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## ORIGINAL ARTICLE

### EFFECTIVENESS OF POST ISOMETRIC RELAXATION TECHNIQUE OVER POST FACILITATION STRETCHING TECHNIQUE FOR PATIENT WITH TRAPEZITIS

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#### ABSTRACT

**Introduction:** Trapezitis is an inflammation caused in the Trapezius Muscle which further leads to pain and spasm in the neck. It increases commonly among people who are work at desk and computers, drivers, tailors, painters who uses their neck muscles a lot. MET is an active muscle based treatment approach that involves the voluntary contraction of a muscle in a controlled direction against the counterforce provided by the therapist. **Methodology:** This is a comparative experimental study conducted at physiotherapy OPD, ACS Medical College and Hospital. Study duration was 2 weeks with 4 session .Patient aged between 20-45 years. The sampling was chosen on purposive sampling. The pre and post test were Visual Analogue Scale (VAS), Neck Disability Index (NDI) and cervical lateral flexion ROM. In this study, 30 subjects are characterised into 2 groups of 15 subject each .Group A received post isometric relaxation technique and Group B received post facilitation stretching technique.Both pre and post test were measured using VAS,NDI and cervical lateral flexion ROM.Inclusion criteria are age of patient 20-45 years,pain,muscle spasm and tenderness.Exclusion criteria are patient age below 20 years,any cervical injury,recent surgery over cervical region. **Result:** On comparing pre and post test for both group on VAS,NDI and cervical lateral flexion ROM,post facilitation stretching technique show better result than post isometric relaxation technique in reducing pain,neck disability and improve neck ROM. **Conclusion:** The study concluded that post facilitation stretching technique was more effective than post isometric relaxation technique for patient with Trapezitis.

**Keywords:** Trapezitis; VAS; NDI; Post isometric relaxation technique; Post facilitation stretching technique

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## INTRODUCTION

Trapezititis is an inflammation caused in the trapezius muscle which further leads to pain and spasm in the neck. It is increasing and becoming common and also those who do physical labour or use their neck muscles and back muscles a lot and also bad posture. The prevalence of neck pain is about 50-60 % in every 6 months. In general population 20-70 % of adults are affected by neck pain in which it is seen that females are mostly affected<sup>1</sup>. The pathology behind the formation of trigger point is because of disturbed posture or poor ergonomics of neck which may lead to the shortening of muscle fibre, now the disturbed muscle receives less oxygen as well as low blood supply which will result in less removal of metabolic waste and it will provide a low level of nutrients to the muscle<sup>2,3,4</sup>.

Etiological factors are poorly understood and are usually multifactorial, including poor posture, anxiety and depression, neck strain, occupational causes, sedentary lifestyle is also a cause for neck pain, a person living a sedentary lifestyle is often sitting or lying down while engaged in an activity like reading, watching television, using mobile and computer<sup>11</sup>. The health care professionals are prone to injury due to their routine work<sup>5</sup>. The musculoskeletal disorder and other occupational health are frequent because of more manual work and unergonomic designing of tools and workplace<sup>6,7</sup>. In middle age, prevalence is highest and women are more affected than men. A trigger point is a sensitive spot in a taut band of a skeletal muscle that is painful on compression and stretch. As muscles are not designed for this continuous work, over a period the muscle gets overloaded and forms a knot<sup>8,9,10</sup>.

Muscles of the neck and shoulder region always function as a unit. Working posture with the neck flexion increases the load moment three to four times on the neck causing spasm of the neck muscles. Also, working task that involves arm movement always generates a static load component on these muscles; the principle muscle to carry this load is the Trapezius<sup>12</sup>. Low level activity of upper Trapezius is frequently found during sitting and standing which is related to head posture and is a common source of tension and neck pain in people who work at desks and computers or who spend many hours driving. The pain is present even during rest and is aggravated by activity<sup>13,14</sup>.

MET is an active muscle based treatment approach that involves the voluntary contraction of a muscle in a controlled direction against the counterforce provided by the therapist. There are two types of MET; Autogenic inhibition and Reciprocal inhibition. Autogenic inhibition and reciprocal inhibition both occur when certain muscles are inhibited from contracting due to the activation of Golgi tendon organ (GTO) and the muscle spindle. These two musculotendinous proprioceptors located in and around the joint and muscle respond to changes in muscle tension and length. The GTO located between the muscle belly and its tendon senses increased tension when muscle contracts or stretches. When the muscle contracts, GTO is activated and responds by inhibiting this contraction (reflex inhibition) and contracting the opposing muscle group. This process is known as Autogenic inhibition<sup>15</sup>.

