shoulder, Proprioception, Joint position sense, Shoulder subluxation, advanced proprioceptive exercise.

Introduction

Shoulder subluxation is a partial displacement of the glenohumeral articular surface¹. The weakness of rotator cuff muscles or laxity of the glenohumeral ligaments causes the humeral head to easily slip out of the glenoid fossa and results in glenohumeral subluxation. The shoulder is one of the easiest joints to dislocate because it's very mobile. That mobility allows you to swing your arm all the way around, like to throw a softball pitch. Throwing too rapidly or forcefully can cause the joint to sublux, but often this injury happens after years of repeated

use. In a subluxation, the bone can shift forward, backward, or downward. Sometimes the injury also tears muscles, ligaments, or tendons around the shoulder joint. Proprioception exercise stimulates the body awareness with the movement training which is very important for each routine day activities². Proprioception provides stability to the joints in your body and shoulder movement awareness is important for arm and hand function to fulfill the daily routine activities. Any injury can reduce proprioception. This can lead to compensation on other structures and in turn lead to injury. Shoulder

proprioception has gained attention, especially in rehabilitation of instability of the shoulder. Anterior instability performed more poorly on JPS testing with the involved shoulder than the uninvolved shoulder. Proprioception exercise has been recommended for improvement in neuromuscular control in individual with shoulder instability³. Proprioceptive training may improve the musculoskeletal systems ability to give appropriate feedback to the Central Nervous System.

Materials and Methods

A quasi-experiment is an interventional study design used to estimate the causal impact of an intervention on target subjects without random assignment. About 20 male participants with the aged 25 – 35 with anterior shoulder subluxation participants are divided into 2 groups: Group 1 received Range of motion (ROM) and strengthening exercises and proprioceptive exercises & Group 2 received ROM, strength training. Goniometry measurements for shoulder range of motion (ROM) are taken. The subject's functional ability are assessed at baseline and post-intervention using the patient specific functional scale⁴ and shoulder instability are assessed at baseline and post-intervention using the Rowe scores⁵.

Shoulder Rehabilitation

Once the shoulder has recovered to its normal position in its socket, is the beginning of rehabilitation process, this can take up to a year to complete⁶. Phase 1 (2 – 4 weeks) – the poly sling will keep your shoulder comfortable (worn for 2 weeks). Gentle movements given to the arm to reduce stiffness and relieve pain. Phase 2 (4 – 8 weeks) – Increase the ROM and the muscle strength. Phase 3 (8 – 12 weeks) – progress towards functional and sporting activities to re-gain the neuromuscular control of the shoulder. Phase 1 – Group 1 & 2 (2 – 4 weeks). Active assisted exercises like Shoulder flexion, Abduction, Medial/Lateral rotation are given to both the groups.

Phase 2 – Group 1 & 2 (4 – 8 weeks)

Main focus is to improve further improvement of ROM and muscle strength. To establish re-balance in your muscle, especially your rotator cuff. The scapula is supported by 2 important muscles – Trapezius and Serratus anterior, these have to be strong to control the shoulder blade and as the shoulder joint moves. Group 1 – Static strengthening and mobility exercises, & early proprioceptive exercises. Group 2 – Static strengthening exercise and mobility exercises.

Phase 3 – (8 – 12 weeks)

Group 1: Static strengthening and mobility exercises and advanced proprioceptive exercises.

Group 2: Strengthening and mobility exercises

Group 2

Phase 1 – (2– 4 weeks) Similar exercise are given for both the groups.

Phase 2 (4 – 8 Weeks)

Static strengthening exercises, strengthening exercises like weight bearing and TheraBand and mobility exercises are given like shoulder flexors, adductors, extensors, internal rotators, shoulder abductors, external rotators. Scapular setting exercises – training Lower trapezius – in prone and standing, serratus anterior

Group 2 – Phase 3 (8 – 12 Weeks)

Strengthening exercises using strong resistance theraband, dumbbells, wall pushups are trained.

Group – 1. Phase 2 (4 – 8 weeks)

Mobility & Early proprioceptive exercises were given to the affected arm by asking the subjects to move the arm forward and backward freely in the elevated surface support and can be repeated with forearm support also. As a progression, the subjects are asked to do pendular movement in all direction and they can able to weight shift their affected arm on the exercise ball and ask them to move in circular manner.

Group 1 – (8 – 12 Weeks)

Advanced Proprioceptive exercises : There are few examples of proprioceptive exercises given below. Kneel on your hands and knees. Raise your unaffected arm and then lower. Repeat the exercise.

Progressions: Raise your unaffected arm and the opposite leg. Repeat in Kneel on your hands and knees with your affected hand on a balance board or exercise ball.

