



EFFECTIVENESS OF BOX TAPING VERSUS STRETCHING AND STRENGTHENING OF ANTERIOR SHOULDER STRUCTURES ON PAIN, ROM AND SCAPULAR POSITION IN SUBJECTS WITH ROUNDED SHOULDERS

Physiotherapy

**Dr. B. Swarna
Rekha***

(MPT in Orthopaedics), College of Physiotherapy, SVIMS *Corresponding Author

**Dr. S. Raghava
Krishna**

MPT (Orthopaedics), Tutor, College of Physiotherapy, SVIMS

**Dr. K. Senthil
Kumar**

MPT (Orthopaedics), Ph.D., Assistant Professor, college of Physiotherapy, SVIMS

Dr. C. Shanthi

MPT (Orthopaedics), Ph.D., Assistant Professor, college of Physiotherapy, SVIMS

Dr. K. Madhavi

MPT(CT), Ph.D., Professor & Principal, College of Physiotherapy, SVIMS

ABSTRACT

Background: Young adults have typically bent posture due to life style changes, use of mobile phones with abnormal posture leading to muscular imbalance. There is increased protraction, upward rotation and anterior tilt of scapulae in rounded shoulders. The purpose of the study is to compare the effectiveness of box taping with stretching and strengthening of anterior shoulder structures on pain, ROM and scapular position in subjects with Rounded shoulders posture. **Aim and Objectives:** To find out the effect of box taping vs stretching and strengthening in subjects with rounded shoulders posture. This study evaluates the VAS score, shoulder extension ROM, acromial and T3 distance in subjects with Rounded shoulders posture. **Methodology:** A total of 30 subjects with rounded shoulders were selected and randomly divided into 2 group, 15 members in GROUP A (stretching and strengthening) and GROUP B (box taping and stretching and strengthening). Both groups received intervention 3 sessions per week, for 5 weeks. The outcome measures of pain was measured by VAS, shoulder extension ROM by universal goniometer, scapular position by acromial and T3 distance by inch tape in centimeters. **Result & Conclusion:** The subjects in GROUP B has shown more improvement in pain, shoulder extension ROM, acromial distance, T3 distance than the subjects in GROUP A. The present study concluded, box taping with stretching and strengthening is effective in the reducing the Rounded shoulders posture.

KEYWORDS

Rounded Shoulder Posture, Acromial And T3 Distance, Kinesio Taping.

INTRODUCTION

Musculoskeletal balance is thought to be achieved by maintaining proper posture which reduces the amount of tension and pressure on the body. A deviation from the standard alignment indicates the existence of an imbalance as well as unusual strain and pressure on the musculoskeletal system^[1]. Static contraction of the neck and shoulder to oppose the weight of the head is one of the causative elements for upper quarter dysfunction^[2].

In rounded shoulders posture there is increased protraction, upward rotation and anterior tilt of scapulae^[3]. Rounded shoulders results from the shoulder being pulled forward by shortened or tight anterior shoulder girdle muscles, like pectoralis minor, pectoralis major and upper trapezius muscle will abduct the scapula, allowing for lengthening and weakness of rhomboids and lower trapezius^[4]. The etiology of rounded shoulders has been attributed to several factors, posture and relative alignment of body segments. The prevalence of rounded shoulders is 73% in young adults 20 to 50^[5]. In rounded shoulders scapula goes abduction and elevation giving the appearance of a hollow chest. A protracted, downward-rotated anteriorly – tipped scapula position with increased cervical lordosis and upper thoracic kyphosis is known as rounded shoulder posture^[6]. The serratus anterior, pectoralis major, and upper trapezius muscles are tightened and the middle and lower trapezius muscles will become weak in rounded shoulders posture^[6].

There are different treatments for rounded shoulders (RSP) which are strengthening of lengthened muscles and stretching of shortened muscles, soft tissue mobilizations, postural correction exercises^[7].

Among the conservative treatment use of various kinesio-taping technique for postural correction is increasing^[8]. Kinesio-taping is thought to alter the scapula's resting position and help the stability of proximal shoulder girdle needed to conduct the arm elevation^[9]. Its elastic quality helps to support or inhibit muscle function, support joint structure, reduce soft tissue inflammation and provides benefits to sensorimotor and proprioceptive system which helps in adjusting misalignment of musculoskeletal structures and correcting postural abnormalities^[10]. Box taping is one of the scapular taping techniques explained to correct the scapular position^[11].

Need Of The Study

There are many conservative treatments for rounded shoulder posture which are strengthening of lengthened muscles and stretching of shortened muscles, soft tissue mobilizations, postural correction exercises.

