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Effects Of Upper Limb And Scapular Stabilization Exercises Versus Elastic Resistance Band Exercises For Trapezitis Among College Students

[1]M.Divya, [2]G.Janamithra, [3]P.Preethi angel

[1]Lecturer, [2] BPT, [3]Lecturer

[1]Dr.MGR educational and research institute,

[11]Dr.MGR educational and research institute faculty of physiotherapy , Chennai, India

ABSTRACT

Aim: This study aims to compare the effectiveness of upper limb and scapular stabilization exercises over the elastic resistance band exercises for trapezitis among college students. Background of the Study: Trapezitis is an inflammation of trapezius muscle, Symptoms of trapezitis include pain, tenderness, stiffness in neck and shoulders, difficulty in moving arms. Poor posture, overuse, or injury can all contribute to the condition. The primary purpose of present experimental study was to prevent pain and help students to write efficiently. Materials and Methods: once the study is approved by institutional review board, 30 students both male and female suffering trapezitis were selected. The study setting was in Chennai. The source population includes male and female, age between 18-25, NPRS score with in 7 and excludes NPRS scale ranging>7, pain in area other than trapezius muscle, history of fracture or dislocation in upper limb, neoplasm, recent surgery. The samples were fully explained about the benefits of participating in the study. They were asked to complete the consent form, which was duly signed by the therapist and the samples. Data regarding pain, speed of writing were collected using NPRS(Numerical Pain Rating Scale) and NDI(Neck Disability Index). Result: The result of this study shows that elastic resistance band exercises was better than upper limb and scapular stabilization exercises in reducing pain and improving speed of writing.

KEY WORDS: Trapezitis, Scapular stabilization, Elastic resistance, band exercises, Upperlimb exercises.

INTRODUCTION

In clinical practice, trapezitis, or inflammation of trapezius muscle, is frequently observed. Headache, lightheadedness, neck pain, and midback pain are most common signs of trapezitis[1,2]. Causes of trapezitis includes overuse of muscles, non-ergonomic posture, repetitive motions, prolonged sitting, Incorrect desk height, long traveling, prolonged head bending(reading, dentistry, mechanics), heavy writing, smartphone use. It may also be brought on by unusual breathing patterns or unpleasant feelings and thoughts [4].Women are more likely than men to be affected in middle-aged population. Prevalence of neck discomfort varies significantly between studies, with a mean lifetime prevalence of 50% and a mean point prevalence of 13%, respectively [5].Areas of soft tissue under stress receive less oxygen, glucose, and nutrients, which leads to

accumulation of excessive amounts of metabolic waste products and eventually develop trigger points [15]. This is the pathophysiology of trapezitis. Trigger points are irritable foci that are accompanied by a nodule or band felt over muscle belly. According to Simon and colleagues' study, taut bands can be identified by "a tender spot on the taut band, referred pain or altered sensation at least 2cm beyond the spot, elicited by pressure held for less than 10 seconds, and sometimes it may restrict cervical ROM"[16].Exercise can help improve circulation and the health of muscles and joints in hands, wrists, and fingers. It may lead to enhanced talent and fine motor skills, which will facilitate regulation of the motions required for writing. Regular exercise can also help to improve posture by strengthening back, shoulders, and core. Maintaining good posture when writing reduce strain on neck and shoulders, thereby reducing pain [17, 18, 19].Stabilization exercises can improve proprioception, balance, reduce functional impairment, and help muscle maintain joint position. Elastic band exercises help muscles grow stronger and improve their range of motion, endurance, and strength by putting stress on load. Thus, the aim of the study is to compare which of these exercises is superior. Additionally, provide an useful exercises to help students with trapezitis

MATERIALS AND METHODS

Once the study is approved by institutional review board, 30 students both male and female suffering trapezitis were selected. The study setting was in Chennai. The source population includes Both male and female, person age group between 18-25, NPRS score with in 7 and excludes NPRS scale>7, pain in area other than trapezius muscle, history of fracture or dislocation in upper limb, neoplasm, recent surgery. The samples were fully explained about the benefits of participating in the study. They were asked to complete the consent form, which was duly signed by the therapist and the samples. Data regarding the pain, speed of writing were collected using the NPRS scale and NDI index. Participants would be selected based on selection criteria and divided into 2 groups.

