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# The Effect Of Manual Therapy On Myofascial Trigger Point Syndrome Upper Trapezius

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**Abstract**

MTP's in the Upper Trapezius muscle is a condition where there is a pain point along the trapezius muscle which contains a collection of symptoms and complaints due to spasm or shortening of the trapezius muscle which is often felt as a stiff neck or nape, various manual therapy modalities are expected to be able to overcome this complaint. This study uses a quantitative approach with non-parametric test statistics. This study is a quasi-experimental case study with a treatment group without a control group with 10 research subjects who experienced MTP's in the Upper Trapezius muscle given manual therapy actions consisting of C0-C1; C2-C6; C7-T1 traction and stretching the upper Trapezius muscle, Friction sub occipitalis muscle. The parameters observed were pain in motion and joint range of motion. The action was given 3 times for two weeks, respondents will be examined before and after the 3rd therapy. There was a decrease in pain and LGS after manual therapy intervention was given with a significance value (p 0.001) in the influence test using the Willcoxon Test. From the results of this study, it was found that there is an influence of manual therapy on the MTP's Upper Trapezius muscle which can reduce patient symptoms and complaints.

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## INTRODUCTION

Pain caused by triggers or spam in muscles is known as myofascial trigger points. Local pain trigger points that are indicated by irritation, inflammation, and swelling are known as trigger points. Pressure will cause hypersensitive pain.

MPTS is usually caused by non-stop muscle contractions, which can be caused by incorrect body posture or work activities that stretch the muscles too much. Local ischemia is produced by these contractions, which causes the accumulation of lactic acid and carbon dioxide substances in the myofascial tissue. This ischemia inhibits the flow of blood and oxygen to the tissues, causing a lack of nutrients and oxygen as well as a buildup of metabolic waste. This mechanical stress causes pain in the nociceptors in the muscles and tendons (Syurrahmi et al., 2023).

MTPS (Myofascial Trigger Point Syndrome) is a condition where there are painful points in the muscles which can cause pain in certain areas. In the cervical and shoulder areas, MTPS can cause symptoms in the form of pain, stiffness and limited movement in the Upper Trapezius (Dilek et al., 2021). Upper trapezius MTPS is common in the general population; prevalence in Indonesia reaches 40% in 1 year (Syurrahmi et al., 2023).

A study conducted by (Rahmawati, 2020) showed the relationship between the duration and position of smartphone use and neck pain in 30 physiotherapy student respondents at the Muhammadiyah University of Surakarta. Showing that 60% of physiotherapy students at the Muhammadiyah University of Surakarta experienced mild neck pain and 27% experienced pain. medium neck.

Activities that involve poor body posture, such as forward head posture and sideways head posture, can cause stress or load on the upper trapezius muscles. Likewise, working with less than optimal ergonomics, such as maintaining a static position for a long period of time or lifting weights that exceed muscle capacity, can also cause muscle compression. Using a smartphone for a relatively long time in an unergonomic position can cause various complaints, especially MTPs (Hernata Putri & Sulistyaningsih, 2020).

Stiffness in the muscles, especially the upper trapezius, limited movement, and tenderness at the trigger point location are three signs that must be present for at least three months to confirm the presence of MTPs (Karnadipa et al., 2023).

Activities that involve poor body posture, such as forward head posture and lateral head posture, can cause stress or burden on the upper trapezius muscles. Likewise, working with less than optimal ergonomics, such as maintaining a static position for long periods of time or lifting weights beyond the capacity of the muscles, can also cause muscle

compression. Using a smartphone for a relatively long time in an unergonomic position can cause various complaints, especially MTP's.

Myofascial trigger point syndrome (MTP's) can appear in various muscle groups with the most common locations being muscles involved in maintaining posture, such as the levator scapula, upper trapezius, sternocleidomastoid, scalene, and quadratus lumborum muscles. The upper trapezius muscle is very susceptible to MTP's and is most sensitive to pressure compared to other muscles (Pawaria & Kalra, 2015).

The manual massage method or manual therapy consisting of myofascial release aims to stretch the fascia, reduce tissue adhesions, and improve soft tissue structure. This allows for reduction of pain and restoration of normal function thus effectively reducing tenderness and tolerance to pressure on the myofascial trigger point of the upper trapezius muscle (Maruli et al., 2014).

Manual therapy with a combination of pressure and light stretching on certain muscles helps stretch and soothe fascia (myofascial) structures and sticky muscles. This can help reduce pain, especially in cases of myofascial trigger point syndrome (Rodríguez-Huguet et al., 2020).

