



TO STUDY THE COMPARISON BETWEEN ACTIVE RELEASE TECHNIQUE AND MANUAL STATIC STRETCHING ON RELEASE OF UPPER TRAPEZIUS TRIGGER POINT IN DESKTOP USERS.

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Abstract

Objective: The increased daily usage of computers has made many musculoskeletal conditions worse. In Comparison to other parts of the body, problems are often seen in head, neck, and shoulder region. This study's goal was to contrast the impact of manual static stretching (MSS) and active release technique (ART) just on trigger point found in the upper fibers of trapezius muscle of two independent groups. One of the criteria used in the study was the cervical spine's range of motion.

Sample: The target population consisted of 30 volunteers (divided in half, 15 in each group), 20 to 45 years old, with TrPs in their upper trapezius muscles, who had been chosen from a variety of occupations involving in more than three hours of desktop use.

Methods: Prior to and following the intervention, during this therapeutic experimental examination, the result metrics between and across groups were assessed. groups A and B were established, and each group got active release technique and manual static stretching on various days with a 20-day follow-up. As a way to gauge the efficiency of the therapy, Range of motion was assessed before (day 0), in the middle of the treatment (day 10) and after the treatment (day 20).

Results: Patients in both groups with TrPs in upper trapezius saw a rapid improvement in range of motions after receiving ART and MSS ($P < 0.05$).

Conclusion: Both ART and MSS, manual techniques significantly decreased the discomfort caused by TrPs in upper trapezius of the two groups, by neither treatment outperforming the other.

INTRODUCTION

Musculoskeletal problems at work commonly involve the Upper Trapezius muscle. ^[1,2] Related or engaging exercise that yield repetitive stress, or micro tears causes constant pressure on filament, prompting the arrangement of trigger point. ^[3] In today's professions, computers are a need in which maximum job is carried out in the way of using computers ^[4]. Neck pain and limited head range of motion (ROM) might be caused by unbalanced tender tissue in the head and neck region. ^[5,6]. Bad posture offers an extended-time period low-depth stimulation to the upper trapezius muscle, which outcomes in the development of the pain-spasm cycle and, as a result of the reduced supply of blood,

oxygen, and nutrients to the muscle, sooner or later ends as in formation of muscle myofascial trigger points (MTrPs) [7].

MTrPs are delicate point and hyperirritable nodule [8] inside a skeletal muscle's inflexible band, which hurts when pressed, stretched, or contracted and generally reacts with referral pain patterns far from the point [9] and may be simply recognized through palpation with the aid of educated therapists [8]. Trigger points are identified as "active" and "latent." If the referral painful sample and any accompanying symptoms are clinically present, they are termed active, [10] latent whilst they're no longer clinically present but may be elicited with palpation [10], latent MTrPs were identified in most person skeletal muscle tissues [11]. The conventional treatment for trigger point consists of manual therapies, electro therapy, thermotherapy and cryotherapy [11,12]. The frequently used manual therapies are: massage, stretching, ischemic compression, and myofascial release technique [12]. Wet heat therapy has been suggested as a sort of thermotherapy for treating MTrPs since it has demonstrated improvement of local movement, relaxing of supporting muscle groups, and eliminating MTrPs' anxiety [12]. The most often used methods for relieving MTrPs include massage and stretching, both of which may occasionally produce quick pain relief [12].

Active Release Technique: Myofascial release is a method for releasing trigger points that can range from a simple rubdown to vigorous sensitive tissue massage [13]. The two main components of ART are: Specific movement by subject and Specific movement by therapist. [13] In ART, the tissue is initially positioned at compressed posture drawing the lesion inside it. Following that, the tissue is pulled below touch as the area is treated. The touch, manipulation, and movement range are determined by the lesion's nature and tissue reactivity [13,14]. The therapist may need to reposition the structure if the patient has extreme sensitivity and cannot do the movement necessary for therapy.

Manual Static Stretching: Stretching is another beneficial treatment for MF sensitivity [15]. Ylinen et al. observed that consistent stretching is a limited intervention which might efficaciously lessen neck pain as well as incapacity [16,17]. Clinical literature advocates the interventions that focus producing functional mobility using diagonal motion additives within the cervical spinal segments, including flexion/extension, lateral bending, and rotary movement [16,18].

