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A COMPARATIVE STUDY OF MYOFASCIAL RELEASE TECHNIQUE AND POSITIONAL RELEASE TECHNIQUE ADJUVANT WITH PERCUSSIVE THERAPY IN TRAPEZITIS

[1]Harsh Karale, [2] Dr. Umiya Pathan, [3]Dr. Amruta Doijad, [4]Tejal Khade, [5]Pradnya Koli

[1]B. P. Th, D. Y. Patil College of Physiotherapy, D. Y. Patil Education Society (Deemed To Be University), Kolhapur.
[2]Professor and HOD, (Musculoskeletal Physiotherapy), D. Y. Patil College of Physiotherapy, D. Y. Patil Education Society (Deemed To Be University), Kolhapur.
[3]Professor and HOD (Neuro)sciences physiotherapy, D. Y. Patil Medical College, D. Y. Patil Education Society (Deemed To Be University), Kolhapur.
[4] B. P. Th, D. Y. Patil College of Physiotherapy, D. Y. Patil Education Society (Deemed To Be University), Kolhapur.
[5] B. P. Th, D. Y. Patil College of Physiotherapy, D. Y. Patil Education Society (Deemed To Be University), Kolhapur.

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ABSTRACT

Background

Trapezitis refers to inflammation of neck and upper back specifically the trapezius muscle. Desk job workers especially the ones who have prolong period of computer related work are prone to trapezitis. Various therapeutic interventions including Myofascial Release Technique, Positional Release Technique and Percussive therapy are used in treatment of trapezitis. This study aims to compare the effects of Myofascial Release Technique and Positional Release Technique, both when paired with percussive therapy with the help of Numeric Pain rating scale (NPRS) and Pain Threshold Algometer.

Method

In this interventional study, 64 desk job workers were divided in two groups Group A (n=32) and Group B (n=32) respectively. Group A was treated with Myofascial release technique adjuvant with percussive therapy and Group B was treated with Positional release technique adjuvant with percussive therapy and pre and post assessment was done using Numeric pain rating scale (NPRS) and Pain threshold Algometer.

Result

Effect of GROUP A was assessed by using Paired t Test /Wilcoxon's Signed Rank Test. Effect of GROUP B was assessed by using Paired t Test / Wilcoxon's Signed Rank Test. Comparison Between both GROUP was done by using unpaired t Test / Mann-Whitney Test. Results indicated statistically difference within both the groups in Numeric pain rating scale where Group A resulted as a better treatment option.

Conclusion

The study conducted among desk job workers under 8 hours of work reveals that the Group treated with Myofascial Release Technique along with percussive therapy i.e. Group A has slightly better outcome than that of the Group B, treated with Positional Release Technique

adjuvant with percussive therapy, furthermore immediate effect was seen in participants of Group A.

Keywords: Trapezitis, myofascial release technique, positional release technique, percussion therapy.

INTRODUCTION

Trapezius is made up of incredibly lengthy muscular fibers that extend widely across the upper back. with terms of function, this enables the trapezius to support and aid with postural characteristics, primarily enabling the spinal column to stay upright when the individual is standing. One of the broadest and closest to the skin muscles in the upper back and trunk is the trapezius. Due of its initial encounter, it is frequently utilized as a landmark during corpse dissection. The trapezius is a large, narrow, triangular muscle that covers the neck and upper back of the shoulders. The ligamentum nuchae, scapulae, clavicles, ribs, and the spinous process of C7–T12 of the spine are its attachment sites [(1)].

