



## EFFECTS OF MYOFASCIAL RELEASE TO NECK MUSCLES ON WRITING SPEED IN UNDERGRADUATE STUDENTS

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### ABSTRACT

- **BACKGROUND:** According to studies Neck pain is quite common in students which leads to reduced productivity. Overactivity of neck muscles like upper trapezius and levator scapulae may cause neck pain. Studies have identified that prolong and continuous writing task show overuse of upper trapezius and altered motor control pattern.
- **AIMS :** To study effects of Myofascial Release to upper trapezius and levator scapulae on writing speed and grip strength .
- **MATERIALS :** Consent form, Pinch Dynamometer, Ball point pen, Paper , Stopwatch
- **METHOD :** Intervention study design with 30 sample size was selected for the study using inclusion and exclusion criteria . Study was approved by ethical committee of college. The participants were divided in two group, 15 students in each group. Group 1 underwent Active stretching with Myofascial Release and Group 2 underwent only Active stretching for 4 weeks. Myofascial Release was given thrice weekly . Outcome measures were pinch grip strength and writing speed . Pinch grip strength was measures by pinch dynamometer and writing speed was measured by letters per minute test.
- **RESULTS :** The results were analysed by Mann Whitney U test to see the results and compare the difference of both groups. The results shows Myofascial Release with active stretching showed significant results on grip strength and writing speed.
- **CONCLUSION :** The study concluded that there is significant increase in grips strength by Myofascial release and Active stretching together as compared to only active stretching.
- **KEYWORDS :** Myofascial Release, upper fibres of trapezius , Levator scapulae, Grip strength, Neck pain.

### INTRODUCTION

An aching or discomfort in the anatomical area between the occiput and the third thoracic vertebra, as well as laterally between the middle edge of the scapula, is known as neck pain.<sup>[1]</sup> In the general population, the prevalence of neck pain ranges from 16.7% to 75.1 percent.<sup>[1]</sup> Neck pain can be caused by a variety of factors, including poor posture, stress, spondylosis, and prolonged position.<sup>[1]</sup> Symptoms include pain in the shoulder, arms, and forearms, as well as headaches and neck stiffness.<sup>[1]</sup> Spasms of neck muscles such as the trapezius and levator scapulae can induce neck pain. Any occupation that requires long-term postures and repetitive motions has been linked to a high prevalence of chronic neck and shoulder diseases.<sup>[1]</sup> It is frequently generated by the employment of the same motor units repeatedly and extensively. Many previous studies have looked at the static neck and upper limb postures linked with computer use and discovered low-level muscle activity in the neck and shoulder stabilisers.<sup>[1]</sup>

According to a study conducted by Siriluck Kanchanmai in 2011, neck pain is fairly widespread among undergraduate students.<sup>[2]</sup> There are just a few risk variables that have been proposed to predict the onset and persistence of neck pain. The health of undergraduate students in the future should be taken into account. However, there is still a lot of confusion about what causes neck pain, and further research is needed throughout the task. Neck pain causes a lot of pain, incapacity, and a lower quality of life, and it can even impede your career. The overall yearly cost of neck and upperlimb problems in the Netherlands, according to Bernard et al, is owing to lower production, sick leave, and chronic impairment for work. Adolescents experiencing neck pain are at a higher risk of developing adult-onset symptoms. Childhood may be the source of long-term chronic neck pain. Thus, understanding of effective therapies in the younger population is critical for reducing the prevalence of neck discomfort in adults. Grip strength of the hand refers to overall muscle strength as assessed by a hand dynamometer, which is the gold standard for grip strength and endurance testing. A dynamometer can measure the static force of a hand grip. According to studies, people with unilateral upper limb chronic pain have a 20-30% lower hand grip strength loss than people on the non-painful side. Furthermore, unilateral musculoskeletal pain causes grip initiation and relaxation to be delayed. Grip strength is merely a measurement of the hand's isometric contraction.

Physical therapy can help improve the strength and endurance of the intrinsic muscles of the hand. One of the most frequent treatments used by physical therapists to treat muscular spasms is myofascial release (MFR). MFR is a low-load, long-duration stretch administered to the fascial complex with the goal of restoring appropriate length, reducing discomfort, and improving function. The viscoelastic and piezoelectric capabilities of connective tissues have been claimed to be restored by using MFR, according to studies. The fascia is significantly elongated, then the fascia returns to its normal length. MFR has been

shown to reduce discomfort and improve grip strength in patients with lateral epicondylitis in recent research. [3]

Recent research has established a link between neck pain and hand grip strength. Long writing assignment that relates to a student's day-to-day activities. Lengthy-term writing also necessitates the constant and repetitive manipulation of the upper limb, as well as neck control, over a long period of time. As a result, it was discovered that prolonged and continuous writing tasks result in upper trapezius overuse. In 2018, a study was conducted in which grip strength was measured using a dynamometer and writing speed was measured using the letters per minute (LPM) test<sup>[4]</sup>, with the results showing a positive relationship between grip strength and writing speed (endurance). [5]

Ten female volunteers participated in a study on the effects of sitting postures on the neck and shoulder during arm-hand work movements. At six different locations, E.M.G. electrodes were applied unilaterally. When the arm/hand moved along the high area of the work item compared to the low part, there was a propensity for a higher degree of activity. Sitting postures had a substantial impact on the amount of activity during the standardised task movement with arm/hand.

