

## ORIGINAL ARTICLE

IJPHY

## EFFECT OF STRAIN COUNTER STRAIN TECHNIQUE AND STRETCHING IN TREATMENT OF PATIENTS WITH UPPER TRAPEZIUS TENDERNESS IN NECK PAIN

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## ABSTRACT

**Background:** Neck pain is a common disorder with a reported six-month prevalence rate of 54%. Strain/counter-strain technique and stretching are passive positional intervention aimed at relieving musculoskeletal pain and related dysfunction. The study aimed to find the effect of strain counter strain technique and to stretch on tenderness over upper trapezium of neck and neck function.

**Methods:** This is an experimental study with comparative pre-post study design. The subjects for the study selected from KPJ University College, Nilai, Malaysia. The study conducted in the Physiotherapy department of the University College. Total 70 with 53 female and 17 male patients were selected for this study as per sample size calculation. Thirty-five (35) samples were allocated to each group. Purposive sampling method adapted to select the samples. The study samples selected based on inclusion and exclusion criteria included exhibits with a tender point over upper trapezius. Dependant 't' test was used to find the outcome of the study.

**Results:** Paired t-test on the visual analogue scale (VAS) and Neck Disability Index (NDI) among stretching group found significant ( $P < .0001$ ) improvement in the outcome with a mean difference of 3.23 and 12.2 respectively. A paired t-test on VAS and NDI among strain counter strain group found significant ( $P < .0001$ ) improvement in the outcome with a mean difference of 3.829 and 22.686 respectively.

**Conclusion:** This study concluded that both stretching and strain counter strain technique could reduce pain in the upper trapezius of the neck and improve neck function among the patients.

**Keywords:** Stretching, strain counter strain, neck pain, visual analogue scale, Neck Disability Index.

Received 02<sup>nd</sup> March 2018, accepted 18<sup>th</sup> June 2018, published 09<sup>th</sup> August 2018



www.ijphy.org

10.15621/ijphy/2018/v5i4/175695

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## INTRODUCTION

Neck pain is very common among officers specifically on computer workers with a prevalence rate of more than 50% [1-3]. Strain/counter-strain technique is applied passively on muscles to reduce pain and increase joint functions in different regions of the body tender points [4].

Strain/counter strain is found effective to decrease hyper-sensitivity of muscular tissues on palpation thereby subjects can perform muscle strengthening programs to improve functions<sup>5</sup>. Many subjects with fibromyalgia have reported the effects of stretching and strain counter strain technique on pain and function of different joints [6].

Pathomechanism of neck pain in most of the cases are not identified in individuals, therefore, it is referred to as non-specific [7]. There are many factors contributing to non-specific neck pain, trigger point (TrP) is one of which has a scientific emphasis on that, stretching improve the flexibility of muscles thereby can increase the range of movement for the joints and can reduce neck pain [8-10].

Effect of myofascial release on pain was reported by Simons et al. in 1999. Break down the strategy of the pain-spasm-pain cycle can affect the treatment of muscle pain. McHugh et al. 1992, has reported the effect of passive sustained stretching to promote muscle relaxation and reduction of pain in tight muscles. The manual technique Strain counter-strain is useful in the reduction of pain and promoting muscle relaxation has been stated by Kisner C, 1990.

The concepts behind the treatment of sustained stretching and strain counter strain techniques are different, but both can promote muscle relaxation and reduce muscle pain by the break down the pain-spasm-pain cycle. The physiological effect of these techniques include an autogenic inhibition of tendon reflex and induce muscle relaxation. This improves the viscoelasticity of shortened muscles and surrounding tissues. The comparative effect of sustained stretching and strain counter strain technique is still controversial. The objective of this study is to find out the effect of strain counter strain over sustained stretching technique on neck pain and function.

## METHODOLOGY

This is an experimental study with subjects selected from all students and staff of KPJ University College, Nilai, Malaysia. Study setting as did in the Physiotherapy department of the University College. Purposive sampling method adapted to select the samples. Subjects selected based on inclusion and exclusion criteria.

**Inclusion criteria:** Both genders with age Group between 18 to 50yrs, subjects who exhibit a tender point over upper trapezius, Unilateral and Bilateral tender points were included for the study.

**Exclusion criteria:** Subjects with the traumatic and neurological condition, Subjects with an open wound, subjects which don't sign the informed consent were excluded from the study.

**Sample size and allocation:** Total 70 patients were selected for this study as per sample size calculation. Thirty-five (35) samples were allocated to each group.

## Study Materials/Measurement Tools:

Personal assessment form, Couch, Informed consent,

VAS (Visual Analogue Scale): This is a valid and reliable tool to evaluate pain intensity among subjects suffering from musculoskeletal ailments [11].

Neck disability index scoring interpretation: Raw Score Relative Impairment; 0-4 none, 5-14 mild, 15-24 moderate, 25-34 severe, > 35 complete.

## Intervention:

Both techniques were performed on alternate days for two weeks. Stretching done actively 3 times. Each time hold for 30 seconds followed by 10 seconds rest. Neck Disability Index, a reliable and valid tool used to collect the data from the samples [12,13].

## Stretching Procedure:

Stretching as performed in sitting position with feet comfortably placed on the ground. The neck is bend to forward and sideways slowly in a pain-free range of movement and rotate to opposite side, apply an inferior pressure on same side shoulder. Hold this stretching for 30 seconds and release gradually to return position then repeat it for three times.