In this study, Autogenic inhibition type is compared. In Autogenic inhibition, the compared two techniques are post isometric relaxation technique and post facilitation stretching technique. Post isometric relaxation

technique is the effect of the decrease in muscle tone in a single or group of muscle, after a brief period of submaximal isometric contraction of the same muscle<sup>16,17,19</sup>. Post facilitation stretching is a technique that involve a maximum contraction of muscle at midrange with rapid movement to maximum length followed by static stretch. In this study, Pain is measured by Visual Analogue scale (VAS), Neck disability is accessed by Neck Disability Index (NDI), Cervical ROM by goniometer.

## METHODOLOGY

The study design is an pre-post experimental study and of comparative study. The study was conducted in physiotherapy Outpatient Department in ACS medical college and hospital, velappanchavadi, chennai -77. The study duration was 2 weeks. About 30 subject who were selected based on inclusion criteria. Inclusion criteria are age of patient 20-45 years, pain, muscle spasm and tenderness. Exclusion criteria are patient age below 20 years, any cervical injury, recent surgery over cervical region. It was chosen on a simple purposive sampling. The outcome measures used were Visual Analogue Scale (VAS), Neck Disability Index (NDI) and cervical lateral flexion ROM.

**Procedure:** A total of 30 subjects were divided into two groups .i.e. Group A and Group B. Both groups received selected treatment over 2 weeks (4 days per week) with each technique having 3-5 repetition. Clear explanation and demonstration were given to the sample after taking informed consent. Group A received post isometric relaxation technique with duration between 10-15 min. The contraction is sustained for 7-10 sec and to breathe in during contraction and upon complete

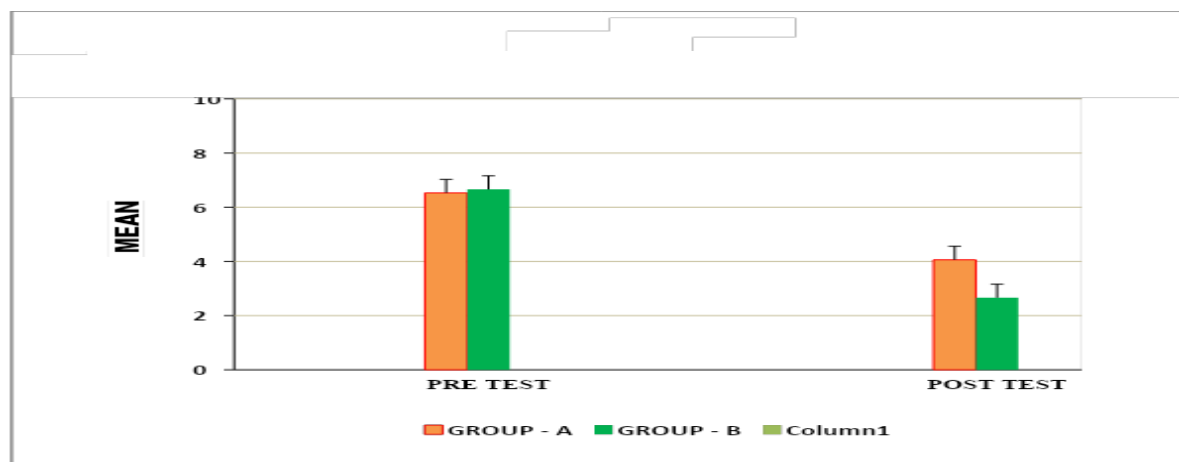
relaxation of effort 3-5 sec, then the therapist gently move the head and neck into increased degree of side bending and rotation followed by 30 sec static stretch. Once the muscle attain new position, then the same procedure is repeated for 3-5 times. **Group B** received post facilitation stretching technique with duration between 10-15 min. The head was initially positioned in a midposition between fully stretched and fully relaxed state. The contraction is sustained for 7-10 sec and to breathe in during contraction and upon complete relaxation of effort 3-5 sec, then the therapist gently move the head and neck into increased degree of side bending and rotation followed by 30 sec static stretch. Once the muscle attain new position, then the same procedure is repeated for 3-5 times. Both groups receive ultrasound therapy for 4 days for 1 week for relieving pain. Frequency 3 MHz, Intensity 1.0 W/Cm<sup>2</sup>, Duration of treatment is 10 minutes.