Group-A

The participants were given ultrasound and upper limb and scapular stabilization exercises(ULSSE).

Group-B

The participants were given ultrasound and Elastic resistance band exercises(ERBE).

The intervention included ULSSE and ERBE for whole upperlimbs in Group-A and Group-B participants, respectively along with ultrasound

ULSSE exercises

Biceps curls, triceps curls, wrist curls, smiley ball squeezes, scapular retraction'Y'position, ball rolls, wall pushups, modified plank press ups.

Duration

Each exercise 15repetition for 3sets/day, 5days/week, for 8weeks.

ERBE exercises

Shrugs, lateral raise, bendover lateral raise, upright rows, wall slides, shoulder press, band pull down, one arm row.

Duration

Each exercise 15repetition for 3sets/day, 5days/week, for 8weeks.

DATA ANALYSIS

The collected data were tabulated and analyzed using both descriptive and inferential statistics. All parameters were assessed using statistical package for social science(SPSS) version 24, with a significance level of p-value<0.05 and a 95% confidence interval set for all analysis. The Shapiro-Wilk test was used to determine normality of data at P>0.05. In this study, Data on the NPRS and NDI score can yield both parametric and non-parametric data depending on context and specific characteristics of dataset. Non-parametric data involves ordinal scales or data that do not meet parametric assumptions; the NPRS and NDI score typically produce non-parametric data due to their ordinal nature and potential non-normal distribution. Hence non-parametric test was adopted into NPRS and NDI score. Wilcoxon-signed-rank test was adopted to find statistical difference within groups & Mann–Whitney U test was adopted to find statistical difference between groups.

P-value and statistical significance:
The P-value with two-tails is<0.001. This difference is deemed to be very statistically significant by traditional standards.

Table-1 shows comparison of post-test values NPRS of group-A & group-B
This table reveals Mean, Z-score, U-value and p-value between pre-test and post-test within Group–A & Group–B.
There is a statistically significant difference between post-test values of Group-A and Group-B(P-value is<0.0001).

Table-2 shows comparison of post-test values NDI of group-A & group-B
This table reveals Mean, Z-score, U-value and p-value between pre-test and post-test within Group–A & Group–B.
There is a statistically significant difference between post-test values of Group-A and Group-B(P-value is<0.0001).
This Group-B table shows that there is significant difference in NDI values between pre-test and post-test(P-value is 0.00064).

TABLE-1

COMPARISON OF POST-TEST VALUES NPRS OF GROUP-A & GROUP-B

Parameter	Post-Test Values		Z-Score	U-value	Significance
	Group-A	Group-B			
	Mean	Mean			
NPRS	3.6	2.3	4.14781	12	<0.0001