**Data collection:** All subjects were physically examined by the physiotherapist to screen for the presence of palpable tender points over upper trapezius. The pre-intervention process took approximately 5 minutes.

Following the physical examination, the subjects were moved to a separate assessment cubicle where initial VAS score and neck disability index data was collected. The obtained data was documented as a pre and post-test score.

## Strain counter strain Procedure:

Strain counter-strain technique can perform in the upright sitting position. Locate tender points in upper trapezius muscle and apply pressure till get the sensation of pain after that perform neck ipsilateral side flexion with contralateral rotation, the shoulder in the same side need to be maintained abducted position.

**Statistical Analysis:** From the dependent variables, summary measures were evaluated and analyzed the differences. Descriptive data analysis of demographic data. Dependent 't' test used to find the effect of stretching and strain counter strain on the reduction of neck pain and neck function among the patients. The study was considered as significant with  $P < 0.05$ .

## RESULTS

**Descriptive data analysis:** Total 70 patients participated in the study with 53 females and 17 males and range of age 18 to 43 years (Table 1).

**Table 1:** Descriptive data analysis of Group A and Group

Group	Sex	Frequency	Age group
Strain Counter Strain Technique- Group A	F	32	19-40
	M	3	
Stretching Technique Group B	F	21	18-43
	M	14	
<b>Total</b>		<b>70</b>	

**Table 2: Paired t test within the Group A**

Group A	Paired Samples Test					t	df	Sig. (2-tailed)
	Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper				
PRE VAS STRETCH - POST VAS STRETCH	3.229	1.573	.266	2.69	3.769	12.14	34	.000
PRE NDI STRETCH - POST NDI STRETCH	12.200	7.654	1.294	9.57	14.83	9.43	34	.000

**Table 3: Paired t test within the Group B**

Group B	Paired Samples Test					t	df	Sig. (2-tailed)
	Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
			Lower	Upper				
PRE VAS SCS- POST VAS SCS	3.829	1.361	.230	3.36	4.296	16.64	34	.000
PRE NDI SCS -POST NDI SCS	22.686	6.825	1.154	20.34	25.03	19.67	34	.000

Table 2 and 3 show the outcome of stretching and strain counter strain technique on neck pain and function in Group A and Group B respectively.

## DISCUSSION

Total seventy (70), patients of both genders with nonspecific neck pain participated in the study. Fifty-three (53) patients were female and seventeen (17) males with age group of eighteen (18) to forty-three (43).

Paired t-test (Dependent) on the visual analogue scale (VAS) and Neck Disability Index (NDI) among stretching group found significant ( $P < .0001$ ) improvement in the outcome with a mean difference of 3.23 and 12.2 respectively. A paired t-test on VAS and NDI among strain counter strain group found significant ( $P < .0001$ ) improvement in the outcome with a mean difference of 3.829 and 22.686 respectively.

Mean difference in neck pain and function are 3.82 and 22.69 among patients undergone strain counter strain treatment, which is more effective than stretching exercise 3.23 and 12.2 respectively on neck pain and function.

Sirikarn Sompra Song et al. (2011) has reported the effect was not a significant difference on VAS in STR group, whereas, the SCS group indicated a significant difference of VAS with ( $P = 0.04$ ). The study also reported that there was a tendency of decrease of symptoms immediately after the treatment of SCS with ( $P = 0.06$ ) which remained until the next day.

Studies have reported strain counter strain has a good effect on tender points of upper trapezius muscles. This technique is very effective for immediate reduction of pain in muscular tender points. Modified application of strain

counter strain technique has proved a significant effect on pain ( $P < 0.001$ ), Albert Atienza (2006) [14].

Strain counter-strain technique can reduce pain thereby increase the function of the neck. Reduced pain in musculature can increase the range of movement of the neck. A reduction of pain and an increase in neck function of 50%-100% occurred in 19 of 20 patients immediately after SCS therapy. The partial improvement was maintained for six months in 11 of 20 patients, and four were still pain-free. This technique has been recommended for physical therapy for treatment of pain in tender points of musculature, Dardzinski J A (2000) [15].

This study has reported that there is an improvement in neck function, reduction of pain and tenderness over upper trapezius after the intervention with stretching and strain counter strain.

The outcome measure was analyzed between the group and found strain counter strain has more effect over stretching treatment technique.

Ethical Clearance of the Study: This study has got ethical clearance from the research and development committee of KPJ Healthcare University College, Nilai, Malaysia.

Conflict of interest: No conflict of interest on the outcome of this study.

## CONCLUSION

This study concluded that both stretching and strain counter strain technique could reduce pain in the upper trapezius of the neck and improve neck function. The neck is stretching, and strain counter strain technique can induce relaxation of upper neck muscles thereby increased neck muscle flexibility and function among the patients.

**Acknowledgment:** The investigators would like to express their gratitude to the management and research and development of KPJ Healthcare University College for their support and motivation to conduct this study. The researchers are thankful to all the participants to conduct this study successfully.

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#### **Citation**

Paul, J., & Balakrishnan, P. (2018). EFFECT OF STRAIN COUNTER STRAIN TECHNIQUE AND STRETCHING IN TREATMENT OF PATIENTS WITH UPPER TRAPEZIUS TENDERNESS IN NECK PAIN. *International Journal of Physiotherapy*, 5(4), 141-144.