**Data Analysis:** The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) version 24, with a significance level of p value less than 0.05 and a 95% confidence interval set for all analysis. The Shapiro Wilk test was used to determine the normality of the data. In this study, Shapiro Wilk test showed that the data was normally distributed on the dependent values of VAS (significance 0.421), NDI (significance 0.337) & Cervical Lateral Flexion ROM (significance 0.518) at  $P > 0.05$ . Hence parametric test was adopted. Paired t-test was adopted to find the statistical difference within the groups & Independent t-test (Student t-Test) was adopted to find statistical difference between the groups.

#TEST	#GROUP – A		#GROUP - B		t – TEST	Df	Significance
	MEAN	S.D	MEAN	S.D			
PRE TEST	6.53	1.06	6.66	.975	-.358	28	.723*
POST TEST	4.06	1.09	2.66	.975	3.68	28	.000***

(\* -  $P > 0.05$ ), (\*\* -  $P \leq 0.001$ )

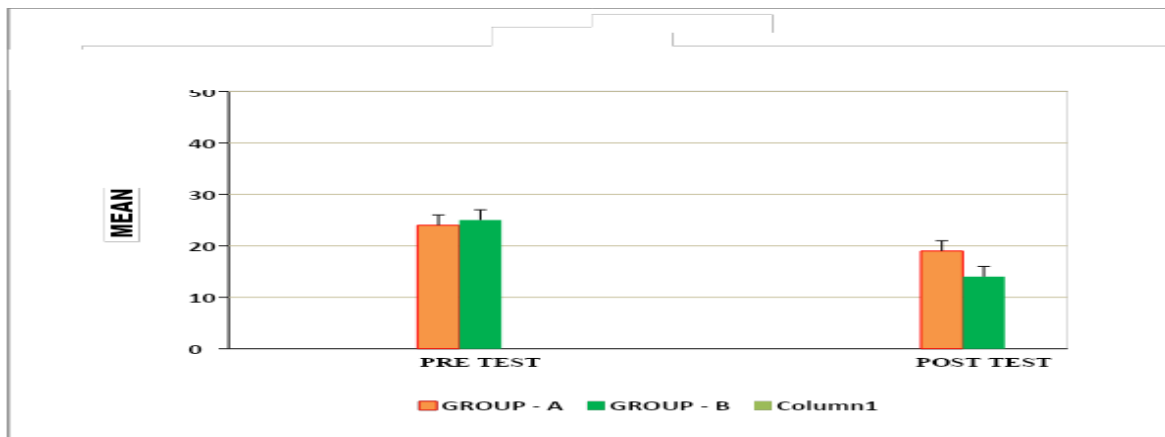
**Table 1-** Comparison Of Visual Analogue Scale Score between Group – A And Group - B In Pre And Post Test



**Graph 1-** Comparison of Visual Analogue Scale Score between Group A And Group B In Pre Test And Post Test

#TEST	#GROUP - A		#GROUP – B		t - TEST	df	SIGNIFICANCE
	MEAN	S.D	MEAN	S.D			
PRE TEST	24.53	5.61	25.26	5.04	-.376	28	.710*
POST TEST	19.33	5.02	14.66	3.55	2.93	28	.000***

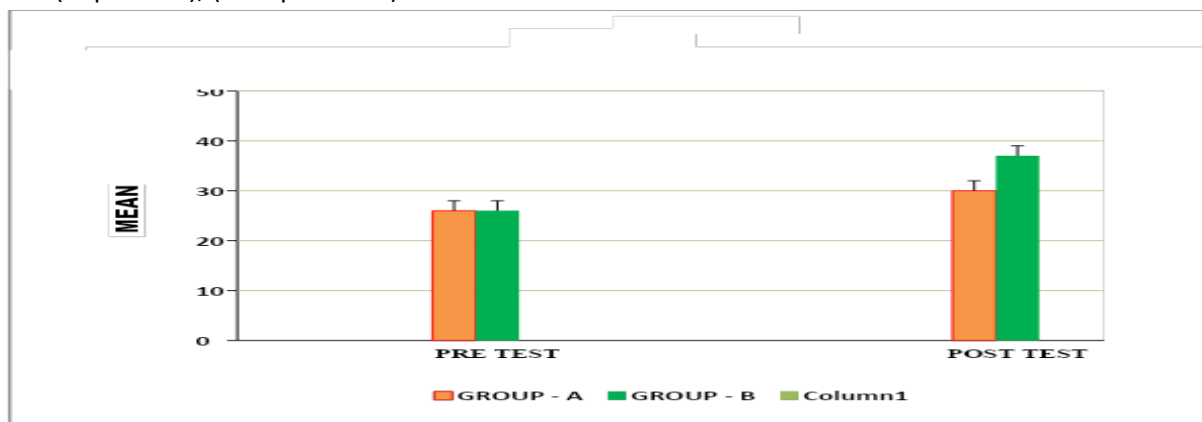
**Table 2-** Comparison Of Neck Disability Index Score Between Group – A And Group - B In Pre And Post Test . (\* -  $P > 0.05$ ), (\*\* -  $P \leq 0.001$ )