The hold relax technique is a physical therapy method used to reduce pain, joint stiffness, increase muscle strength, and functional activity in various conditions, including myofascial pain syndrome (MPS), osteoarthritis, and plantar fasciitis. This technique is carried out by asking the patient to perform an isometric contraction of the targeted muscle for 5-10 seconds. This isometric contraction will stimulate the Golgi tendon organ (GTO) to release inhibitory impulses which will inhibit the contraction of the antagonist muscle (Imran et al., 2021).

Contract relax is a stretching technique that combines isometric muscle contraction with passive stretching. This technique aims to relieve muscle tension and increase joint range of motion. After an isometric contraction, the muscle is then passively stretched. This passive stretching will help stretch soft tissue structures such as muscles, fascia, tendons and ligaments that are pathologically shortened (Putri et al., 2021).

The friction technique in physiotherapy is a massage technique on trigger points using stronger pressure to relieve muscle tension. This technique can help reduce muscle tension and increase blood circulation in the area affected by MTPS. The release of body biochemicals such as histamine and serotonin triggers vasodilation and blood vessel permeability, which mechanically improves the structure of muscle tissue. Myofascial release techniques that focus on pressure or friction can lengthen the myofascial with the aim of releasing tissue adhesions and reducing pain through gate control theory, improving the quality of fascia tissue fluid, tissue flexibility, and the ability to move (Lai et al., 2023).

Passive stretching can activate the Golgi tendon organs, which then send afferent nerve impulses to the dorsal roots of the spinal cord. As a result, efferent motor neuron impulses can be stopped, which reduces muscle tone and makes the sore muscle lengthen. This can help reduce pain and persistent muscle contractions (Lestari, 2018).

Studies have shown that passive stretching can reduce MTPS pain. For example, research using wrenching as a form of passive stretching found that workers who received this procedure experienced a significant reduction in pain. Another study also found that isometric and isotonic exercises can improve functional ability and reduce MTPS pain.

So far, there is no clear standard for handling MTPS in the upper trapezius muscle, in hospitals the majority only give Infrared (IR), Transcutaneous Electrical Nerve Stimulation (TENS) and Exercise. The principles of developing a therapy manual protocol involve a systematic and evidence-based approach. Some general principles to consider include comprehensive patient evaluation, selection of appropriate manual techniques based on diagnosis, patient safety, and clear treatment goals. Additionally, it is important to pay attention to current research and clinical guidelines in developing a therapeutic manual protocol.

An analytical study is needed considering the large number of cases of MTPS which can cause a decrease in functional neck movement in adolescents to the elderly. Additionally, no review has been conducted on this issue (Sunyiwara et al., 2019). So this study aims to determine the effect of manual therapy on upper trapezius myofascial trigger point syndrome.

## METHODS

This research has an ethical permit issued by KEPK FIK Universitas Muhammadiyah Surakarta, namely Number 637/KEPK-FIK/XI/2024. This type of research is included in quantitative research experimental study. This research uses quantitative descriptive methods. The research was conducted at the Colomadu physiotherapy clinic, Karanganyar Regency, Central Java in July-September 2024.

The respondents studied were students at the Universitas Muhammadiyah Surakarta who experienced MTP's Upper Trapezius. When this research was conducted in July-September 2024, the number of respondents who met the inclusion criteria was 10 people.

### Sampling Procedures

In this research, Universitas Muhammadiyah Surakarta (UMS) students were the population. From the data that has been collected, there are 10 people who meet the inclusion criteria: a) The patient is diagnosed with MTPS in the upper trapezius muscle, b) The patient is a UMS student, c) The patient is willing to take part in the research.

In addition, this study also had exclusion criteria: a) Patients with other medical conditions that could affect the research results, b) Patients with allergies to manual therapy.

**Materials and Apparatus**

In this study, the following research instruments were used: a) Numerical Rating Scale (NRS) is a scale used to measure pain intensity. This scale consists of numbers from 0 to 10, with 0 indicating no pain and 10 indicating very severe pain. b) LGS or Range of Motion is a research instrument used to assess patient movement function. The LGS consists of several items that assess various aspects of movement, such as range of motion, strength, coordination, and balance.

Pain is an unpleasant stimulus caused by actual and potential tissue damage. A person's ability to carry out daily life activities independently is known as their own functional ability (Wulandari et al., 2023).

**Procedures**

This research procedure begins with filling out a questionnaire as an initial screening to determine whether the research subjects meet the inclusion and exclusion criteria via a Google form which contains several questions. The questions used are as follows:

a) Do you often sleep with more than one pillow?

b) Do you often experience neck and shoulder pain?

c) Do you often experience tension in your right/left shoulder muscles?

d) Do you often feel your neck tense until your head feels dizzy or your vision becomes blurry/unclear?

e) Do you often feel your appetite decreases when you are hungry?

f) Do you feel easily angry/emotional after feeling tension in your neck muscles?

g) Do you have high blood pressure, especially diastolic pressure, when you feel neck pain?

h) Do you experience problems when you feel neck and shoulder pain?

i) Is there a clicking sound when you have neck and shoulder pain when you open your mouth?

j) Do you experience tingling or soreness in your arms when you have neck and shoulder pain?