This investigation is carried out to ascertain the two types of manual therapies improving the range of motion of trigger point sufferers and determining the impact of techniques and among these two which techniques showed better result on the subjects and helped in increasing neck range of motion in upper trapezius trigger point. The two manual therapies used in the study are Active Release Technique and Manual Static Stretching. Cervical range of motion is used as the parameter on comparison between the two techniques with evaluation pre and post treatment. We believed that the study will provide us best information and help us to know the best treatment for releasing of trigger point.

Abbreviations

ROM-Range of Motion, MTrPs-Myofascial Trigger Points, MPS-Myofascial pain syndrome, TrPs-Trigger Points, ART-Active Release Technique, MSS-Manual Static Stretching, MF-Myofascial, VDT-Visual display terminal, FHP-Forward head posture, TENS-Transcutaneous electric nerve stimulation

HYPOTHESIS

Alternative Hypothesis

1. Active release technique is more effective than manual static stretching on upper trapezius trigger point.
2. Manual static stretching is more effective than Active release technique on upper trapezius trigger point.

Null Hypothesis

Active release technique and Manual Static Stretching, both manual therapies are equally effective on the persons who have upper trapezius trigger points.

METHODOLOGY

STUDY DESIGN

This is comparative research, in which the effect of two therapies on trigger point is compared on the basis of range of motion as the parameter. Among active release technique and manual static stretching which therapy gave the better result and increased the range of motion.

SAMPLE METHOD

The subjects were randomly selected who had neck pain and trigger point was checked by examination.

A total number of 30 participants aged 20-45 years were selected who had pain and trigger point in trapezius upper fibers. They got split into two control groups at random, with 15 participants in each group.

- Group A – Active Release Technique

Active release technique was executed to release trigger point on the selected 15 participants.

- Group B – Manual Static Stretching

Manual static stretching was performed on the rest selected 15 participants to release trigger point.

DURATION OF THE STUDY

The study duration was 2 weeks plus 2 days (total 16 days).

INCLUSION CRITERIA

1. The total 30 subject will be included with age group between 20 years-45 years old. ^[7,16]
2. Prolonged computer / desktop / laptop users. ^[7]
3. Have use computer minimum 3-4 hour/day. ^[7]
4. Both male and female will be included in study.
5. Who can understand the procedure well!

EXCLUSION CRITERIA

1. The person who has musculoskeletal disorder, cervical pathology, radiculopathy, and any cervical deformity. ^[7,16]
2. The subjects of age group below 20 years and the age group exceeding 45 years will be excluded.
3. The subjects who are not using computers/ laptops at least for 3-4 hours a day.
4. Who are not able to understand the whole procedure!
5. Had myofascial pain treatment or a primary care doctor diagnose them within a month of the trial. ^[7]

INSTRUMENTS AND MEASUREMENT TOOL

1. Universal Goniometer, Pen, Paper

PROCEDURE

Participants who worked on a desktop (laptop, computer) for more than 3 hours each day were chosen at random. Using inclusion and exclusion standards, a total of 30 volunteers ages ranging between 20 to 45 were chosen with their complete consent to participate in the study.

1. Consent form: This form includes information on the study's requirements and expected outcomes, as well as an area for the subject to express their willingness to participate. The participants were informed of the study's confidentiality.