**Graph 2-** Comparison Of Neck Disability Index Score Between Group A And Group B In Pre And Post Test

#TEST	#GROUP - A		#GROUP - B		t – TEST	Df	Significance
	MEAN	S.D	MEAN	S.D			
PRE TEST	26.93	3.61	26.33	3.35	.471	28	.641*
POST TEST	30.20	3.36	37.26	3.08	-6.00	28	.000***

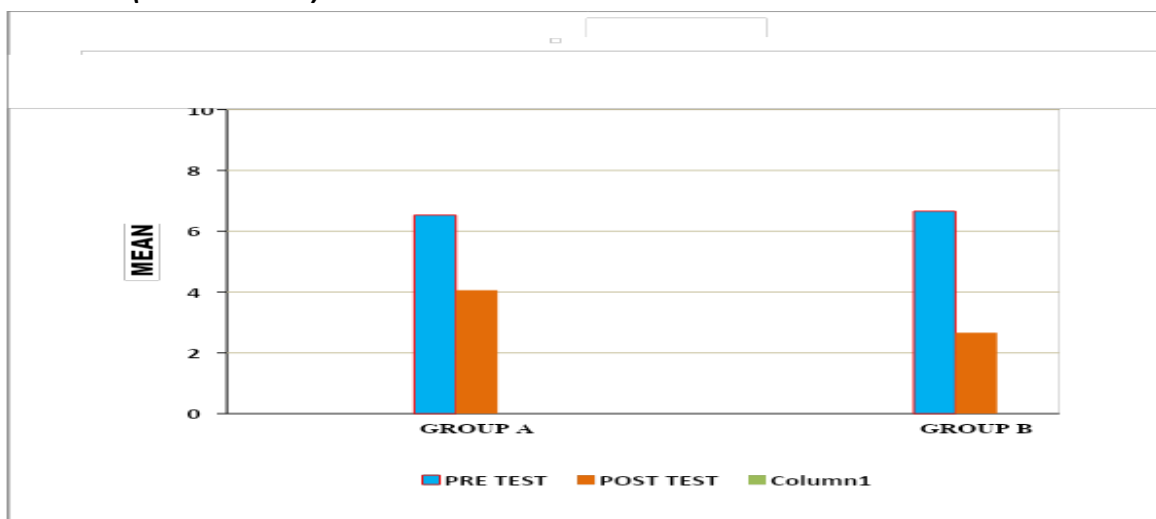
**Table 3 -** Comparison of cervical lateral flexion rom between group – a and group - b in pre and post test. (\*-  $p > 0.05$ ), (\*\*\*-  $p \leq 0.001$ )



**Graph 3 -** Comparison of Cervical Lateral Flexion Rom between Group A And Group B In Pre And Post

#GROUP	PRE TEST		POST TEST		t - TEST	Significance
	MEAN	S.D	MEAN	S.D		
<b>GROUP- A</b>	6.53	1.06	4.06	1.06	18.50	.000 <sup>***</sup>
<b>GROUP- B</b>	6.66	.975	2.66	.975	40.98	.000 <sup>***</sup>

**Table 4-** Comparison of Visual Analogue Scale Score within Group – A And Group - B Between Pre Test And Post Test (<sup>\*\*\*</sup>-  $P \leq 0.001$ )