After filling in the questionnaire and selecting 10 respondents who fit the criteria, the respondents will then measure pain again after manual therapy by asking the patient to state the level of pain felt in the upper trapezius muscle using the NRS scale. In addition, measurement of the joint range of motion (LGS) of the neck and shoulders before and after administering manual therapy.

Physical examination can include palpation of tender points in the muscles, examination of Upper Trapezius movement, and the patient's medical history can help determine risk factors and causes of MTPS, such as a history of injury or excessive physical activity.

Then intervention is provided in the form of manual therapy with several techniques such as hold relax, contra relax, friction, passive stretching and PACVP (Postero-Anterior Central Vertebral Pressure).

**Design or Data Analysis**

This study uses the following data analysis method: a) Respondent characteristics know the characteristics of respondents such as age, gender, height, weight and BMI. b) Normality test is carried out to determine whether the data in a group of data or variables is normal or not. The data normality test in this study used the Shapiro-Wilk test because there were less than 50 respondents. c) Test the effect is used to find out how big the effect of a treatment is. In this study, the effectiveness test used a paired test sample t test because the samples are paired with the same subjects in different conditions, namely before rehabilitation and after rehabilitation with normally distributed data. Meanwhile, for data that is not normally distributed, use the Wilcoxon test. The significance of the p value in this study is p>0.05.

**RESULT**

This research was carried out at on 10 respondents from UMS students who experienced MTP's pain, with the following characteristics:

**Table 1.** Characteristics of Respondents

| Variabel | Value (n or mean ±SD) |
|---|---|
| **Gender** | |
| Man | 9 |
| Women | 1 |
| Age (years) | 22.40 ± 0.516 |
| Height (cm) | 169.10 ± 5.195 |
| Body Weight (kg) | 74.20 ± 8.753 |
| BMI (kg/m$^2$) | 25.50 ± 2.321 |

Source: Primary Data

Based on the data above, it is known that the majority of respondents were male, totaling 9 people and female, totaling 1 person. The average age of respondents was 22.20, with an average BMI value of 25.50.

**Table 2.** Pain Research

| Variabel | T1 | T3 |
|---|---|---|
| Pre test NRS | 6.10 | 2.80 |
| Post test NRS | 3.40 | 0.50 |

Source: Primary Data

Information :

T1: First Meeting

T3: Last Meeting

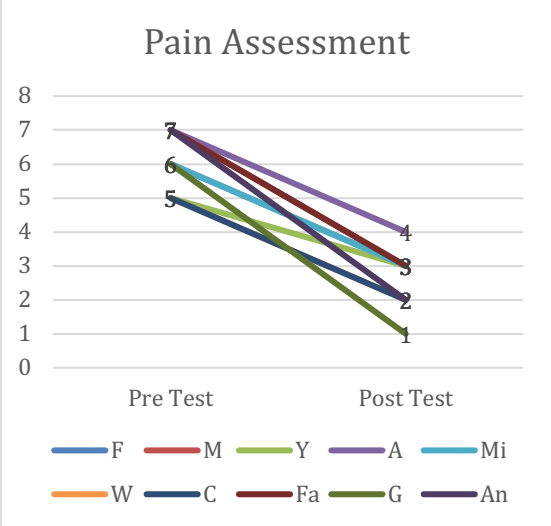


**Fig 1.** Pain Assessment Chart

From the data above, it shows a decrease in pain both in the pre-test at the first meeting, obtaining an average pain measurement value of 6.10 to 2.80 at the last meeting. Meanwhile, in the post test, pain measurement at the first meeting

showed a value of 3.40 to 0.50 at the last meeting.

**Table 3.** LGS Measurements

| Variabel | Average LGS Increase |
|---|---|
| Pre test LGS | 8.85 |
| Post test LGS | 2.63 |