GRAPH -1

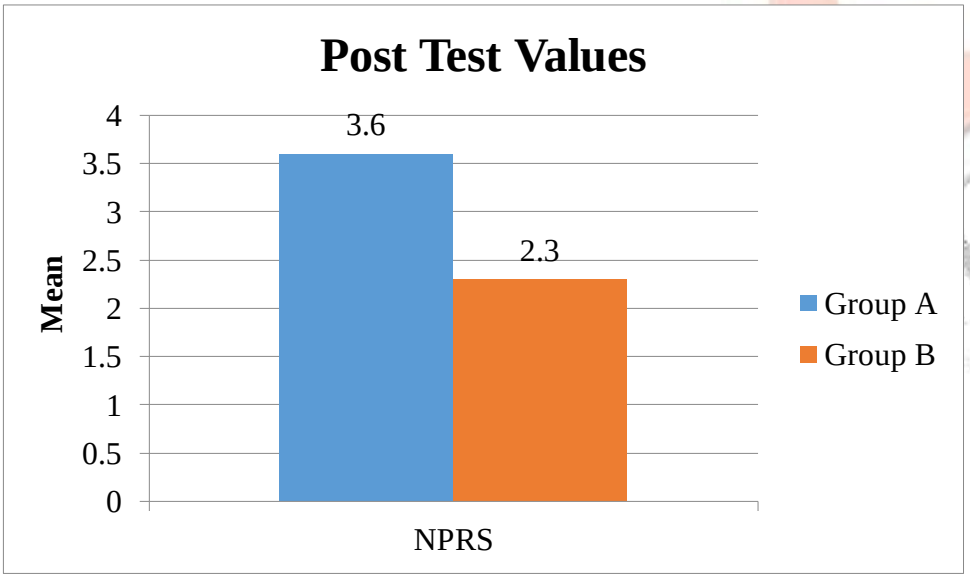
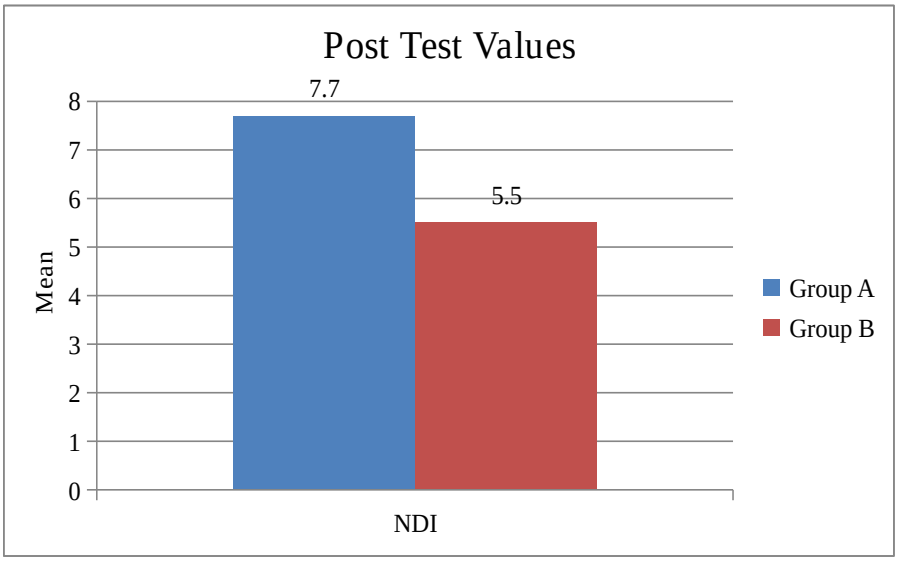


TABLE-2
COMPARISON OF POST-TEST VALUES NDI OF GROUP-A & GROUP-B

Parameter	Post-Test Values		Z-Score	U-value	Significance
	Group-A	Group-B			
	Mean	Mean			
NDI	7.7	5.5	4.39668	6	<0.0001

GRAPH -2:



RESULT

A statistically significant difference between Group-A and Group-B, as well as within each group, was found by statistical analysis of quantitative data. In Group-A pre intervention mean to NPRS was 6.47(±0.52) and NDI scores are 15.87(±0.83). After treating subject with ULSSE the mean value of NPRS was 3.6(±0.51) and NDI scores are 7.73(±0.7), which show statistically significant difference within groups. In Group-B pre intervention mean to NPRS was 6.4(±0.51) and NDI scores are 15.93(±0.8). After treating subject with ERBE, the mean value of NPRS was 2.27(±0.46) and NDI scores are 5.47(±0.74), which show statistically significant difference within groups. The results of post-test statistical analysis for NPRS and NDI showed that there was a significant statistical difference between group-A and B. The research is thus deemed to be statistically significant there by adopting alternative hypothesis since Group-B has large statistical difference than Group-A.

DISCUSSION

The principle finding of present study was that ERBE was significantly more effective than ULSSE in reducing pain and improving speed of writing among college students suffering trapezitis as measured by NPRS and NDI scale. In our study significant decrease was detected in pain and NDI score after training students with both ULSSE and ERBE. But ERBE shows greater effectiveness than ULSSE. It is controversial whether decrease in NDI score is only due to decrease in pain or not. But increase in muscle strength that develop because of strengthening exercises in both groups.

MATHEW LALRUATLIANA, ABHIJIT DUTTA(2021) conducted Study on Effectiveness of Corrective Exercise Over Conventional Exercises in Individuals Suffering from Trapezitis. And concluded both treatment techniques, between Corrective and Conventional were effective in alleviating pain in Trapezitis.