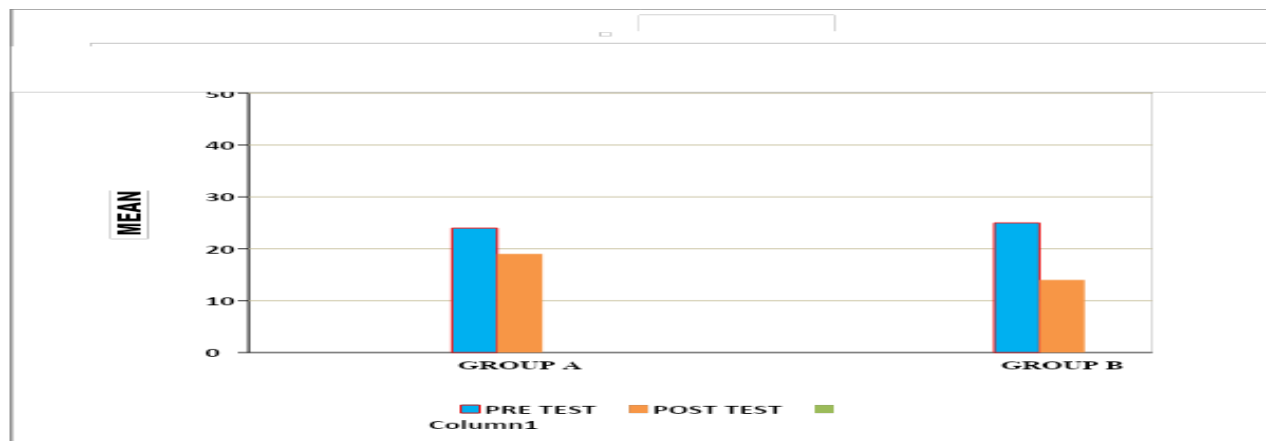


**Graph 4-** Comparison Of Visual Analogue Scale Score Within Group A And Group B Between Pre And Post Test.

#GROUP	PRE TEST		POST TEST		t - TEST	SIGNIFICANCE
	MEAN	S.D	MEAN	S.D		
<b>GROUP- A</b>	24.53	5.61	19.33	5.02	15.92	.000 <sup>***</sup>
<b>GROUP- B</b>	25.26	5.04	14.66	3.55	19.26	.000 <sup>***</sup>

(<sup>\*\*\*</sup>-  $P \leq 0.001$ )

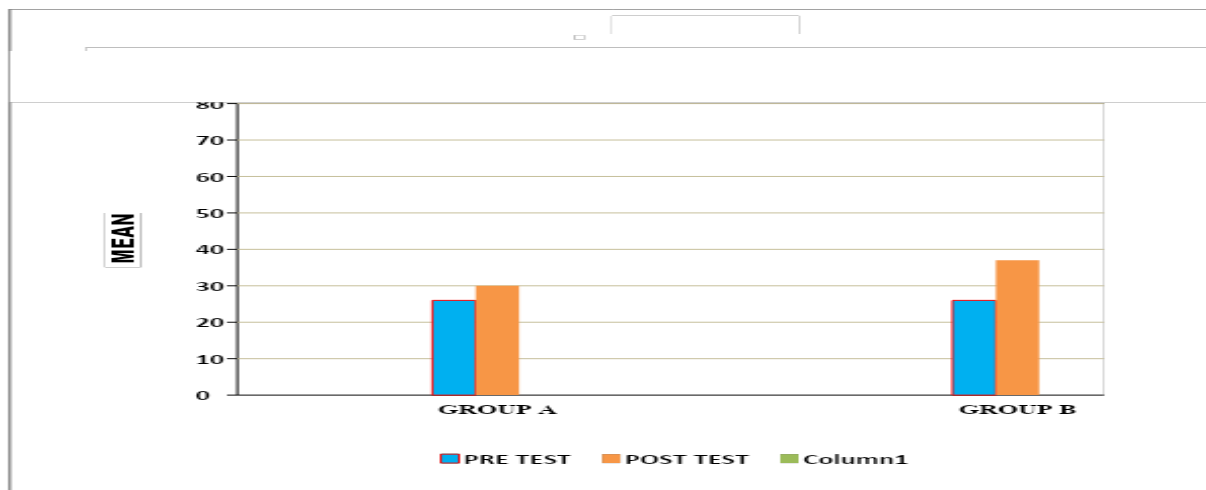
**Table 5-** Comparison of Neck Disability Index Score within Group – A & Group – B between Pre & Post Test Values



