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TAPING FOR LOWER TRAPEZIUS v/s PECTORALIS MINOR ON ROUNDED SHOULDER INDIVIDUALS IN YOUNG ADULTS

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Abstract : **Background**
Rounded Shoulder Posture (RSP) is a prevalent musculoskeletal misalignment among young adults due to prolonged smartphone use and prolonged sedentary sitting. Left uncorrected, RSP alters spinal biomechanics and degrades long-term quality of life. Kinesiology Taping (KT) offers a non-invasive mechanical correction, but comparative evidence regarding muscle facilitation versus muscle inhibition approaches for RSP remains scarce.

Objective

To compare the immediate mechanical efficacy of facilitatory KT on the lower trapezius muscle against inhibitory KT on the pectoralis minor muscle in young adults presenting with RSP.

Methods

- **Design:** Experimental study.
- **Participants:** Thirty young adults (aged 18–40 years) with a supine acromion-to-plinth distance greater than 1 inch were recruited via purposive sampling and randomly allocated into two equal groups ($n = 15$ each).
- **Intervention:** Group A received inhibitory KT on the pectoralis minor muscle, while Group B received facilitatory KT on the lower trapezius muscle. The tape was sustained with mechanical stretch for 48 hours.
- **Outcome Measures:** Bilateral supine acromion-to-plinth distance (in centimeters/inches) was measured at baseline (pre-taping) and at the 48-hour follow-up (post-taping). Intragroup data were analyzed using paired t-tests/Wilcoxon signed-rank tests, and intergroup data were analyzed using an unpaired t-test ($p < 0.05$).

Results

- **Group A (Pectoralis Minor):** Post-taping measurements showed a non-significant reduction in the right shoulder ($p = 0.0578$) but a statistically significant reduction in the left shoulder (5.39 ± 0.77 to 5.05 ± 0.88, $p = 0.0011$).
- **Group B (Lower Trapezius):** Showed highly statistically significant improvements in both the right shoulder (5.47 ± 1.07 to 4.71 ± 0.84, $p = 0.032$) and left shoulder (5.87 ± 0.93 to 4.83 ± 0.93, $p = 0.001$).
- **Intergroup Comparison:** Group B demonstrated a significantly higher mean reduction in acromion-to-plinth distance (1.03 ± 0.66) compared to Group A (0.34 ± 0.32) with a highly significant p-value ($p = 0.001$).

Conclusion

Facilitatory kinesiology taping of the lower trapezius muscle yields superior, more uniform mechanical correction of rounded shoulder posture in young adults compared to inhibitory taping of the pectoralis minor muscle. This indicates that activating the weakened scapular retractors, aided by gravitational assistance, is clinically more effective for immediate postural correction than inhibiting tightened anterior structures.

Keywords: Kinesiology Taping, Rounded Shoulder Posture, Lower Trapezius, Pectoralis Minor, Postural Correction, Sedentary Lifestyle.

INTRODUCTION

Muscular and skeletal structures can change into an incorrect shape due to a reduction in physical activity and inappropriate posture habits in daily living.[1] Forward head posture (FHP) is defined as excessive anterior positioning of the head in relation to a vertical reference line.[2] Rounded shoulder posture (RSP) refers to a

posture characterised by acromion protraction in front of the line of gravity, shoulder protraction, and downward rotation as well as anterior tilt.[3]It leads to flexion posture of spine which increase the amount of of tension on the nerve roots.[9]this can have adverse effects in the long run including spondylosis and spondylolisthesis. this would also affect one's quality life. Also, long-term use of smart phones leads to wrong posture such as forward neck posture, rounded shoulders and slouched posture.[4] Daily tasks that may contribute to rounded shoulders include: using a smartphone or tablet, sitting for long periods, driving a vehicle, bending over repeatedly, carrying heavy objects all day. The study done by Han JT et al. also shows that mechanical correction of RSP can be achieved by the application of kinesiotape.[1] Kinesio tape (KT) is a relatively new form of elastic therapeutic tape that was developed by Dr. Kenzo Kase in the 1970's and is used in the treatment of a variety of injuries.[5] Despite its popularity and widespread clinical use, there are relatively few studies that support the effectiveness of KT for neck and upper extremity conditions.[6]It has been hypothesised that KT may exert its effects by increasing local circulation, reducing local edema by decreasing exudative substances, improving circulation of blood by facilitating muscle, providing a positional stimulus to the skin, muscle, or facial structures, providing proper afferent input to the central nervous system.[7] The KT application techniques include facilitation, inhibition, fascia correction, field correction, functional correction, and mechanic correction techniques. The KT practitioner must decide which muscle group should be treated with which type of technique. The inhibition technique can be used for muscle dysfunction caused by microtrauma or tension.[8]