2. To validate the presence of a trigger point, a manual examination was performed. Subject was in sitting comfortable position and asked to localize the painful area around shoulder to neck region (over upper trapezius muscle). Further through manual examination presence of trigger point and its location was confirmed.
3. Quick assessment was done including demographic details, clinical history and examination included the range of motion in the cervical spine.
4. To evaluate ROM of cervical, each subject was requested to sit in a typical chair with back resting while maintaining a normal spinal posture. While in straight sitting posture, the cervical spine's Flexion, Extension, Lateral Flexion and Rotation, were all taken using the goniometer.
5. The subjects got separated in A-Group and B-Group, two groups of 15 each, and were assigned at random to a single group.
6. A-Group received Active Release Technique with a hot pack, while group B received Manual Static Stretching with a hot pack. With the baseline established, each treatment was given for 20 days (3week), including 10 sessions each on alternate days. (3WEEK 10 SESSIONS)
7. Participants in both groups sat comfortably with their backs supported for 10 minutes while a hydrocollator hot pack was administered to the upper trapezius muscle trigger points.
8. Group A: Active Release Technique
The tissue in the ART group is first shortened to confine the lesion within. Following that, the manipulation brings the tissue into touch with the lesion. Then further, by exerting pressure or tension to impacted upper trapezius muscle with the thumb or finger over the TrP, the affected upper trapezius muscle(s) were trapped. The subject was then directed to actively extend his or her neck from a shorter to an extended position by engaging in ipsilateral neck rotation and contralateral neck lateral flexion. The tension on the TrP was maintained at all times. (Fig.1) The patient sat backward in a chair, placing their hands on the thigh, while receiving ART for 20 minutes with a 10-second hold and 6 second rest in one set.
9. Group B: Manual Static Stretching
In Static Stretching group (SS), stretches done with each motion held for 10 seconds, aiming to lateral flex the top half of the trapezius, flex the extensor muscles, extend the flexor muscles, and flex and rotate the respective sides (Fig.2) One set was made up of this sequence. Five sets each on the right and left sides were completed by each participant. Between sets, participants were urged to take a 30-second break to avoid muscle damage and tiredness caused by stretching.
10. The range of motion of neck was assessed prior to the start of therapy, the first day of therapy, again midway through i.e., after five sessions, and lastly at the end of all ten sessions.

Fig.1: Group-A (Active Release Technique)



Fig.2: Group-B (Manual Static Stretching)



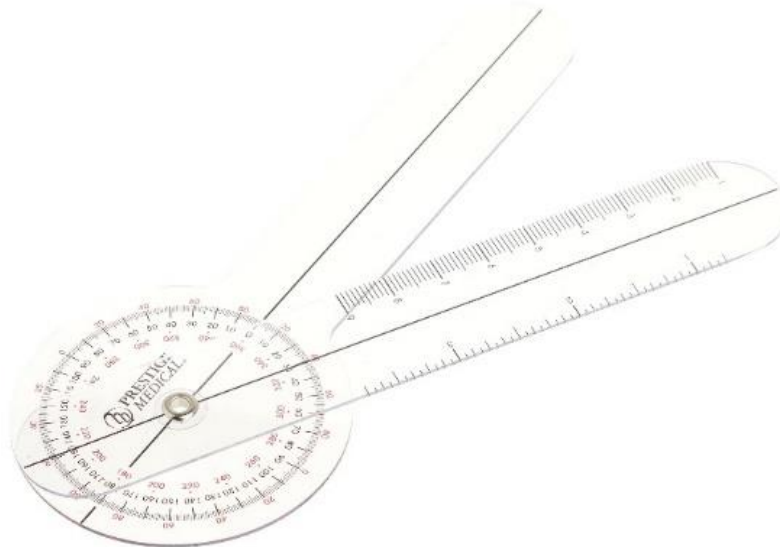
DATA ANALYSIS

The IBM SPSS statistics 26 programme was used to examine the data for 30 subjects. For each variable among the three measurements throughout time, the Mean & Standard Deviation values were determined. Groups comparisons were made by the independent t-test, while within-group comparisons were made using the paired t-test. Equality of variances was decided using Levene's Test, and equality of Means was determined using the t-test. There was a 95% degree of confidence in the statistical analysis. A P-value of less than 0.05 was used to determine statistical significance. MS-EXCEL 2019 was used to create the graphic illustration.

ANNEXURE

Goniometer used to measure range of motions of the cervical.

Fig.3: Universal Goniometer



RESULT

Individuals having upper trapezius trigger points, the variations in cervical ROM were compared. The study had thirty individuals, who were equally split into two groups (n=15) and every individual underwent two distinct trigger point treatments. The study was completed by all participants, and they were all included in the analyses. The demographic characteristics of the two groups were found to be significantly similar. Group A was given ART, whereas Group B was given MSS. All cervical ROM significantly improved in each group ($p < 0.05$), although the two groups didn't differ significantly from one another in enhancing cervical ROM ($p > 0.05$).

On analysis we found that, demographic information, such as age, height, and weight, are not significantly different of both the groups A and B ($P>0.05$) (Table1).