The trapezius muscle consists of three halves. The superior part is attached to the neck (ligamentum nuchae) and skull (external occipital protuberance and superior nuchal line). The head is extended at the neck by this part of the muscle. The central section connects to the upper region of C7-T12's spinous processes. The two scapulae are adducted (drawn together) by this section. The scapula is depressed by the inferior section, which is the lower half of C7-T12. The lateral third of the clavicle, the acromion process, and the scapular spine are where muscles are inserted. The muscles that connect the arm to the body wall are called axio-appendicular muscles. The muscles that join the body wall to the scapula are actually important because they stabilize the scapula, which allows the scapulohumeral muscles that attach the scapula to the arm to work properly [(1)].Although the primary function of the trapezius muscle is postural, it also facilitates active movements such side bending, head rotation, shoulder elevation and depression, and internal arm rotation. The scapula is raised, lowered, and retracted by the trapezius. The arms are internally rotated by the trapezius muscle's descending muscle fibers. The scapulae are medially rotated by the ascending muscle fibers and retracted by the transverse muscle fibers[(1)]. Known as a postural muscle, the upper trapezius is particularly vulnerable to overuse. Activity exacerbates the discomfort, which is felt even when at rest and may radiate to various areas from the initial site of inflammation. Pain and protective spasm in antagonist muscle groups can cause pain and limit passive range of motion. The trapezius muscle, which is located at the back of the neck, aids in both the upward movement of the head and the shoulder shrugging motion [(6)].People who work at desks and computers or who drive for extended periods of time often have tension and neck stiffness due to low level activation of the upper trapezius during sitting and standing, which is related to head position. Poor ergonomics frequently result in a shortened upper trapezius, which causes the muscle to become short and result trapezitis [(3)].

The area of the upper trapezius muscle is frequently the site of neck pain. Neck pain affects over two-thirds of people at some point in their lives. Women are more impacted than men, and the prevalence is highest in middle age. The prevalence of neck discomfort varies greatly between studies, with a mean lifetime prevalence of 50% (range 14.2% – 71.0%) and a mean point prevalence of 13% (range 5.9% – 38.7%) [(3)].

Several therapeutic techniques, including PRT, manual treatments, physical therapy modalities, dry needling, and MTrP injections, have been proposed thus far to address myofascial trigger points (MTrP) in both surgical and nonsurgical approaches. However, manual pressure release has been shown to be useful in the short term for reducing pain and increasing cervical range of motion. The manual therapy methods are renowned for being rapid, safe, and side-effect-free [10].Developed by Albeit Fulford in 1931, percussion therapy (PT) is a myofascial release treatment that uses vibration to increase range of motion and relax tense muscles. Percussive therapy is widely used in sports to improve muscle strength and performance, lower the risk of injury during warm-ups, and speed up muscle recovery by reducing discomfort, promoting lymphatic flow, minimizing scar tissue, and reducing muscular spasms. It has been discovered that percussion therapy enhances passive range of motion and athletic performance. For example, a percussion massage applied to the dorsiflexor muscles can enhance both muscle performance and range of motion [7].Treatment with a portable percussion massager has grown in popularity in recent years. There are two options: self-massage and massage by a therapist using the Theragun™. The frequency of the Theragun™ can be adjusted up to and including 53 Hz. The devices can hold a variety of attachment heads. One immediate advantage of Theragun™ is that it improves range of motion and lessens muscular soreness [5].Manual therapy is one of the most crucial types of trigger point treatment. Myofascial release (MFR) is one method used in manual therapy to treat trapezius trigger points. It relaxes tense muscles and enhances vascular and lymphatic evacuation. It works by altering connective tissue's viscoelastic characteristics. Muscle alignment is corrected. MFR in the form of direct physical contact involves deep transverse friction massage from the ulnar border of the palm and stretching the muscle from its origin to its insertion [4].

Through MFR, the ground substance's viscosity is changed to a more fluid state, removing the fascia's excessive pressure on the structure that is sensitive to pain and restoring normal alignment. This method reduces trapezius spasm by acting as a catalyst [3].

Positional release therapy (PRT) is another type of manual therapy used to treat trigger points. This method is supposed to provide long-term relief from musculoskeletal problems, trigger point pain, and pain by using passive body alignment. PRT relies on carefully positioning injured tissue to release or lessen an unmanageably high level of tension and/or spasm. The processes thought to be involved are spindle resetting, reduced nociceptive sensitivity, and circulating advancement [4].