## Materials and Methods:

Materials required for the study were Consent form, Pinch Dynamometer, Ball point pen, Paper, Stopwatch. Participants were selected according to the inclusion criteria. The study was approved by ethical committee of College of Physiotherapy Tilak Maharashtra Vidyapeeth. All the participants were instructed about the procedure, benefits and consequences of the study. Questions asked by participants were answered. A consent form was signed by all the participants. Participants were divided into two groups. There were 15 participants in each group. Group 1 underwent Active stretching with Myofascial Release and Group 2 underwent only Active stretching. All 30 students participated in the study had a history of neck pain, 14 of them had persistent neck pain for more than 2 weeks. A questionnaire was filled by students where it was seen that students had to write for more than 2 hours per day. Students experienced neck pain after writing for more than 2 hours. While writing an exam that discomfort affected their handwriting and writing speed. The study was carried out for 28 days. Grip Strength and writing speed of all the participants were recorded on day 1 and follow up was done day 7, day 14, day 21 and day 28. All the participants were taught active stretching of Trapezius and Levator Scapulae. They were asked to do self stretching daily for 28 days. Whereas Group 1 which was the experimental group received Myofascial release thrice a week which included releasing trigger point and spasm in upper fibres of Trapezius and Levator Scapulae. The outcome measures were pinch grip strength and writing speed. Pinch grip strength was measured by standardized pinch dynamometer in lbs or pounds. And writing speed was measured by letters per minute test. The participants were asked to sit in a comfortable chair, the elbow joint was flexed 90 degrees elbow was supported on the arm rest and, forearm and wrist were in neutral position. For grip strength, the subject was asked to squeeze the dynamometer and readings

were noted. For writing speed assessment Letters per Minute Test was used. A stop watch was used to keep track of time. Each subject received an A4 size paper with a paragraph, as well as a ball tip pen. Students were given one minute to copy the passage. The number of letters written in one minute was tallied.

#### SELECTION AND DESCRIPTION OF THE PARTICIPANTS :

Subject selection: An Intervention study of 30 students with neck pain in both genders from Graduation colleges of Pune.

#### Inclusion Criteria :

- Age group -18 – 24 years.
- Both the gender.
- Students with neck pain

#### Exclusion Criteria:

- Recent history of fracture or any other injury to shoulder, arm and hand.
- Any recent surgery of arm or hand
- Any neurological condition

RESULT : The results were analysed by Mann Whitney U statistics test. Mann Whitney U test is the non parametric alternative test to the independent sample t-test.

Table No. 1- Mann Whitney U Test for Grip Strength.

GripStrength	No. Of Subjects	Sum of Rank	P value
Group 1	15	263	58
Group 2	15	178	
Total	30	441	

Critical Value : 64

Grip Strength was measured and analysed which gave us the p value 58 which is less than critical value 64. Hence there is significant difference in Grip Strength of group 1 and group 2. The study rejects the null hypothesis and accepts the alternative hypothesis.

Table No. 2 - Mann Whitney U Test for Writing Speed .

Writing Speed	No. Of Subjects	Sum of Rank	P value
Group 1	15	245	63
Group 2	15	183	
Total	30	428	

Critical Value : 64

Writing speed was recorded and analysed which gave p value 63 which is less than critical value. Hence there is significant difference between group 1 and group 2. The study rejects the null hypothesis and accepts the alternative hypothesis

**DISCUSSION:** Purpose of this study was to see the effects of MFR on grip strength and writing speed. Myofascial Release was chosen as an intervention because it is one of the common techniques which is used by physical therapist to manage muscle spasm. MFR focuses on soft tissue or fascia that is tight or in spasm.<sup>[6]</sup> Techniques of direct MFR were used such as kneading, rolling, releasing trigger points and taut bands.<sup>[6]</sup> Gender differences were also seen, with males having a firmer grasp. The study's goal was to see how MFR affected writing and grip strength, which would help therapists manage writing challenges, which were followed by neck pain, weak musculature, and poor grip strength. Recent research has established a link between neck pain and hand grip strength. Long writing assignment that relates to a student's day-to-day activities. Lengthy-term writing also necessitates the constant and repetitive manipulation of the upper limb, as well as neck control, over a long period of time. As a result, it was discovered that prolonged and continuous writing duties result in upper trapezius overuse. Active stretching can be beneficial in reducing tightness of the muscles it can help in obtaining optimal muscle length. Stretching relaxes the muscles and helps in better contraction. Prolonged writing for an average hours of 5-6 hours per day was seen in most of the students. After writing for almost 5-6 hours all the students experienced neck pain, muscle fatigue. After MFR pain was significantly less which allowed the students to write more efficiently. The results of this study shows significant difference between group 1 and group 2. The experimental group has shown better results as compare to the control group.

**CONCLUSION:** This study has concluded that Myofascial Release and Active stretching is effective to reduce spasm of the neck muscle and increasing grip strength and writing speed. There was significant difference in experimental and control group. Both the groups has shows good results but Myofascial Release with active stretching gave better results than Active stretching alone.



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