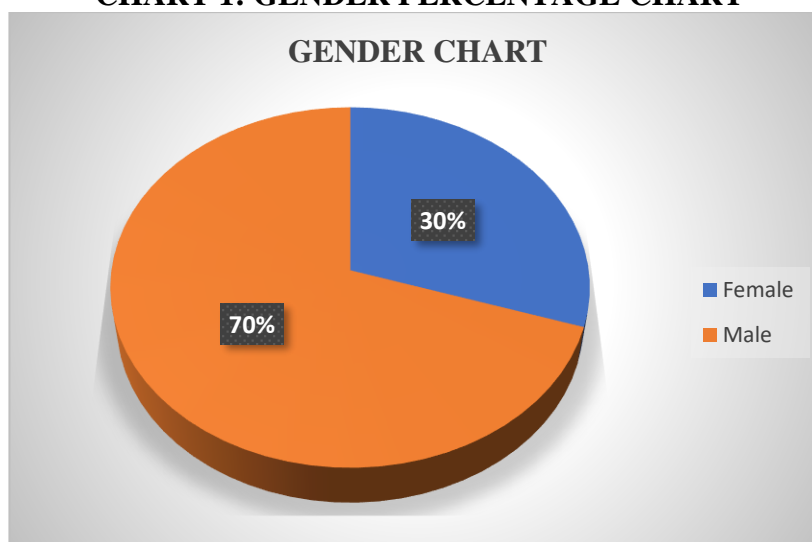
TABLE 1: DEMOGRAPHIC DETAILS OF SUBJECTS

Variable	GROUP A (ART) (Mean \pm Standard deviation)	GROUP B (MSS) (Mean \pm Standard deviation)	T value	P value
Age (year)	33.07 \pm 8.836	30.80 \pm 9.843	0.664	0.512
Height (m)	5.44 \pm 0.302	5.54 \pm 0.356	-0.830	0.414
Weight (kg)	69.93 \pm 14.330	72.80 \pm 11.791	-0.598	0.554

TABLE 2: TOTAL PERCENTAGE OF PARTICIPANTS BY GENDER IN THE STUDY

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	9	30%	30.0	30.0
Male	21	70%	70.0	100.0
Total	30	100%		

CHART 1: GENDER PERCENTAGE CHART



After giving both the treatments, all cervical ROM was significantly increased from day 0 to day 20 ($P<0.05$). As a result of the intragroup comparison, it can be stated that following the therapies, all ROM increased in both groups.

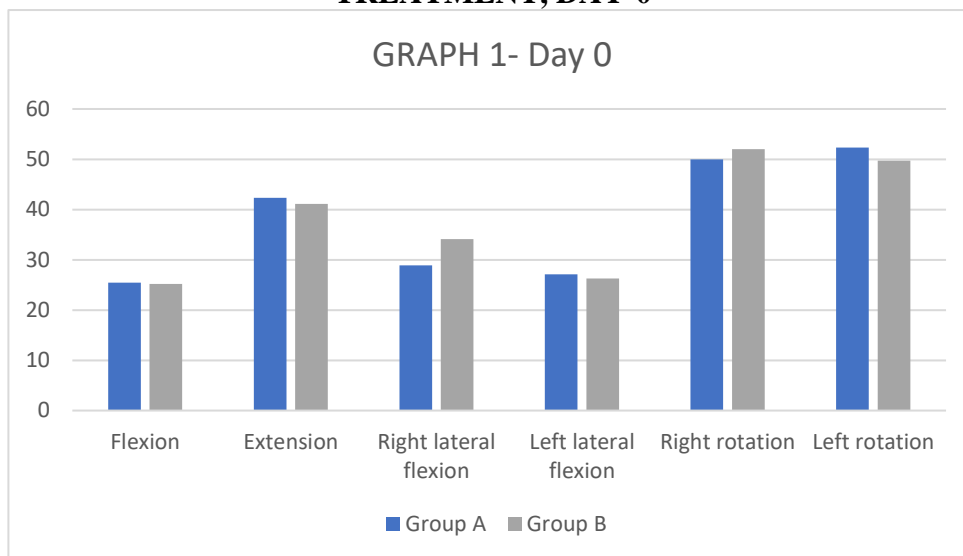
Intergroup comparison of all cervical ROM on day 0 for both groups A and B demonstrated no significant difference (TABLE 3), (Flexion: $F = 2.317, p>0.05$; Extension: $F = 2.307, p>0.05$; Right Lateral Flexion: $F = 1.658, p>0.05$; Left Lateral Flexion: $F = 0.114, p>0.05$; Right Rotation: $F = 3.922, p>0.05$; Left Rotation: $F = 3.467, p>0.05$).