Positional release restores a muscle to its typical resting tone. Long-term holding of the muscle in a shortened position results in adaptive shortening, which in turn promotes spasm. This approach lengthens the fibers that roughly correspond to the hypertonic muscle's origin and insertion. This position reduces the quantity of efferent impulses to the brain by inhibiting muscle spindle activity. In order to prevent the tissue from being overly organized, efferent impulses were working. The patient's muscle is given the opportunity to relax and return to its typical resting tone by blocking this channel. The desired result is achieved by gradually and passively putting the patient back into an automatically neutral position without causing the muscle spindle to fire [2].

In addition to focused and gross myofascial release, a technique called "combination release" can be employed. The first stretch

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produced by gross myofascial release can be followed by focused myofascial release on the individual's particular muscle type. It is feasible to identify and correct refined malalignments that are the source of patient issues by concentrating on tiny restrictions within the myofascial unit [5].

METHODOLOGY

Type of Study– Experimental study.

Study design- Randomised clinical trial.

Sampling design- Non probability sampling

Study Duration- 6 months

Study place- Kolhapur city

Target population- Desk job workers

Type of sampling- Convenience sampling
Sample size- 64

MATERIALS

Data collection sheet

Consent form

Pain Threshold Algometer for pain

Percussive therapy device or Theragun

Numeric Pain Rating Scale (NPRS) score form for pain

CRITERIA FOR SELECTION

INCLUSION CRITERIA

1. Age 25 - 45 years.
2. Participants of all gender.
3. Desk job workers with daily work under 8 hours.
4. Participants with upper trapezius pain.

EXCLUSION CRITERIA

1. Fracture, trauma or participants who underwent recent surgeries near neck and shoulder region.
2. Neurological conditions like fibromyalgia.

RESULT

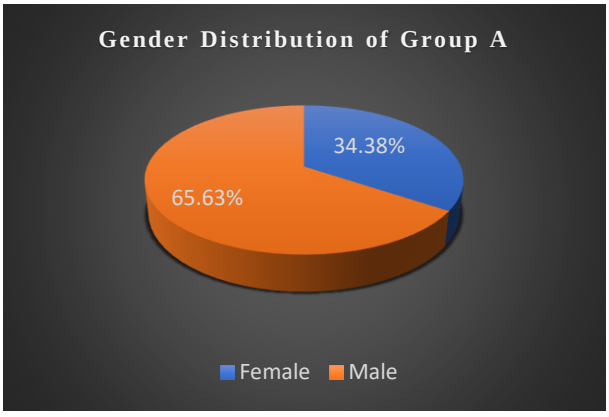
The comparative study of Myofascial Release Technique and Positional release technique adjuvant with percussive therapy in trapezitis revealed that Myofascial Release Technique adjuvant with percussive therapy was a better treatment option to treat trapezitis than Positional release technique adjuvant with percussive therapy. However, both the interventions helped in treating the said condition the NPRS score was better in the Group A i.e. participants treated with Myofascial Release Technique adjuvant with percussive therapy, and had an immediate effect.

A. GENDER DISTRIBUTION

Table 2 presents the distribution of the total participants. Among 32 participants in Group A, 21 were male and 11 were female. Graph 1 illustrates the percentage distribution, showing that males are accounted for 65.63% of the total, while females comprised 34.38%.

Gender	No of Patients	Percentage
Female	11	34.38%
Male	21	65.63%
Total	32	100.00%

Table 2: Shows distribution of gender in Group A.



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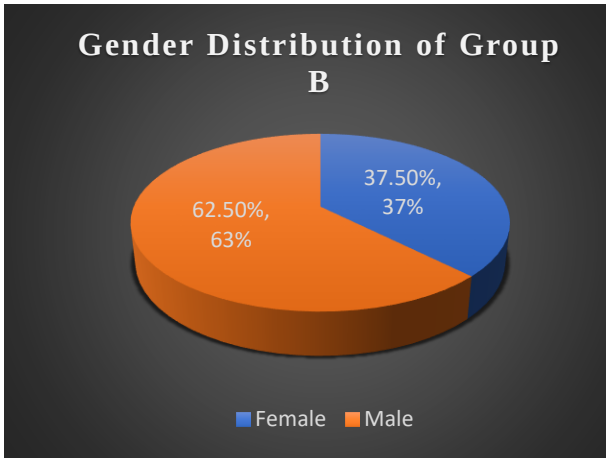
Graph 1: Shows distribution of gender in Group A.