**Graph 5** - Comparison Of Neck Disability Index Score Within Group A And Group B Between Pre And Post Test Value

#GROUP	PRE TEST		POST TEST		t - TEST	SIGNIFICANCE
	MEAN	S.D	MEAN	S.D		
GROUP- A	26.93	3.61	30.20	3.36	-17.97	.000***
GROUP- B	26.33	3.35	37.26	3.08	-23.12	.000***

**Table 6**-Comparison of Cervical Lateral Flexion Rom Within Group – A & Group – B Between Pre & Post Test Values (\*\*\*-P< 0.001)



**Graph 6**- Comparison of Cervical Lateral Flexion Rom within Group A and Group B between Pre and Post Test Values

## RESULT

On comparing the mean value of Group A and Group B on Visual Analog Scale in terms of pain intensity. It show a significant difference in the post test mean value in both group ,but( Group B -post facilitation stretching technique) shows 2.66 which has the lower mean value is more effective than (Group A -post isometric relaxation technique) 4.06 at  $P < 0.001$ .

On comparing the mean values of Group A & Group B on NDI Score, it shows a significant decrease in the post test mean values in both groups, but (Group B - Post Facilitation Stretching Technique) shows 14.66 which has the lower mean value is more effective than (Group A - Post Isometric Relaxation Technique) 19.33 at  $P \leq 0.001$ .

On comparing the mean values of Group A & Group B on Cervical Lateral Flexion Range of Motion, it shows a significant increase in the post test mean values in both groups, but (Group B - Post Facilitation Stretching Technique) shows 37.26 degrees which has the higher mean value is more effective than (Group A - Post Isometric Relaxation Technique) 30.20 degrees at  $P \leq 0.001$ .

On comparing Pre test and Post test within Group A & Group B on VAS, NDI and Cervical Lateral Flexion Range of Motion shows highly significant difference in mean values at  $P \leq 0.001$

## DISCUSSION

A total of 30 Subjects from ACS Medical college OPD was selected on the inclusion criteria assessment sheet. Group A receive post isometric relaxation technique and Group B receive Post facilitation stretch technique. The

Visual Analogue Scale (VAS), Neck Disability Index (NDI), cervical lateral flexion ROM. The data analysis after 2 weeks of statistical analysis, to revealed significant difference in has brought to check the Effectiveness of post isometric relaxation technique and post facilitation stretching technique for patient with Trapezitis.

At table 1, on comparing the mean value of Group A and Group B on Visual Analogue Scale score.It show a significant decrease in post mean value in both group, but (Group B Post facilitation stretching technique ) shows 2.66 which has lower mean value is more effective than ( Group A Post isometric relaxation technique ) 4.06 at  $p < 0.001$ .G.Yatheendra Kumar,P.Sneha,et,al, 2015. Effectiveness of muscle energy technique, ischemic compression and strain counterstrain on upper trapezius trigger point.The study concluded that muscle energy technique is found to be effective than ischemic compression and strain counter strain technique.

At table 2 on comparing the mean value of Group A and Group B on NDI score.It show a significant decrease in the post test mean value in both group,but (Group B Post facilitation stretching technique ) show 14.66 which has lower mean value is more effective than ( Group A Post isometric relaxation technique ) 19.33 at  $p < 0.001$ . Apoorva Phadke, Nilima Bedekar, et al 2016. Effect of muscle energy technique and static stretching on pain and functional disability in patient with mechanical neck pain. The study concluded that muscle energy technique is more effective than stretching technique in improving pain and functional disability in people with mechanical neck pain. At table 3 on comparing the mean value of Group A and Group B on Cervical Lateral flexion ROM, It show a significant



increase in the post test mean value in both group ,but( Group B Post facilitation stretching technique ) show 37.26 degree which has the higher mean value is more effective than (Group A Post isometric relaxation technique ) 30.20 degree at  $p < 0.001$ . Aneri Jhaveri, Payal Gahlot, 2018, comparison of effectiveness of myofascial release technique vs muscle energy technique on chronic trapezitis. The study concluded that muscle energy technique is found to be more effective than myofascial release technique in reducing pain, improve cervical ROM.

At table 4,5,6 on comparing pre and post test with Group A and Group B on Visual Analogue Scale (VAS), Neck Disability Index (NDI), cervical lateral flexion ROM show highly significant difference in mean value at  $p < 0.001$ . Nipa Shah, Nshal Shah, 2015, comparison of muscle energy technique and ischemic compression on upper trapezius trigger point with non-specific neck pain. The study concluded that MET is more effective in improving CROM and relieve pain.