M POORNASHREE, M KAMALAKANNAN, A ANITHA, K RAMANA(2024) conducted study to Compare the Effect of Ischemic Compression versus Dynamic Stretching Exercises on Pain in Subjects with Upper Trapezitis. And concluded that Ischemic compression is more effective than dynamic stretching exercises in reducing pain associated with upper trapezitis.

SAM-HO PARK ACE, MYUNG-MO LEE(2020) conducted study on Effects of Lower Trapezius Strengthening Exercises on Pain, Dysfunction, Posture Alignment, Muscle Thickness and Contraction Rate in Patients with Neck Pain; Randomized Control trail and concluded lower trapezius strengthening exercise program is an effective method with clinical significance for reducing level of neck dysfunction, and improving postural alignment, muscle thickness, and contraction rate of lower trapezius muscle.

TEJASHWINI SHINDE AND NEERAJ KUMAR(2024) conducted study on Effects of lower deep neck extensors and trapezius strengthening on pain, disability and ROM in women with non-specific neck pain. and concluded that combining lower deep neck extensor with trapezius strengthening is found effective for pain, ROM and disability along with conventional treatment. The study found that General neck exercises is effective for pain, ROM and disability along with conventional treatment. The study also revealed that there is no statically significant difference in effects of lower deep neck extensor with trapezius strengthening vs GNE in women with nonspecific neck but is almost equally effective in reducing pain and ROM and disability.

A statistically significant difference between Group-A and Group-B, as well as within each group, was found by statistical analysis of quantitative data. In Group-A pre intervention mean to NPRS was 6.47(±0.52) and NDI scores are 15.87(±0.83). After treating subject with ULSSE the mean value of NPRS was 3.6(±0.51) and NDI scores are 7.73(±0.7), which show statistically significant difference within groups. In Group-B pre intervention mean to NPRS was 6.4(±0.51) and NDI scores are 15.93(±0.8). After treating subject with ERBE, the mean value of NPRS was 2.27(±0.46) and NDI scores are 5.47(±0.74), which show statistically significant difference within groups. The results of post-test statistical analysis for NPRS and NDI showed that there was significant statistical difference between group-A and B. The research is thus deemed to be statistically significant there by adopting alternative hypothesis since Group-B has large statistical difference than Group-A. Finally, the given elastic resistance band exercise resulted with decrease in pain and increase in speed of writing among students with trapezitis than upper limb and scapular stabilization exercise. Along with ERBE, ULSSE can also be trained to patients with trapezitis for greater effectiveness.

CONCLUSION

This study shows that both upper limb and scapular stabilization exercises and elastic resistance band exercises are effective in reducing pain and NDI score. However, elastic resistance band exercises training was better than upper limb and scapular stabilization exercises in reducing pain and improving speed of writing.