Table 3 presents the distribution of the total participants. Among 32 participants in Group B, 20 were male and 12 were female.

Graph 2 illustrates the percentage distribution, showing that males are accounted for 62.50% of the total, while females comprised 37.50%.

Table 3: Shows distribution of gender in Group B.



Graph 2: Shows distribution of gender in Group B.

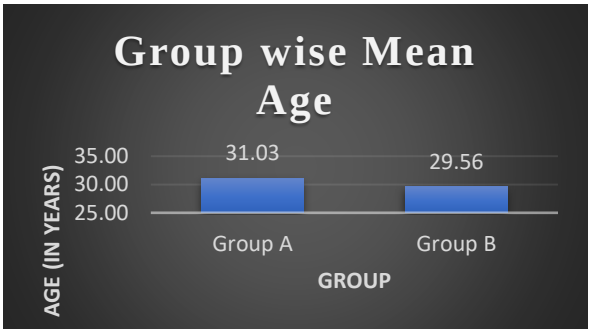
B. AGE WISE DISTRIBUTION

Table 4 presents the age wise distribution of participants in Group A and Group B. The mean age for Group A was 31.03 years (S.D. 4.88), while Group B had mean age of 29.56 years (S.D. 3.40).

Graph 3 illustrates graphical representation of the mean ages, showing a similar distribution across both the groups indicating that age is evenly distributed among participants within the two exercise groups, as illustrated in the graphical comparison.

Age	Mean	S.D.	P-Value
Group A	31.03	4.88	0.0835
Group B	29.56	3.40	

Table 4: Age distribution



Graph 3: Age wise Distribution

C. PRE & POST NUMERIC PAIN RATING SCALE OF GROUP A

Table 5 presents pre and post intervention values of NPRS for Group A (Myofascial release technique along with percussive therapy). The results show significant improvement, with NPRS decreasing from mean of 5.38 to 0.97 (P- value 6.78E-19), using Mann- Whiteney U-Test.

Gender	No of Patients	Percentage
Female	12	37.50%
Male	20	62.50%
Total	32	100.00%

Variable	Time Point	Mean	S.D.	P-value
Numeric Pain Rating Scale	Pre	5.38	1.81	6.78E-19*
	Post	0.97	0.90	

Table 5: Pre-Post Intervention of NPRS in Group A

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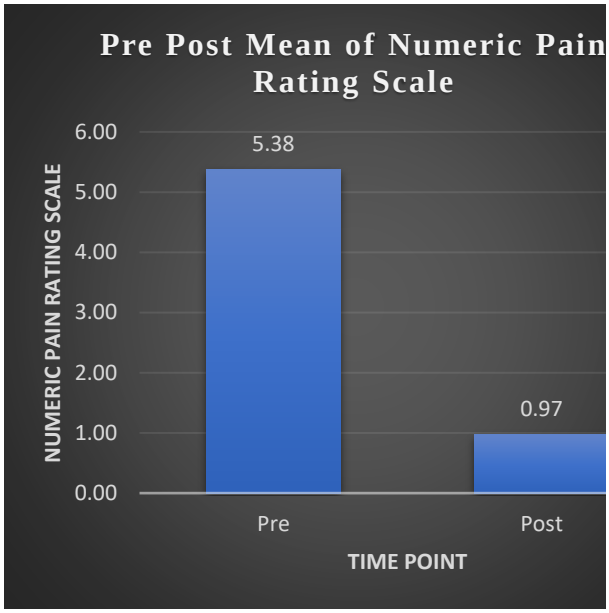
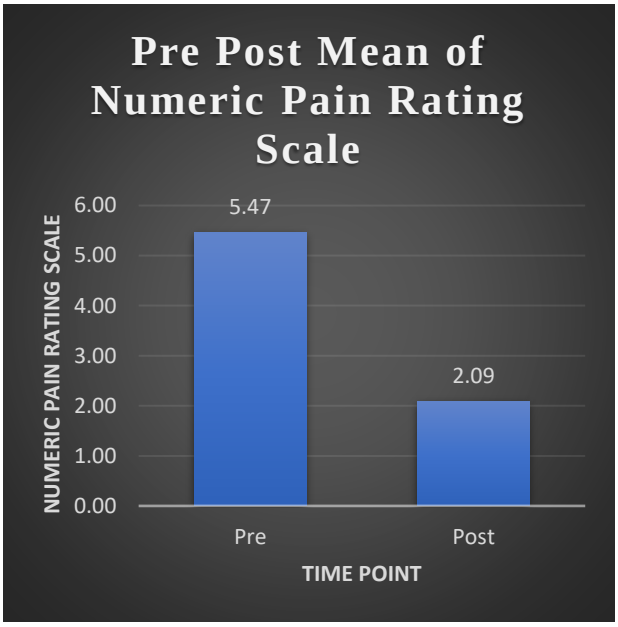