TABLE 3: BEFORE TREATMENT VALUES OF EACH GROUP: DAY-0

Variables	Flexion	Extension	Right Lateral Flexion	Left Lateral Flexion	Right Rotation	Left Rotation
Group A	25.47 \pm 10.26	42.33 \pm 11.530	28.87 \pm 7.09	27.13 \pm 6.707	50.00 \pm 8.211	52.33 \pm 9.409
Group B	25.20 \pm 6.201	41.13 \pm 15.334	34.13 \pm 11.783	26.27 \pm 7.025	52.00 \pm 12.77	49.73 \pm 13.035
T value	0.86	0.242	-1.483	0.346	-0.510	0.626
Intergroup P value	0.932	0.810	0.149	0.732	0.614	0.536

The format of values is, Mean \pm SD.

GRAPH 1: INTERGROUP COMPARISON OF ROM TAKEN BEFORE THE TREATMENT, DAY-0



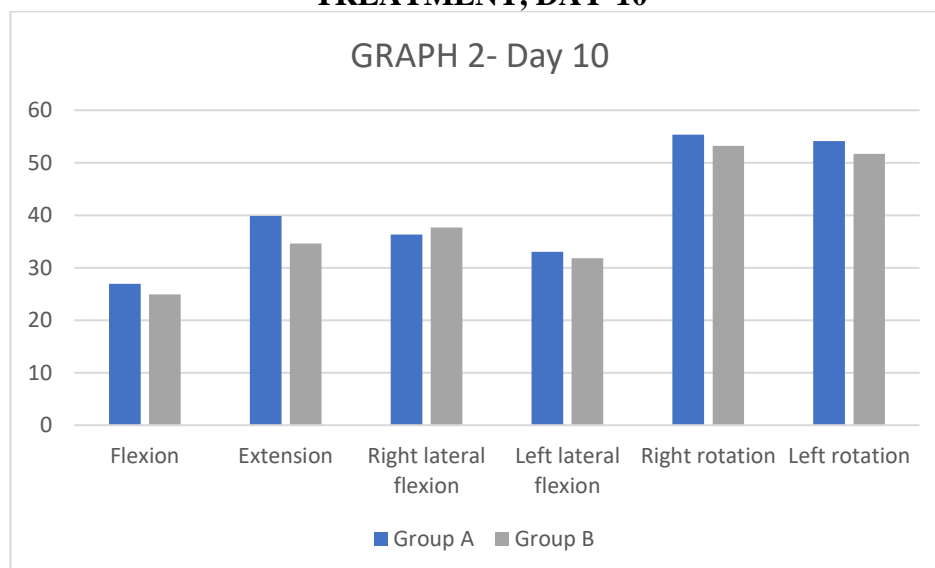
On day 10, both groups A and B's intergroup analysis of all cervical ROM showed no significant difference (TABLE 4), (Flexion: $F = 1.244$, $p > 0.05$; Extension: $F = 1.503$, $p > 0.05$; Right Lateral Flexion: $F = 1.781$, $p > 0.05$; Left Lateral Flexion: $F = 0.542$, $p > 0.05$; Right Rotation: $F = 2.679$, $p > 0.05$; Left Rotation: $F = 3.810$, $p > 0.05$).

TABLE 4: MID TREATMENT VALUES OF EACH GROUP: DAY-10

Variables	Flexion	Extension	Right Lateral Flexion	Left Lateral Flexion	Right Rotation	Left Rotation
Group A	26.93±9.051	39.87 ± 12.63	36.33±11.280	33.00 ± 6.665	55.33 ± 8.200	54.13 ± 8.271
Group B	24.93±6.541	34.60 ± 10.126	37.67 ± 9.352	31.80 ± 8.719	53.20±11.124	51.67±12.494
T value	0.694	1.260	-0.353	0.423	0.598	0.638
Intergroup P value	0.494	0.218	0.727	0.675	0.555	0.529

The format of values is, Mean±SD.