Most of the studies done on effect of stretching and strengthening on rounded shoulders and few studies are available on box taping on patients with Rounded shoulders posture. Hence this study is conducted to find out the effectiveness of Box taping with stretching and strengthening on patients with Rounded shoulders posture.

Aim Of The Study

To study the effectiveness of Box taping vs stretching and strengthening of anterior shoulder structures on pain, ROM and scapular position in subjects with Rounded shoulder posture.

Objectives Of The Study

- To compare the effectiveness of box taping vs stretching and strengthening on pain by using VAS score in subjects with Rounded shoulders posture.
- To compare the effectiveness of box taping vs stretching and strengthening by measuring shoulder ROM with universal goniometer in subjects with Rounded shoulders posture.
- To compare the effectiveness of box taping vs stretching and strengthening on scapular position by measuring the acromial and T3 distance with inch tape (in centimeters) in subjects with Rounded shoulders posture.

MATERIALS & METHODOLOGY

MATERIALS: Inch tape, adhesive tape.

a) METHODOLOGY:

Study design: Randomized prospective study design

Study duration: 11 months (January to November 2023)

Sample collection & Study setting: college of physiotherapy, Sri Venkateswara Institute of Medical Sciences (SVIMS).

Sampling method: Simple random sampling.

Sample size: 30samples.

Ethical approval: The present was approved by Institution ethics committee (IEC) of SVIMS wide reference number 1544/2023 Tirupati.

Inclusion Criteria

- Subjects with bilateral rounded shoulders
- Age –20 –40years
- Gender –both males and females

Exclusion Criteria

- Subjects with unilateral rounded shoulder
- Any upper extremity trauma or surgery
- Neurological deficits in upper limb
- Age below 20 years and above 40 years
- Any allergic reaction to tape

Outcome Measures

- Pain by using VAS scale
- ROM by using universal goniometer
- Acromial distance by using inch tape in centimeters. The participants in supine lying and the distance between the posterior border of acromion and table was measured.
- T3 distance by using inch tape in centimeters. This test was performed in standing position. the participant instructed to stay relaxed . The horizontal distance from the T3 spinous process to the medial border of the scapula was measured

Study Methodology

All the subjects who met the inclusion criteria and willing to participate in the study were recruited informed consent is taken before starting the procedure. A total of 30 subjects was screened for Rounded shoulders. Each group will be divided into 15 subjects by lottery method. GROUP –A (Standard treatment- stretching and strengthening) GROUP– B (Boxtaping with stretching and strengthening). All subjects received treatment for 20 minutes per session, 1 session per day, 3 sessions per week, for 5 weeks . Subjects will be instructed to maintain the tape for about 4 hours/session. Outcome measures for scapular alignment will be taken pre-treatment and repeated after the 15th treatment sessions.

Procedure:

- Stretching of Anterior shoulder muscles i.e. pectoralis major , pectoralis minor upper trapezius first 5 sessions include 5 stretches with 30 sec of hold and next 10 sessions include 10 stretches with 30 sec of hold.
- Strengthening of posterior scapular muscles i.e. rhomboids, middle and lower trapezius first 5 sessions include 5 repetitions with 10 sec of hold and next 5 sessions include 10 repetitions with 10 sec of hold. next 5 sessions include 15 repetitions with 10 sec of hold.
- Strengthening of glenohumeral external rotators i.e. infraspinatus and teres minor first 5 sessions include 5 repetitions with 10 sec of hold and next 5 sessions include 10 repetitions with 10 sec of hold. next 5 sessions include 15 repetitions with 10 sec of hold.

Taping technique :

Taping technique used was box taping method. subjects are instructed to fully retract and depress their scapula. Two vertical strands of tape are used to aid with thoracic extension, while two horizontal strips are utilised to bring the medial border of the scapulae together.. One horizontal strip extended from superior angles of one scapula to superior angle of other scapula other horizontal strip extended from inferior angle of one scapula to inferior angle of other scapula. The vertical strips overlapped the horizontal strips.



FIGURE : Box taping

Statistical Analysis & Results

The data is entered into Microsoft Excel for tabulation and analysis. Statistical analysis is carried out by using IBM SPSS 25.0 version software. The paired sample t-test is applied to compare the mean values of all the parameters in both the groups. A p-value of <0.01 will be considered as statistically significant.