Progressions: Both palm on balance board or exercise ball, kneeling press-ups, Hold for 10 seconds. Repeat in Assume a press-up position with your affected hand on a wobble board/wobble cushion/bosu ball.

Progressions: Both palm on balance board or exercise ball, holding for 10 seconds. Repeat in a side 'plank' position with the affected hand support and hold for 10 seconds. Ask the subjects to their affected hand .

in 90° forward elevation on top of the ball with your shoulder and ask them to move the ball in circle position and do for 10 repetitions in clock-wise and anti-clockwise. Ask the subjects to do the holding of two footballs stably for 10 sec with 10 repetitions.

Progression – use smaller balls: Point at the center of the target below with your arm outstretched. Close your eyes, and then make small circular motions with your arm. Try to stop with your finger pointing at the center of the

target. Now open your eyes to check your final position. Repeat 10 times. Goal: Keep working until you can consistently finish pointing at the center of the target with your eyes still closed.

Results: The progression of Shoulder range of motion from baseline to 12 weeks of post intervention are measured using the goniometer. Similarly, the baseline and post 12 weeks of intervention, Shoulder stability was measured using the Rowe Score.

Table 1 – Shoulder ROM progression

No of weeks	Flexion	Extension	Abduction	Internal Rotation	External Rotation
4 th week	0 - 50	0 - 10	0 - 30	0 - 60	0 - 10
8 th week	0 - 120	0 - 20	0 - 70	0 - 70	0 - 30
12 th week	0 - 180	0 - 50	0 - 160	0 - 80	0 - 90

Table 2 – Shoulder ROM progression

No of weeks	Flexion	Extension	Abduction	Internal rotation	External Rotation
4 th week	0 - 40	0 - 10	0 - 20	0 - 60	0 - 10
8 th week	0 - 100	0 - 20	0 - 50	0 - 60	0 - 20
12 th week	0 - 150	0 - 40	0 - 120	0 - 70	0 - 60

Table 3 – Average ROM of the Shoulder post rehab (12 weeks)

Shoulder movement (ROM)	Group 1 (Proprioception)	Group 2 (Strengthening)
Flexion	180	150
Extension	50	40
Abduction	160	120
Internal Rotation	80	70
External rotation	90	60

Rowe score – Post rehab 12 weeks

Group 1: The Rowe Score for Instability is 90

Group 2: The Rowe Score for Instability is 75

After analyzing with these scales, this study we find that both the groups increased in JPS score. The mean range of motion of the affected shoulder was significantly increased. Functional activity, Joint Stability and mobility have distinctly increased for group 1 subjects compared to group 2.

Reoccurrence rates post rehab for Group 1 is nil.

CONCLUSION: Advanced Proprioceptive exercises intervention for 12 weeks shows that joint position sense, joint stability, internal and external shoulder rotation movement are much improved when compared to routine strengthening exercises.

References

1. Eljabu W, Klinger HM, von Knoch M. The natural course of shoulder instability and treatment trends: a systematic review. *J OrthopTraumatol.* 2017;18(1):1-8. doi:10.1007/s10195-016-0424-9.
2. Jia Han, Gordon Waddington, Roger Adams, Judith Anson, Yu Liu, Assessing proprioception: A critical review of methods, *Journal of Sport and Health Science*, Volume 5, Issue 1, 2016, Pages 80-90, ISSN 2095-2546, <https://doi.org/10.1016/j.jshs.2014.10.004>.

3. Salles, J. I., Velasques, B., Cossich, V., Nicoliche, E., Ribeiro, P., Amaral, M. V., & Motta, G. (2015). Strength training and shoulder proprioception. *Journal of athletic training*, 50(3), 277–280. <https://doi.org/10.4085/1062-6050-49.3.84>.
4. Hefford C, Abbott JH, Arnold R, Baxter GD. Hefford C, et al. The patient-specific functional scale: validity, reliability, and responsiveness in patients with upper extremity musculoskeletal problems *J Orthop Sports Phys Ther*. 2012 Feb;42(2):56–65. doi: 10.2519/jospt.2012.3953.
5. Jensen KU, Bongaerts G, Bruhn R, Schneider S. Not all Rowe scores are the same! Which Rowe score do you use?. *Journal of shoulder and elbow surgery*. 2009 Jul 1;18(4):511–4.
6. Riemann BL, Lephart SM. The Sensorimotor System, Part II: The Role of Proprioception in Motor Control and Functional Joint Stability. *J Athl Train*. 2002 Jan;37(1):80–4. PMID: 16558671; PMCID: PMC164312.

How to cite this article: [Balu M R, Senthil P. Effectiveness of Multimodal Exercise Strategies on Subjects with Shoulder Subluxation. Chettinad Health City Medical Journal 2021; 10\(4\):190–193](#)