Immediate Effect of Positional Release Technique on Pain, Neck Disability and Cervical Range of Motion in Upper Trapezitis Among Physiotherapy Students

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ABSTRACT

BACKGROUND: Upper trapezitis is common among physiotherapy students due to prolonged poor posture, repetitive strain, and extensive practical training. It leads to pain, restricted movement, and functional limitations, affecting academic and clinical performance. The postural release technique (PRT) is a manual therapy approach that helps reduce muscle tension, improve circulation, and restore postural balance, offering immediate relief from pain and stiffness.

OBJECTIVE: To evaluate the effect of positional release technique on pain, functional mobility and cervical range of motion among physiotherapy students with upper trapezitis.

METHOD: A total of 50 students with trapezitis meeting the inclusion and exclusion criteria were taken to receive single session of Positional Release Technique. Pre and Post intervention scores of NPRS, Cervical range of motion (CROM) and Neck disability index (NDI) were measured.

RESULTS: The study demonstrated statistically significant improvements following a single session of Positional Release Technique. The mean Numeric Pain Rating Scale (NPRS) score decreased from 7.72 ± 1.25 to 1.26 ± 1.05 (p < 0.001), and the Neck Disability Index (NDI) score improved from 19.36 ± 3.30 to 5.09 ± 2.46 (p < 0.001). Cervical Range of Motion (CROM) also significantly increased in all directions (p < 0.001), indicating enhanced functional mobility and reduced pain among physiotherapy students with upper trapezitis.

CONCLUSION: There is immediate positive effect in pain, neck disability and cervical range of motion among physiotherapy students.

Keywords: Trapezitis, physiotherapy students, positional release technique

INTRODUCTION

Trapezitis refers to the inflammation of the trapezius muscle. The upper trapezius is especially prone to overuse as a postural muscle.^[1] This study focuses on the upper trapezius muscle in college students, who are more susceptible to trapezitis. Neck discomfort, particularly in the upper fibers

of the trapezius, is commonly reported among this group. Compared to older individuals, young people experience a higher prevalence of pain. Trapezitis often triggers an early defensive muscular spasm during injury, leading to discomfort and muscle stiffness, as highlighted in several studies.^[2] The prevalence of neck

discomfort varies widely across studies, with a mean poof 13% and a mean lifetime prevalence of 50%.^[3] Due to the upper trapezius muscle's susceptibility to overuse, it often leads to pain behind the eyes, a limited range of motion, headache or tension headache in the temples, a stiff neck, and an intolerance to weight on your shoulder.^[4]

When working at a study table or desk, students often develop a forward head posture (FHP). FHP is recognized as an internal factor contributing to shoulder and neck pain dysfunction.^[5] Forward head posture (FHP) is a posture where the head is extended while the upper and lower cervical vertebrae are flexed. This shifts the gravitational centre (the head) forward, ^lincreasing the length of the external lever (the arm) and affecting the load-bearing axis. ^[6,7] The continuous load on the craniovertebral extension muscles and noncontractile structures can disrupt normal biomechanical movement. This added stress may lead to musculoskeletal damage or pain.^[8]

The pathogenesis of trapezitis can be explained by the reduced oxygen, glucose, and nutrient supply to stressed soft tissue areas. This leads to the accumulation of metabolic waste products, ultimately resulting in the formation of Trigger Points (TP).^[9]

Positional Release Technique is a manual therapy that helps restore a muscle to its normal resting tone. When a muscle is held in a shortened position for an extended period, it can lead to adaptive shortening and eventually cause spasm. This technique involves lengthening the muscle fibers, bringing the origin and insertion of the hypertonic muscle closer together. This positioning inhibits muscle spindle activation, reducing the efferent impulses sent to the brain, which would normally try to protect the tissue from overstretching. By interrupting this pathway, the muscle is allowed to relax and return to its normal resting tone. The process is completed by gently and passively returning the patient to a neutral position, without triggering the muscle spindle.^[10] and it gives the desired effect.

Thus, the objective of this study is to find the immediate effects of positional release technique on pain, cervical range of motion and neck disability index questionnaire in the participants with trapezitis among physiotherapy students.