GRAPH 2: INTERGROUP COMPARISON OF ROM TAKEN MID OF THE TREATMENT, DAY-10



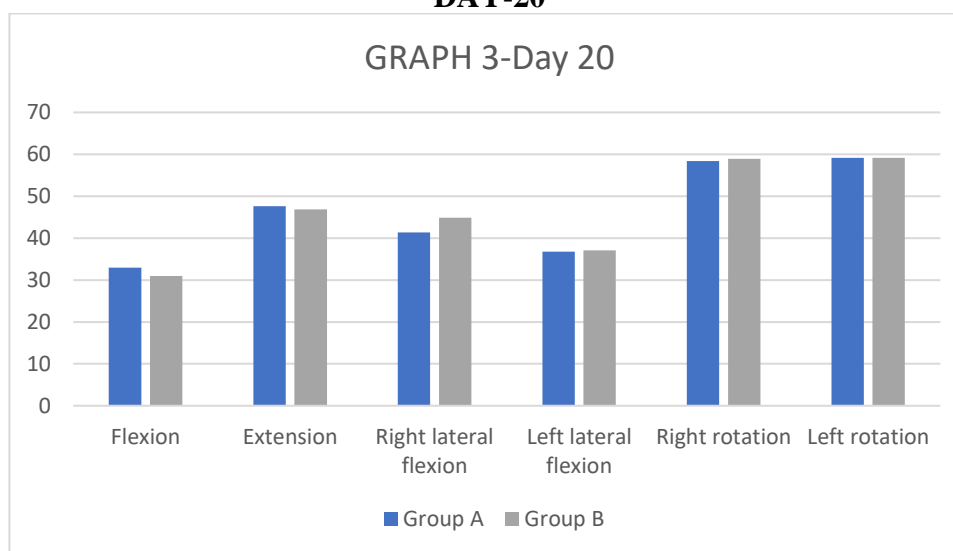
Groups A and B did not significantly differ from one another after receiving ART and MSS based on an intergroup analysis of all cervical ROM on day 20 (TABLE 5), (Flexion: $F = 0.570$, $p > 0.05$; Extension: $F = 2.233$, $p > 0.05$; Right Lateral Flexion: $F = 0.016$, $p > 0.05$; Left Lateral Flexion: $F = 2.395$, $p > 0.05$; Right Rotation: $F = 1.891$, $p > 0.05$; Left Rotation: $F = 4.072$, $p > 0.05$).

TABLE 5: AFTER TREATMENT VALUES OF EACH GROUP: DAY-20

Variables	Flexion	Extension	Right Lateral Flexion	Left Lateral Flexion	Right Rotation	Left Rotation
Group A	32.93±8.276	47.60 ± 10.041	41.33 ± 8.699	36.80 ± 6.538	58.40 ± 8.034	59.13 ± 7.754
Group B	30.93±6.670	46.87±13.495	44.87±8.911	37.07±12.83	58.93±11.21	59.13±12.722
T value	0.729	0.169	-1.099	-0.72	-0.150	0.000
Intergroup P value	0.472	0.867	0.281	0.943	0.882	1.000

The format of values is, Mean±SD.

GRAPH 3: INTERGROUP COMPARISON OF ROM TAKEN AFTER THE TREATMENT, DAY-20



DISCUSSION

It is well recognised that many underlying disorders might have trigger points.^[13] When working, such as using a computer, the trapezius is especially vulnerable to injury from repetitive motion of the hand and arm.^[5,19] Overusing a desktop, laptop, or other electronic device can result in trigger points, which are frequently observed in the upper trapezius or neck region and reduce the neck's range of motion. Active release technique and manual static stretching were the two manual therapies that were selected to treat the trigger point. In this study, we compared manual static stretching and active release technique using rom as an outcome measure, which was decreased because the upper trapezius of desktop users had trigger points. The stated hypothesis was that one of the two therapies is superior to the other and that both therapies have an equal impact on increasing range of motion. The 30 individuals were separated into two groups of 15 each (n=15), and each group received the two therapies for a total of 20 days of treatment. Three times throughout the trial, individuals' ranges of motion were assessed by a goniometer. Finally, the data was analysed, and the study's findings revealed that using ART and MSS quickly increased the ROM of every patient in the two groups ($P < 0.05$). Additionally, ART and MSS groups, who were having upper trapezius trigger points, showed improvement. But neither of the two methods was discovered to be better than the other ($P > 0.05$). Because the values of the analysed data don't seem to differ in any noticeable ways, the data supports the null hypothesis.