Graph 4: Pre and post mean of numeric pain rating scale in Group A.



Graph 5: Pre and post mean of numeric pain rating scale in Group B.

D. PRE & POST NUMERIC PAIN RATING SCALE OF GROUP B

Table 6 shows pre and post intervention values of NPRS for Group B (Positional release technique along with percussive therapy). Although the results show improvements in the pre and post values with mean decreasing from 5.47 to 2.09 (P-value 2.16E-16) using Mann- Whiteney U-Test, but Group A has a better outcome.

Variable	Time Point	Mean	S.D.	P-value
Numeric Pain Rating Scale	Pre	5.47	1.87	2.16E-16*
	Post	2.09	1.55	

Table 6: Pre-Post Intervention of NPRS in Group B.

E. PRE & POST PAIN THRESHOLD ALGOMETER VALUES IN GROUP A.

Table 7 shows pre and post intervention values of pain threshold algometer in Group A. The results show significant improvement, with algometer mean values increasing from 2.25 to 4.75 (P- value 2.22E-19), using Mann- Whiteney U-Test.

Variable	Time Point	Mean	S.D.	P-value
Pain Threshold Algometer	Pre	2.25	0.84	2.22E-19*
	Post	4.75	0.84	

Table 7: Pre and Post Pain threshold algometer values in Group A.

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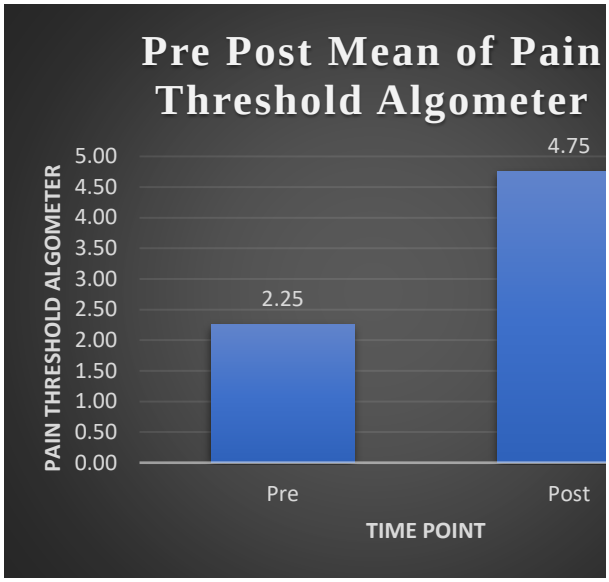
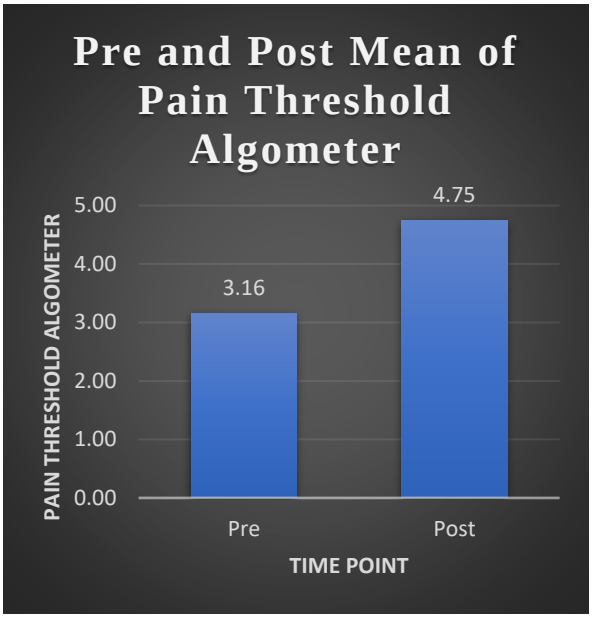