MATERIALS & METHODS

The study was conducted among 50 physiotherapy students. This study used a pre-post quasi-experimental design. The data was collected from Jg college of physiotherapy college, Ahmedabad. The study ethical conduct was approved by the Institution. The inclusion criteria were as follows: participants aged 18-26 years, both male and female, with an NPRS score between 4 and 10 out of 10, experiencing unilateral or bilateral trapezius tender points, and pain lasting between 7 days and 1 month. The exclusion criteria included participants with recent cervical spine trauma or fractures, recent cervical spine surgery, neck deformities such as scoliosis or torticollis, or signs of radiculopathy or myopathy. And also, individuals with skin diseases around the treatment area, sensory disturbances near the affected region, brachial neuralgia (e.g., prolapsed intervertebral disc), and those currently taking anti-inflammatory medications. Then baseline data and pre intervention assessment was done.

The effectiveness of intervention was assessed using the outcome measure Numeric pain rating scale (NPRS), cervical range of motion by universal Goniometer and Neck Disability Index Questionnaire (NDI).

The students underwent Positional Release Technique (PRT), where the ideal comfort position was held for 90 seconds, followed by a 15-second rest, and then a passive return of the body part to its neutral anatomical position. This process was repeated three times. A single treatment session was administered, and immediate

effects were assessed using outcome measures, which were then compared to the baseline pre-treatment data.

OUTCOME MEASURES

- NPRS-The Numeric Pain Rating Scale (NPRS) is a simple, subjective tool used to assess the intensity of pain. It asks individuals to rate their pain on a scale from 0 to 10, with 0 representing no pain and 10 indicating the worst possible pain. It helps healthcare providers evaluate the severity of pain and track changes over time. NPRS has demonstrated high test-retest reliability (ranging from 0.85 to 0.95).^[11]
- 2) Cervical Range of Motion- All the motions were assessed by using Universal Goniometer. This test has satisfactory psychometric properties with ICC measurements for intra and inter examiner reliability that ranges from 0.80 to 0.93.^[12,13]
- Neck Disability Index-Function ability was assessed on the base of neck disability index questionnaire. It is a patient - completed condition specific functional status questionnaire with 10

items. It has sufficient support and usefulness to retain its current status as the most commonly used self – report measure for neck pain. Each section is scored on a 0 to 5 rating scale, in which zero means 'No pain and 5 means 'Worst imaginable pain'. All the points can be summed to a total score. The test can be interpreted as a raw score of 50, or a percentage.

STATISTICAL ANALYSIS

SPSS version 20 software was used for all data analysis. Wilcoxon signed-rank test was used.

The result demonstrated a significant difference in pain, range of motion, and functional mobility in physiotherapy students with upper trapezitis. (p<0.05)

RESULT

As the data was not normally distributed, Wilcoxon signed-rank test was used to evaluate the effect of PRT on pain, range of motion, and functional mobility in physiotherapy students with upper trapezitis.

SCALE	PRE	POST	p-value	Result				
	MEAN±SD	MEAN±SD						
NPRS	7.72±1.25	1.26 ± 1.05	< 0.001	Extremely Significant				
NDI	19.36±3.30	5.09 ± 2.46	< 0.001	Extremely Significant				
TABLE 1: Pre and Post results of NPRS and NDI								



GRAPH 1: This bar chart illustrates the mean scores before (PRE MEAN) and after (POST MEAN) the intervention for the Numeric Pain Rating Scale (NPRS) and the Neck Disability Index (NDI). The mean NPRS score decreased from approximately 7.5 to 1.5, while the mean NDI score reduced from around 19.5 to 5.3. These reductions suggest a statistically significant improvement in both pain intensity and functional disability following the intervention (p < 0.05).