NEED OF THE STUDY.

Forward head and rounded shoulder posture (FHRSP) is a common clinical postural misalignment. It leads to flexion posture of the spine which increases the amount of tension on the nerve roots.[9]This can have adverse effects in the long run including spondylosis and spondylolisthesis. This would also affect one's quality of life. There are various studies showing positive effects of kinesiotaping and box taping on forward head and rounded shoulder posture in athletes, but there is paucity of literature on effects of kinesiotaping on sedentary lifestyle individuals with rounded shoulder posture.

RESEARCH METHODOLOGY

The methodology section outline the plan and method that how the study is conducted. This includes Universe of the study, sample of the study,Data and Sources of Data, study's variables and analytical framework. The detailsare as follows;

3.1 Population and Sample

Target Population

The target population for this experimental study comprises young adults aged **18 to 40 years** in a community setting who present with postural malalignment, specifically **Rounded Shoulder Posture (RSP)** and associated **Forward Head Posture (FHP)**.

Sampling Method

A **purposive sampling technique** (non-probability sampling) was used to select participants from the community who fulfilled the explicit clinical inclusion and exclusion parameters.

Sample Size and Group Allocation

- **Total Sample Size (N):** 30 participants.
- **Group A (Experimental Group 1):** 15 participants allocated to receive inhibitory kinesiology taping over the **Pectoralis Minor** muscle.
- **Group B (Experimental Group 2):** 15 participants allocated to receive facilitatory kinesiology taping over the **Lower Trapezius** muscle.

Eligibility Criteria

Inclusion Criteria	Exclusion Criteria
Age bracket between **18 and 40 years**.	Presenting with neck or shoulder pain lasting 6 **months**.
Confirmed Rounded Shoulder Posture via standard postural evaluation.	Active skin infections, lesions, or open wounds at the application site.
Baseline **supine acromion-to-plinth distance 1 inch**.	Known **skin allergies or hypersensitivity** to kinesiology tape/acrylic adhesives.

3.2 Data and Sources of Data

Source of Data

This research utilizes **primary quantitative data** gathered via clinical physical measurements from human subjects recruited directly from a community college setting.

Data Collection Instruments & Timeline

- **Measurement Metrics:** Linear distance tracked using a standard medical measuring tape and a geometric set square.
- **Primary Outcome Measure:** The **Supine Acromion-to-Plinth Measurement**. Participants were evaluated in a relaxed supine position on a flat testing plinth. The linear distance between the posterior aspect of the acromion process and the plinth surface was recorded.
- **Data Logging Intervals:** Values were formally logged onto individual *Data Record Sheets* at two distinct milestones:

1. **Pre-Intervention (Baseline):** Recorded immediately prior to tape application.
2. **Post-Intervention (48-Hour Follow-Up):** Recorded exactly 48 hours following continuous tape placement.

3.3 Theoretical Framework

The structural biomechanical foundation of this study is rooted in the **Upper Crossed Syndrome** model of muscle imbalance. Chronic postural habits, such as long-term smartphone use, vehicle driving, and prolonged desk work, promote a slouched flexion posture of the spine.

The Pathomechanics of Rounded Shoulder Posture

- **Anterior Tightness:** The **Pectoralis Minor** muscle adapts to a chronically shortened position, causing acromion protraction, shoulder internal rotation, downward scapular rotation, and anterior scapular tilt.
- **Posterior Weakness:** Concurrently, reciprocal inhibition leads to lengthening and weakness of the scapular stabilizers, specifically the **Lower Trapezius** muscle.
- **Clinical Risk:** This imbalance creates excessive tension on the cervical and thoracic nerve roots. If unmanaged, it can cause long-term degenerative conditions like thoracic spondylosis and spondylolisthesis, ultimately reducing overall quality of life.