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REFERENCES

1. Nagrale AV, Glynn P, Joshi A, Ramteke G. The efficacy of an integrated neuromuscular inhibition technique on upper trapezius trigger points in subjects with non-specific neck pain: a randomized controlled trial. Journal of Manual & Manipulative Therapy. 2010 Mar 1;18(1):37-43..
2. Chaitow L. Muscle energy techniques. 2nd ed. Edinburgh: Churchill Livingstone, 2006, 1-187.
3. Sjörs A, Larsson B, Persson AL, Gerdle B. An increased response to experimental muscle pain is related to psychological status in women with chronic non-traumatic neck-shoulder pain. BMC Musculoskelet Disord 2011;12. doi: https://doi.org/10.1186/1471-2474-12-230.
4. Sjörs A, Larsson B, Persson AL, Gerdle B. An increased response to experimental muscle pain is related to psychological status in women with chronic non-traumatic neck-shoulder pain. BMC Musculoskelet Disord 2011;12. doi: https://doi.org/10.1186/1471-2474-12-230.
5. Fejer R, Kyvik KO, Hartvigsen J. The prevalence of neck pain in the world population: A systemic critical review of the literature. Eur Spine J 2006;15:834-48.
6. Paul Daniel VK, Abraham J. Effect of muscle energy technique versus middle and lower trapezius strengthening exercises on pain and neck functions in subjects with upper trapezitis. Int J Physical Educ Sports Health 2019;6:85-9.
7. Nyemb PM, Fontaine C, Ndoye JM. Review of the literature on anatomical variations of the trapezius muscle. MOJ Anat Physiol. 2017;4(5):385-90..
8. Johnson G, Bogduk N, Nowitzke A, House D 1994 Anatomy and actions of the trapezius muscle. Clinical Biomechanics 9: 44–50
9. Cibulka MT, Weissenborn D, Donham M, Rammacher H, Cuppy P, Ross AS. A new manual muscle test for assessing the entire trapezius muscle. Physiotherapy theory and practice. 2013 Apr 1;29(3):242-8.
10. Ludewig PM, Reynolds JF 2009 The association of scapular kinematics and glenohumeral joint pathologies. Journal of Orthopaedic and Sports Physical Therapy 39: 90–104
11. Bagg SD, Forrest WJ 1988 A biomechanical analysis of scapular rotation during arm abduction in the scapular plane. American Journal of Physical Medicine 67: 238–245
12. Phadke V, Camargo P, Ludewig P 2009 Scapular and rotator cuff muscle activity during arm elevation: A review of normal function and alterations with shoulder impingement. Revista Brasileira de Fisioterapia 13: 1–9

13. Smith M,Sparkes V, Busse M,Enright S 2009Upperandlower trapezius muscle activity in subjects with subacromial impingement symptoms: Is there imbalance and can taping change it? Physical Therapy in Sport 10: 45–50
14. Camargo PR, Neumann DA. Kinesiologic considerations for targeting activation of scapulothoracic muscles–part 2: trapezius. Brazilian journal of physical therapy. 2019 Nov 1;23(6):467-75.
15. Kinser AM, Sands WA, Stone MH. Reliability and validity of a pressure algometer: J Strength Cond Res. 2009 Jan; 23(1):312-4.
16. Lavelle ED, Lavelle W, Smith HS. Myofascial trigger points. Anesthesiology clinics. 2007 Dec 1;25(4):841-51.
17. Castori M, Morlino S, Celletti C, Ghibellini G, Bruschini M, Grammatico P, et al. Re-writing the natural history of pain and related symptoms in the joint hypermobility syndrome/Ehlers-Danlos syndrome, hypermobility type. Am J Med Genet A 2013;161A:2989-3004.
18. Docherty S, Harley R, McAuley JJ, Crowe LA, Pedret C, Kirwan PD, Siebert S, Millar NL. The effect of exercise on cytokines: implications for musculoskeletal health: a narrative review. BMC Sports Science, Medicine and Rehabilitation. 2022 Jan 6;14(1):5.
19. Liberman K, Forti LN, Beyer I, Bautmans I. The effects of exercise on muscle strength, body composition, physical functioning and the inflammatory profile of older adults: a systematic review. Current Opinion in Clinical Nutrition & Metabolic Care. 2017 Jan 1;20(1):30-53.
20. Yadav T, Gherwara KN. Effectiveness of upper limb and scapular stabilization exercises in college students suffering from recurrent trapezitis. MGM Journal of Medical Sciences. 2023 Apr 1;10(2):309-16.
21. Khare D, Pathak R. Effectiveness of elastic resistance band exercises versus conventional exercises on cases of trapezitis: A comparative study. Int J Orthop Sci. 2018;4(1):174-8.
22. Andersen CH, Zebis MK, Saervoll C, Sundstrup E, Jakobsen MD, Sjøgaard G, Andersen LL. Scapular muscle activity from selected strengthening exercises performed at low and high intensities. The Journal of Strength & Conditioning Research. 2012 Sep 1;26(9):2408-16.
23. Paine RM, Voight M. The role of the scapula. Journal of Orthopaedic & Sports Physical Therapy. 1993 Jul;18(1):386-91.
24. Başkurt Z, Başkurt F, Gelecek N, Özkan MH. The effectiveness of scapular stabilization exercise in the patients with subacromial impingement syndrome. Journal of back and musculoskeletal rehabilitation. 2011 Aug;24(3):173-9.