CROM	PRE	POST	p-value	Result
	Mean ±SD	Mean ±SD		
Left Lateral Flexion	35.84±2.59	45.82±2.23	< 0.001	Extremely Significant
Right Lateral Flexion	36.92±2.59	47.94±1.63	< 0.001	Extremely Significant
Cervical Flexion	45.68±3.57	55.68±1.74	< 0.001	Extremely Significant
Cervical Extension	60.05±2.40	70.52±1.12	< 0.001	Extremely Significant
Left Cervical Rotation	71.06±2.62	81.06±1.62	< 0.001	Extremely Significant
Right Cervical Rotation	73.6±2.43	84.06±2.46	< 0.001	Extremely Significant

TABLE 2: Pre and Post results for Cervical ROM



GRAPH 2: This bar chart shows the comparison between pre-intervention and post-intervention mean values for cervical range of motion across six directions: left and right lateral flexion, cervical flexion and extension, and left and right cervical rotation. Post-intervention values show noticeable improvement in all directions of cervical movement, indicating enhanced mobility following the treatment. Statistical analysis revealed significant increases in ROM in all measured directions (p < 0.05).

DISCUSSION

The present aimed at finding out the immediate effect of positional release technique in reducing pain on NPRS scale, improving cervical range of motion and NDI score in students with trapezitis. The results of the present study showed that positional release technique is effective technique for reducing pain, disability improving cervical ranges.

This finding was consistent with previous research done by Pinakin Godse and Seema Sharma (2014) studied the effectiveness of Positional Release Technique (PRT) on pain and functional limitation caused by active myofascial trigger points in upper trapezitis. Using convenience sampling, 24 subjects (excluding those with wounds, sutures, or fractures) received PRT for six consecutive days. Paired t-test analysis showed significant improvement in pain and neck function. The results reveals that there was statically significant reduction in pain and improvement in neck function. As per result, the study concluded that positional release is effectual among the patient with upper trapezitis.^[14] Melzack and Wall (1998) proposed that pain reduction occurs mechanoreceptor when impulses from applied pressure interfere with pain signals (Gate Control Theory). Baldry (2013) added that endorphins and enkephalins released locally and in the brain contribute to pain relief. Jones (1982) highlighted that holding a position of ease for at least 90 seconds in PRT improves circulation by reducing sympathetic activity. Bailey and Dick (1992)supported the nociceptive hypothesis, positioning suggesting that damaged muscles in a relaxed state

enhances blood flow, reduces inflammation, and promotes tissue healing.^[15] Our findings are consistent with those of Meseguer et al., who demonstrated that Positional Release Technique (PRT) effectively reduces tenderness by increasing the pressure pain threshold (PPT) in trigger points of the trapezius in individuals upper with mechanical neck pain.^[16] This suggests that PRT may reduce tissue sensitivity by modulating nociceptor activity in soft tissues. An increase in PPT indicates decreased tenderness, highlighting the analgesic effect of PRT. Weiselfish (1993) also suggested that PRT engages fascial tension patterns related to trauma, inflammation, and adhesions, often resulting in a palpable release and normalization of fascial tension. The interventions given, work majorly on two mechanisms which is stimulation of mechanoreceptors and post pressure increase in blood circulation and relaxes the muscles and eventually helps in reducing pain, improving cervical range of motion and reducing functional disability. Given that the study involved physiotherapy students, the results might reflect better body awareness and response to manual therapy, which may not be the case in the general population. However, the findings strongly support the use of PRT as an effective and non-invasive method for immediate relief in cases of upper trapezitis.

LIMITATIONS

The sample size was small and limited to physiotherapy students, which may affect the generalizability of the findings. Only the immediate effects of the Positional Release Technique were assessed, without long-term follow-up. The lack of a control group and blinding may have introduced bias.

CONCLUSION

The study demonstrated that Positional Release Technique (PRT) has an immediate positive effect on reducing pain, improving neck function, and increasing cervical range of motion in physiotherapy students with upper trapezitis. These findings support the use of PRT as an effective, non-invasive, quick intervention for managing and myofascial trigger points and functional limitations in the upper trapezius muscle. Incorporating PRT into routine physiotherapy practice may offer immediate relief and improve overall patient outcomes in cases of upper trapezitis. However, further research with larger and more diverse populations is needed to confirm and generalize these results.

Declaration by Authors

Ethical Approval: Approved

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Conflict of Interest: The authors declare no conflict of interest.

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