Neuro-Mechanical Mechanisms of Kinesiology Taping

Kinesiology tape—engineered with flexible cotton/nylon fibers and acrylic adhesive mimicking **70 - 80** of human skin elasticity—serves as a positional and tactile stimulus to modify muscle activation:

1. **Facilitation Vector (Lower Trapezius):** Applied from **origin to insertion** using a mechanical stretch of **35-40%** The elastic recoil coordinates with cutaneous mechanoreceptors, providing afferent input to the central nervous system to enhance motor unit recruitment. This mechanically pulls the scapula back into retraction and depression.

2. **Inhibition Vector (Pectoralis Minor):** Applied from **insertion to origin** with minimal to no tension. This technique targets muscle tension caused by microtrauma, providing a positional stimulus to reduce muscle overactivity.

This framework tests whether **posterior facilitation** provides a more effective mechanical correction than **anterior inhibition** when assisted by gravity in a supine position.

3.4 Statistical Tools and Econometric Models

Data Processing Infrastructure

All primary quantitative values collected from the master sheets were logged and analyzed using **SPSS (Statistical Package for the Social Sciences)** software. The threshold for statistical significance was pre-established at a P-value of **< 0.05.**

Distribution & Normality Testing

Before choosing inferential statistical models, the data sets were checked for normal distribution to confirm the appropriate mathematical pathway:

- **Group A (Pectoralis Minor):** Both the right and left shoulder datasets followed a normal distribution, calling for a **parametric baseline**.
- **Group B (Lower Trapezius):** The right shoulder dataset followed a normal distribution, while the left shoulder dataset showed a non-normal distribution, requiring **non-parametric testing**.