In one study, Golnaz and Majid (2016) compared the use of active release technique with that of muscular energy technique for treating upper trapezius latent trigger points present in students, instructors at a rehab centre, and employees at an engineering firm. The study's predetermined criteria included pain intensity, muscle thickness, and active cervical lateral flexion range. This study's findings, which showed that neither of the two treatments was superior to the other and that the treatment enhanced cervical lateral flexion ($p < 0.001$),^[7] partially supported our own findings.

In a similar manner, Djeinabou et al. (2016) examined the effectiveness of active release technique in reducing shoulder discomfort brought on by the TrPs exist among trapezius. The research participants got ART therapy, continued by stretching and the application of ice packs, and the outcome measure chosen were AROM and a numerical scale. The results of the 3 chosen individuals, who had 6 sessions^[13], supported the finding of our current investigation that active release technique proved to be beneficial in extending patients' range of motion since they have trapezius trigger points. Also, Jun Ho Kim et al. (2015) contrasted joint mobilisation and active release technique. They found that there was a Statistically Significance variation in ROM comparing pre- and post-intervention, but not between the ART group and the joint mobilisation group. However, the ROM difference and other outcome differences were higher in the ART group in comparison to the joint mobilisation group. This study so does not entirely concur with our current study.

The results of a different investigation by Du- Jin Park et al. (2018) partially corroborate our current findings. The study concentrated on two stretching techniques used on sedentary workers who were experiencing neck pain. The active ROM of the cervical spine, pressure pain threshold, NDI, and flexion relaxation ratio were assessed before as well as after the therapy to compare static stretching to diagonal active stretching. However, the data of right and left rotation were significantly increased in diagonal stretching ($p < 0.05$) instead of static stretching, so this specific result for rotation is against our study. The effects of both stretching techniques when compared to before treatment, cervical ROM in the directions of flexion, extension, and lateral flexion considerably increased ($p < 0.05$) and seem to support the present study. In research by James^[17] with 20 young men who had no lower limb injuries, hamstring elasticity increased right away the use of ART. Similar to that, once ART was applied to the trapezius for 20 days in the current investigation, ROM considerably increased. This research implies that ART can remove damaged tissue, which can limit soft tissue's movement and so reduce movement restrictions^[20].

Jun Ho Kim, et al. also specify that ART is a technique for treating soft tissues like tendons, nerves, and myofascia. It is used to address acute injuries, functional fixation damage brought on by prolonged, aberrant posture, and repetitive strain injuries. Additionally, the adherent soft tissue that manifests as discomfort, spasm, trembling, weak muscles, and other signs as well as scar tissue adhesion is successfully resolved by ART.^[5] William J. Hanneya et al (2017) data support the theory stating that, although manual stretching has the ability to extend a muscle by decreasing tissue contractures and pain, yet it is unlikely that a muscle may be properly expanded after just one therapy. According to a number of studies, deep stretch-related discomfort is more tolerable for people with enhanced psychosomatic tolerance than it is for people with immediate improvements in ROM.^[15]

Limitations and Future scope:

Therefore, there is often no significant difference found, the change in cervical range of motion (ROM) shown a persistent trend to be higher in the ART and MSS group, and the two groups' comparison proved to be equally effective. It is still unknown how long a treatment's effectiveness is sustained because this study only assessed how it performed during a brief 20-day timeframe. Furthermore, since the sample size is so tiny, it is challenging to generalise our results. Additionally, the internal validity might not be enough. More research is required to support these findings, and future studies should take these limitations into account and move forward utilising a combined

analysis to look at the impacts of active release technique and manual static stretching on trigger points and compare them to other therapies in a more unbiased way.

CONCLUSION

The conclusion of our study is as follows: The two procedures were used to diminish trigger points and improve range of motion in participants who spent a lot of time at their desktops. Active release technique and manual static stretching were chosen as the two therapies to be conducted independently in groups. It was determined that there was no discernible difference between the two therapies and that neither therapy was superior to the other. A result of $p > 0.05$ was achieved after assessing the groups, and the investigation also revealed that both treatments increased range of motion in each group.

The study's finding was that for removing trigger sites in trapezius upper fibers and expanding ROM of cervical can be accomplished with both active release technique and manual static stretching.

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