Graph 6: Pre and post pain threshold algometer mean values in Group A.



Graph 7: Pre and post pain threshold algometer mean values in Group B.

F. PRE & POST PAIN THRESHOLD ALGOMETER VALUES IN GROUP B.

Table 8 represents the pre and post intervention values of pain threshold algometer in Group B. The results show improvement, with algometer mean values increasing from 3.16 to 4.75 (P- value 2.32E-10), using Mann- Whiteney U-Test, there is no significant difference between the algometer values of both the groups.

Variable	Time Point	Mean	S.D.	P-value
Pain Threshold Algometer	Pre	3.16	1.19	2.32E-10*
	Post	4.75	0.76	

Table 8: Pre and Post Pain threshold algometer values in Group B.

DISCUSSION

This study aims to compare the efficacy of Myofascial Release Technique and Positional Release Technique adjuvant with Percussive therapy in trapezitis.

A total of 64 subjects were recruited in the study desk job workers of age group 25-45 years with under 8 hours of daily work and minimum 1 year of work experience were divided into two group with 32 in each group.

Group A received Myofascial Release Technique adjuvant with Percussive therapy for one week in total of three sessions and Group B received Positional Release Technique adjuvant with Percussive therapy for one week in total of three sessions.

In the recent study, Numeric pain rating scale (NPRS) and Pressure Threshold Algometer were used to assess the prognosis of the treatment by taking the pre and post values of both the outcome measures respectively, as the above-

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mentioned outcome measures have good reliability and validity [12,13].

A previous study by Yadav and Sharma (2024) examined the efficacy of Positional Release Therapy (PRT) and Myofascial Release Therapy (MRT) in treating upper trapezius trigger points. The study's conclusions have significant ramifications for manual therapy approaches since myofascial trigger points in the upper trapezius are common and frequently cause neck pain and limited movement. The goal of the study is to compare MRT with PRT in order to ascertain whether method offers better pain management and functional enhancement. The study may help clinicians choose the best treatment plans for individuals with myofascial pain syndrome if it shows that either strategy has substantial advantages. The study found that both interventions were effective in reducing pain and increasing pain pressure thresholds. Notably, the group receiving MRT combined with static stretching showed more significant improvements compared to the PRT group [4].

Another study by Sai Vispute and Neeraj Kumar showed that college students with trapezitis can benefit from both Myofascial Release Technique (MFR) and Positional Release Technique (PRT) in terms of pain relief, cervical range of motion, and functional ability. Cervical range of motion (CROM), Visual Analogue Scale (VAS) ratings, and the Neck Disability Index (NDI) all showed immediate post-treatment improvements, indicating that both methods may be useful in treating myofascial pain brought on by bad posture and overuse of muscles. There was no statistically significant difference between the two therapies, despite the fact that both demonstrated notable within-group improvements, suggesting that both methods can be applied successfully in clinical settings [2].

In a previous literature by Pathan et al. (2021), gives important information about how Positional Release Therapy (PRT) and Manual Trigger Point Release (MTpR) affect computer users' upper trapezitis right away. Both treatments showed promise as successful therapy for myofascial pain syndrome in those who use computers regularly by considerably reducing neck discomfort and improving cervical range of motion (CROM). According to the findings, both PRT and MTpR improve functional mobility and lessen discomfort by addressing the underlying muscular dysfunction and stiffness that cause upper trapezius pain. The unique nature of MTpR, which applies manual pressure to the afflicted muscle fibers to directly target and deactivate trigger points, may be the reason why the MTpR group improved more than the PRT group. This allows for more rapid alleviation [10].