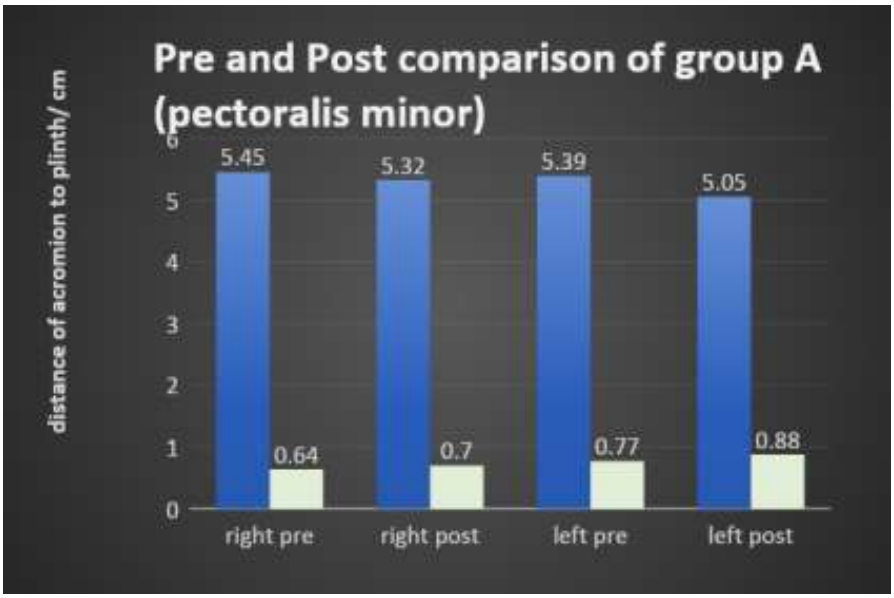
IV. RESULTS AND DISCUSSION

4.1 Results of Descriptive Statics of Study Variables

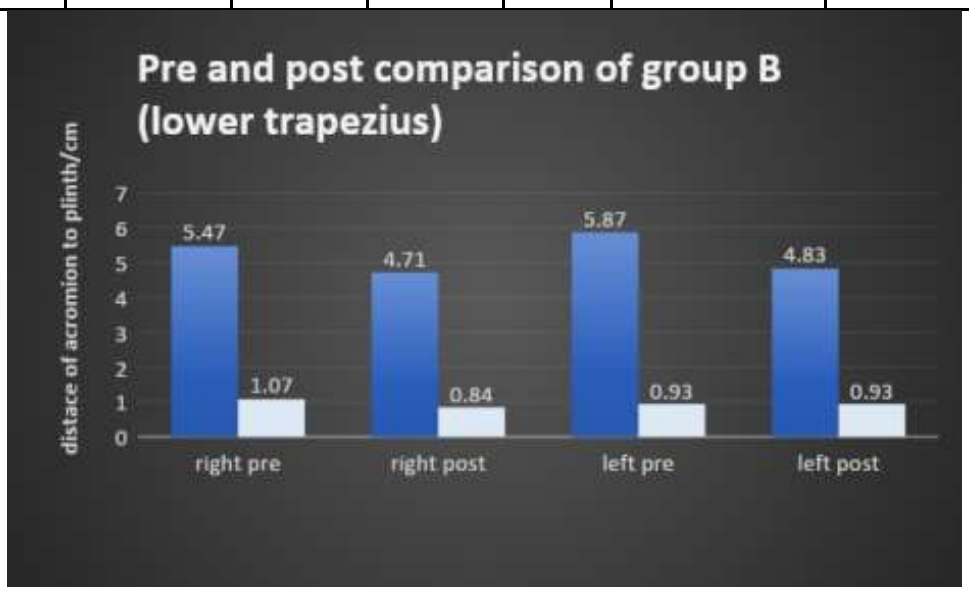
Total number of participants selected were 30. Out of which 15 were allocated in group A and 15 in group B**.** Intragroup analysis for rounded shoulders was done as below. The mean, standard deviation and P value scores were calculated. When intergroup comparison between group A and B was done the P value was significant (0.001).

GROUP A PECTORALIS MINOR:

	PRE MEAN SD		POST MEAN SD		P VALUE	SIGNIFICANCE
RIGHT 5.45		**0.64**	**5.32**	**0.7**	**0.0578**	**Not significant**
LEFT	**5.39**	**0.77**	**5.05**	**0.88**	**0.0011**	**significant**

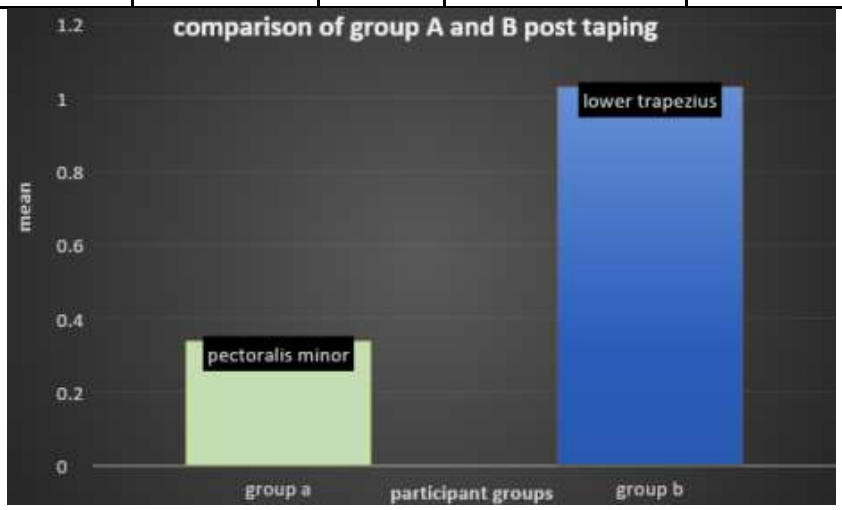


	PRE		POST		PVALUE	SIGNIFICANCE
	MEAN SD MEAN SD		MEAN SD			
RIGHT	5.47	1.07	4.71	0.84	0.032	SIGNIFICANT
LEFT	5.87	0.93	4.83	0.93	0.001	SIGNIFICANT



GROUP A Vs GROUP B

GROUP A	MEAN	SD	PVALUE	SIGNIFICANCE
	0.34	0.32	0.001	SIGNIFICANT
GROUP B	1.03	0.66		



The present study was undertaken to find out the effect of taping of lower trapezius in comparison with pectoralis minor on rounded shoulder individuals in young adults between the age group of 18-40 years.