**Ethical clearance:** Ethical clearance was obtained from the ethical Institutional Review Board of Faculty of Physiotherapy, Dr. MGR. Educational and Research Institute, Chennai, with reference no: G-06/PHYSIO/IRB/2021-2022 approval letter dated 29/01/2022.

**Conflicts of Interest:** There is no conflict of interest to conduct this study.

**Fund for the study:** This is self-funded study.

## CONCLUSION

On statistical analysis, both MET technique include Post isometric relaxation and Post

facilitation stretching technique are effective for reducing pain, improve Neck ROM for patient with Trapezitis. On Comparing both MET technique, post facilitation stretching technique is effective than post isometric relaxation.

## REFERENCE

1. Desai R. Ray, Palekar T, et. al, Immediate effect of muscle energy techniques for upper trapezius muscle on neck pain. *Int sci Basic Appl. Res.* 2018; 8(7); 214-221.
2. Alghadir Ah, Iqbal .A, et. al, Efficacy of combination therapies on neck pain and muscle tenderness in male patient with upper trapezius active myofascial trigger point. *Biomed Res Int.* 2020;10:1-9.
3. Shah N, Comparison of two treatment technique muscle energy technique and ischemic compression on upper trapezius trigger point in subject with non – specific neck pain. *Int J Ther Rehabilitation* 2015;4(5); 260 -264.
4. Jhaveri .A, Gahlot .P. Comparison of effectiveness of myofascial release technique on chronic trapezitis . an experimental study. *Int J Innov Res Adv Study*, 2018 ;5(7):1
5. Muruganatham .B , Nayak .B, et, al Work related musculoskeletal disorder among Indian physiotherapist, 2015 ;101:E 1059-60.
6. Darivemula Sb, Goswami K, et, al Work related neck pain among desk job worker of tertiary care hospital in new delhi ,india ,burden and determinant .*Indian J Community med off Pubi Indian Assoc Prev Soc Med* 2016 ;41:50-4
7. Sain M.K, Meena.M .L, Occupation health and ergonomic intervention in indian small scale industries :a review *Int J Recent Adv MECHANICAL Engin* 2016;5(1):13-24.

8. Fejer. R,kyvik. K, et. al. The prevalence of neck pain in the world population , a systemic review of literature European spine journal, 2006;15 P 834 – 848.
9. Penas CF, Blanco CA, et al. The immediate effect of ischemic compression technique and transverse friction massage on tenderness of active and latent myofascial trigger point; a pilot study.Journal of body work and movement therapist, 2006; 10: p 3-9.
10. David G, Lois.S. Myofascial pain and dysfunction. The trigger point manual .Lippincott williams and wilkin :Atlanta ,GA;1999
11. Priyanka Devang Ranna. Effect of muscle energy technique vs positional release technique in computer workers with upper tarpezius muscle spasm.A comparative study.Internal Journal of Multidisciplinary Research and Development; 2017; 2349-5979.
12. Jagatheesan Alagesan, Unnati.S. Shah. Effectiveness of positional release therapy and taping on unilateral upper trapezius tender point, International Journal of Health and Pharmaceutical science ;2012;1(2): 13-17.
13. Amit V,Nagrle, et al. The efficacy of integrated neuromuscular inhibition technique on upper trapezius trigger point in subject with non-specific neck pain: A randomized controlled trial,Journal of manual and manipulative therapy ;2010;18(1):37-43(7).
14. El. Laithy MH and Fouda KZ. Effect of post isometric relaxation technique in the treatment of mechanical neck pain; Physiotherapy Rehabilitation; 2018; 5:20.
15. Haritha P, Shanthi. C and madhavi .K. Efficacy of post isometric relaxation vs static stretching in subject with non specific neck pain. International Journal of Physiotherapy; 2015;2;1097 -1102.
16. Lewit .K, Simon.Dg. Myofascial pain relief by post isometric relaxation .Archives of Physical medicine and Rehabilitation; Aug: 65 (8); 452-6; 1984.
17. A.Kumaresan, G.Deepthi, et. al Effectiveness of positional release therapy in the treatment of trapezitis .International of Journal of Phamaceutical science and health care ; 2012;1(2):71-81.

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