Source: Primary Data

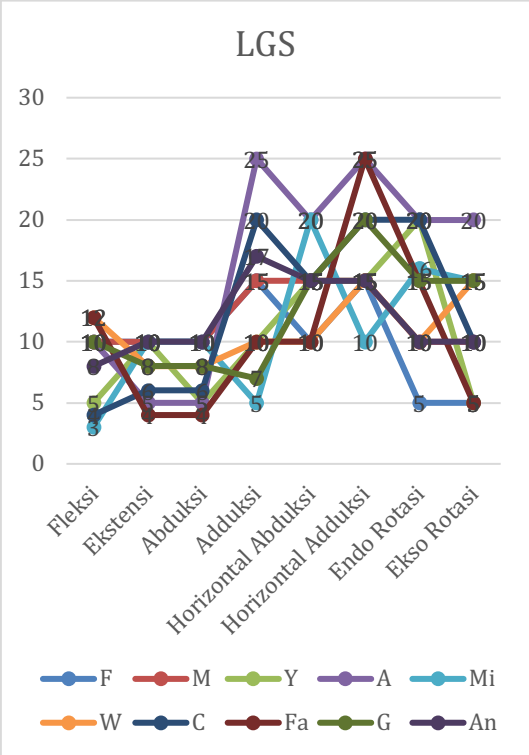


**Fig 2.** LGS Measurements

The data above shows the average value of improvement in LGS, in the pre test the LGS measurement shows an average value of 8.85 and in the post test the LGS measurement shows an average value of 2.63.

**Table 4.** Shapiro-Wilk Data Normality Test

| Variabel | *p-value* |
|---|---|
| Pre test NRS | 0.074 |
| Post test NRS | 0.004 |
| Pre Test LGS | 0.001 |
| Post Test LGS | 0.001 |

Source: Primary Data

From the data from the data normality test using Shapiro-Wilk, the post test value of the NRS measurement shows a p-value of 0.004 and in the post test the LGS measurement shows a p-value of 0.001, the data shows that the p-value <0.05 which means the data is not normally distributed.

**Table 5.** Willcoxon Hypothesis Test

| Variabel | *p-value* |
|---|---|
| Pre test NRS – Post NRS | 0.001 |
| Pre Test LGS – Post LGS | 0.001 |

Source: Primary Data

Hypothesis:
H0: There is an effect of manual therapy on the MTP's Upper Trapezius muscle which can reduce the patient's symptoms and complaints.
H1: There is no effect manual therapy on the MTP's Upper Trapezius muscle can reduce the patient's symptoms and complaints.

From the table above there is a Willcoxon test and it shows the Asymp results. Sig. 0.001 < 0.05 from this value it can be concluded that there is an influence of manual therapy on the MTP's Upper Trapezius muscle by reducing the patient's symptoms and complaints.

## DISCUSSION

Based on the data obtained in table 5, there is a significant influence on the improvement of symptoms and complaints of patients with MTP's Upper Trapezius muscle ($p<0.05$) as indicated by a decrease in pain as measured by the NRS (Numerical Rating Scale) in table 2. This is in line with findings from a study conducted by Saraswati et al., (2018)

there is an effect Manual pressure relief shows mixed results, but generally shows moderate to major reduction in pain and improvement in function. This is in line with research showing that manual pressure release techniques can increase blood flow to the affected area, relieve muscle spasm, and reduce tension.

Apart from that, other research also states that manual therapy has been proven to be effective in reducing pain associated with myofascial trigger points (Guzmán-Pavón et al., 2022).

The symptoms complained of by respondents were pain and limited joint range of motion (LGS) in the Upper Trapezius muscle (Dilek et al., 2021). In this study, the average value of LGS increased after being given intervention in the form of manual therapy was obtained, which is shown in Table 3. This research is in line with the results of research conducted by (Guzmán-Pavón et al., 2022) which states that manual therapy is effective in increasing joint range of motion (LGS) in individuals with MTP's. The mechanism that occurs in increasing LGS involves mobilization which can reduce pain through stimulation of peripheral mechanoreceptors and inhibition of nociceptors, as well as increasing joint mobilization by improving exchange between synovial fluid and cartilage matrix (Akhadiany et al., 2022).

Providing manual therapy in the form of friction, muscle stretching with hold relax, contract relax, and passive stretching techniques as well as PACVP can reduce symptoms and complaints from MTP's in the Upper Trapezius muscle as shown in table 5. The use of this hold relax technique can have an effective influence in reducing trapezius muscle myofascial pain (Sunyiwara et al., 2019). The Contract relax technique involves gradual muscle contraction and relaxation to reduce tension and increase muscle flexibility which is effective in reducing pain and increasing LGS (Pratama, 2013). Apart from that, emphasis on the Upper Trapezius muscle using either friction or PACVP can reduce MTP's pain and reduce complaints in the form of pain (Puspitaningrum, 2014).

A limitation in this research is the lack of female respondents where the prevalence of MTP's is almost the same between men and women. Apart from that, this study did not include functional variables for the neck or shoulders.

## CONCLUSION

Based on the results of research conducted by researchers, it can be concluded that there is an influence of manual therapy on the MTP's Upper Trapezius muscle which can reduce patient symptoms and complaints.

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