Demographic Data

TABLE 1- Categorization of the subjects according to the Age wise in both groups

Age (Years)	Group A		Group B		Total	
	No. of subjects	%	No. of subjects	%	No. of subjects	%
20 - 21	5	33.3	9	60.0	14	46.7
22 - 24	9	60.0	5	33.3	14	46.7
Above 24	1	6.7	1	6.7	2	6.7
Total	15	100.0	15	100.0	30	100.0
Mean Age	22.47 ± 1.36		21.87 ± 2.45		22.17 ± 1.97	

Table 2 : Comparison of pre test and post test values of outcome measures of Group A and Group B

S. NO	Outcome measures	Pretest values Mean ± S.D		Post test values Mean ± S.D		Mean difference		t-value (p-value)	
		Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B
1.	VAS	7.27 ± 0.594	6.73 ± 0.884	3.67 ± 0.724	3.40 ± 0.632	-3.600	-3.333	18.924 (0.000)	15.811 (0.000)
2.	Acromial distance	10.70 ± 1.73	10.88 ± 1.74	8.75 ± 1.18	6.22 ± 0.51	1.947	4.660	10.026 (0.000)	10.193 (0.000)
3.	T3 distance	8.07 ± 0.80	8.35 ± 0.99	7.11 ± 0.51	5.01 ± 0.22	0.960	3.340	9.897 (0.000)	13.562 (0.000)
4.	Shoulder extension ROM	33.20 ± 2.60	33.80 ± 2.60	44.20 ± 2.305	45.80 ± 1.610	-11.000	-12.000	18.924 (0.000)	19.204 (0.000)

The above table shows mean and standard deviation values of VAS , acromial distance , T3 distance and ROM of shoulder extension before and after the treatment in both the groups.

DISCUSSION

Maintaining the good posture has advantages for both mechanical and functional benefits . The soft tissue get lengthened and shortened when body segments are misaligned for extended periods of time. This eventually leads to changes in the ideal joint range, force output, and movement efficiency. Correcting posture and muscular imbalance through muscle strengthening, muscle stretching, taping, and joint mobilisation techniques is the goal of many conservative rehabilitation programmes. The application of taping is helpful for the muscle recruitment, proprioception, pain relief, and improvement of function.

Khushboo S Jangid et al concluded that prevalence of rounded shoulders is 84% in young adults. **Charles Thigpen et al** concluded that individuals with RSP would display less scapular upward rotation as well as greater internal rotation and anterior tilting. Compared to people with optimal head and shoulder posture, those with FHRSP would exhibit less serratus anterior activity, lower trapezius activity, and more upper trapezius activity. During the flexion , people with FHRSP showed increased anterior tilting and scapular internal rotation together with decreased serratus anterior activity during the ascending phase of shoulder flexion.

Ian ahearm et al concluded that suitable scapula to maintain appropriate upper extremity motion, thoracic muscle activation is required for regulating scapulothoracic function. **Stephine K.Kotteswaran et.al** concluded that A 6-week exercise program designed to stretch tight muscles such as the pectoralis major and minor muscles and strengthen weak muscles such as the shoulder flexors, trapezius, shoulder external rotators and shoulder retractors. kinesio tape applies a prolonged stretch to the muscles, which helps with posture.

Yoo Won-Gyu et al concluded that kinesio taping provides biofeedback and mechanical support to maintain optimal head position more effectively than counseling and exercise. Thus, returning the head to a normal position causes compensatory corrections in the distal segment, such rounded shoulder position. **Kase, K concluded** that Kinesio taping restores muscle functions and helps with positioning. It helps immediate increase in muscle length creates a concentric pull on the fascia, which can then stimulate increased muscle mass contraction.

The present study is concluded to compare the effectiveness of box taping and stretching and strengthening with stretching and strengthening on pain, Range of motion and scapular position in subjects with rounded shoulders posture. In this study, the subjects were divided into two groups, GROUP A received stretching and strengthening and GROUP B received Box taping with stretching and strengthening. The subjects who received box taping with stretching and strengthening (GROUP-B) showed a significant improvement in pain reduction, increase in shoulder extension ROM, decrease in acromial distance and T3 distance than the subjects in GROUP A.

CONCLUSION

The present study concluded that Box taping with stretching and strengthening is effective in reduction of pain, increasing the shoulder extension ROM, decreasing the acromial distance and T3 distance in subjects Rounded shoulders posture than the stretching and strengthening alone.

Limitations

- Small sample size
- Short duration study
- Gender in equality

Recommendations

- Long duration follow up may be require to find out the further effect of kinesio taping.
- More combination of other methods with the present study can be done.
- Study can be conducted on large group of population.
- This study may be conducted on individual side.

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