Additionally, a study by Basumatary N et al. (2024) highlighted the efficacy of gross-myofascial release (MFR) and percussion therapy in enhancing quality of life, range of motion (ROM), and discomfort in patients with frozen shoulder. The gross-MFR group showed a considerable improvement, indicating that this approach successfully tackles muscle tightness and fascial limitations, resulting in increased mobility and pain reduction. Gross-MFR's greater results over percussion therapy are probably due to its ability to improve circulation, decrease adhesions, and restore tissue extensibility. Percussive therapy also demonstrated significant improvements, but its effects might be more concentrated on temporary muscle relaxation than on long-term tissue remodeling [5].

In another study by Malani and Pathan (2025) offers insightful information about the relative efficacy of percussion massage treatment and instrument-assisted soft tissue mobilization (IASTM) in treating

unilateral trapezitis in college students. Significant gains in range of motion, muscular relaxation, and pain reduction were shown with both therapies. IASTM probably promotes collagen remodeling, improves tissue healing, and removes myofascial constraints by applying controlled microtrauma using specialized instruments. Conversely, percussive massage therapy increases circulation, decreases muscle stiffness, and encourages neuromuscular relaxation by rapidly oscillating the muscle. Although both approaches produced favorable results, the study might have discovered differences in the degree and duration of pain alleviation, indicating that each approach offers distinct physiological advantages [14].

For young adults with non-specific neck discomfort, the study by Chockalingam, Kumar, and Inamdar (2023) offers important insights into the relative efficacy of traditional physical exercise versus percussion massage therapy using the Theragun device. The results indicate that both therapies were helpful in controlling musculoskeletal discomfort, as seen by the significant improvements in neck range of motion (ROM) and pain levels. The deep muscle stimulation and improved blood circulation that the Theragun provides are probably the reasons why individuals in the percussion therapy group had a more significant and instantaneous decrease in pain intensity. Percussive therapy's quick oscillatory motions might have also helped with neuromuscular relaxation, which would have improved tissue mobility and decreased muscle stiffness. However, because it relies on active movement and postural adaptation rather than direct muscle relaxation, the benefits of physical activity may have been more gradual, even though it still produced improvements. These findings are consistent with previous studies supporting the use of percussion massagers as a supplement to conventional rehabilitation techniques for the treatment of musculoskeletal pain [15].

In the treatment of Myofascial Pain Dysfunction Syndrome (MPDS), the study by Patel and Vedawala (2023) emphasizes the possible advantages of combining Myofascial Release (MFR) therapy with a fascial pistol, a percussion therapy tool. The findings demonstrated that there were notable improvements in functional ability and pain reductions in both treatment groups—those receiving MFR alone and those receiving MFR in conjunction with fascial gun therapy. The group that received the combined treatment, however, demonstrated more benefits, indicating that the fascial gun's mechanical stimulation might amplify the effects of conventional MFR. This improvement is probably the result of deeper muscle relaxation, better circulation, and enhanced tissue mobility made possible by the fascial gun's quick oscillatory oscillations [16].

In this study the improvement in NPRS score was more in participants of Group A (Myofascial release technique adjuvant with percussive therapy) as compared to that of participants in Group B (Positional release technique adjuvant with percussive therapy) whereas the improvements in Pain Threshold Algometer were moreover similar in both the groups. The equal effectiveness of both techniques in this regard indicates that each intervention provides meaningful benefits in treating trapezitis in desk job workers.

CONCLUSION

The study conducted among desk job workers under 8 hours of work reveals that the Group treated with Myofascial Release Technique along with percussive therapy i.e. Group A has slightly better outcome than that of the Group B, treated with Positional Release Technique adjuvant with

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percussive therapy, furthermore immediate effect was seen in participants of Group A.

CONFLICTS OF INTEREST

The author declares that there are no conflicts of interest concerning the content of the present study.

ETHICAL APPROVAL

The institutional ethics committee of D.Y. Patil college of physiotherapy has given the permission to initiate the project work

Protocol number :

Keywords
Proprioception, Upper back pain, Graduates.

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