The study sample consisted of 30 individuals. All the subjects were assessed for the extent of rounded shoulders. The subjects were taped for the specific muscle according to the corresponding allocation of the group.

The data and the results were documented and was subjected to normality and statistical analysis was done.

The findings of the study are:

1. There is no significant difference seen in the extent of rounded shoulders when the pectoralis minor muscle was taped.

2. There is a significant difference seen in the extent of rounded shoulders when lower trapezius was taped.

The result of this study showed that taping of the lower trapezius works better than taping of the pectoralis minor muscle in correcting rounded shoulders in young adult individuals.

Our findings are consistent with the previous studies in which it is proved that there is immediate mechanical correction of RSP (rounded shoulder posture) using taping as an intervention in individuals having RSP.

It is safe to say that muscle can be facilitated along with the postural correction with the aid of taping. In the young adult age group, which I had chosen for my research, there is improvement in the rounded shoulders when the lower trapezius(facilitatory) muscle was taped whereas no improvements were seen when pectoralis minor(inhibitory) muscle was taped. This shows facilitatory technique works better than inhibitory technique due to gravitational assistance in correction of rounded shoulders.

Several articles have found the change in the postural malalignment after the individuals were subjected to taping.

Han JT et al (2015) studied The mechanical effect of kinesiology tape on rounded shoulder posture in seated male worker. A single-blinded randomised controlled pilot study. Fourteen men with RSP, who worked for at

least 7 h/d in a seated position, were selected for RST, with the shoulders randomly assigned to two kinesiology taping methods: (1) with 35–40% stretch of its original length; and (2) without stretch. The PML, supine measurements of RSP, and TSD, before and after kinesiology taping, with and without stretch, were assessed. The study concluded that an immediate mechanical correction of RSP could be achieved by the application
of kinesiology tape with stretch to both the dominant and non-dominant shoulders and the application of kinesiology tape without stretch does not aid in the reduction of RSP. Further studies involving a larger sample size and men and women of all ages are needed to investigate the clinical efficacy of RST in patients with RSP.[(1)]

Arti Kumkumwar et al (2019) studied the Effect of neck retraction taping on rounded shoulder posture in desk workers. The study included 40 individuals who are desk workers having rounded shoulder posture with age 20 – 50 years who were recruited by convenience sampling. Neck retraction taping using two "I" strips placed over upper trapezius and levator scapulae which were kept for 2 days. Pre and post supine measurement of rounded shoulder posture, pectoralis minor length, and normalised scapular abduction ratio was measured using measuring tape. Data was documented pre and post 2 days of intervention and analysed using paired t-test. The study concluded that neck retraction taping provides an alternative way for correction of postural malalignment and musculoskeletal dysfunctions such as rounded shoulder posture by using kinesio tape as an initiator to stimulate proper postural control especially in working time of individuals with sedentary lifestyle. [(4)]

CONCLUSION

The present studies shows that there are positive effects of taping lower trapezius in comparison with taping of pectoralis minor muscle on rounded shoulder individuals

CLINICAL IMPLICATIONS

1. As there was correction of rounded shoulders after taping, this technique can be used in correcting malalignment and help with the problems associated with rounded shoulders such as flexion posture of the thoracic spine which increases the amount of tension on the nerve roots. This would also affect one's quality of life.

2. This research also shows that taping of lower trapezius works better in correcting rounded shoulders.

3. This can be included in the protocol of rounded shoulders

LIMITATIONS

1. The sample size was limited.
2. The age group of the sample was limited to young adults between the age group of 18-40 years.

SUGGESTIONS

1. Larger sample sizes can be taken into consideration.
2. With other interventions like postural correction exercise and strengthening exercises. 3. The age group of the sample was limited to young adults between the age group of 18-25 years.
4. Intervention of taping should be done for more number of days.
5. Rather than randomly allocating the participants the muscle could be taped according to the requirement of the individual

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