

## Original Research

### Different Effects of Giving Myofascial Release 90 Seconds and Myofascial Release 300 Seconds in Reducing Myofascial Pain Syndrome in the Upper Trapezius Muscle

Arif Abdullah<sup>1</sup>, Arif Pristianto<sup>2\*</sup>

<sup>1</sup>Instalation of Medical Rehabilitation, RS Muhammadiyah Selogiri, Wonogiri, Indonesia

<sup>2</sup>Departement of Physiotherapy of Universitas Muhammadiyah Surakarta, Sukoharjo, Indonesia

#### ABSTRACT

**Background:** Neck pain is the most common complaint and is often encountered in Indonesian society, especially among workers with static neck postures. One of them is a batik craftsman, whose sedentary position causes pain, especially in the upper trapezius area, which is often called Myofascial Pain Syndrome. The aim is to find out how 90 second myofascial release and 300 second myofascial release differ in terms of reducing myofascial pain syndrome in the trapezius muscle.

**Methods:** The research used a quasi-experiment involving two groups. This research involved Laweyan batik craftsmen using a sample of 30 respondents. then divided into two groups and given myofascial release for 90 seconds and 300 seconds. Each subject experienced 25 treatment sessions, each carried out 5 times a week for 5 weeks. The evaluation carried out includes pre and post using the Neck Disability Index (NDI).

**Result:** The research results of a p-value of 0.027 using the Mann-Whitney test indicate that myofascial release for 90 seconds and 300 seconds is significantly different in reducing myofascial pain syndrome after the upper trapezius muscle.

**Conclusion:** Based on the research results, the myofascial release given to both groups had an influence on myofascial pain syndrome. Giving myofascial release for 300 seconds has better results.

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#### CONTACT

\*Arif Pristianto

[arif.pristianto@ums.ac.id](mailto:arif.pristianto@ums.ac.id)

Physiotherapy Departement of  
Universitas Muhammadiyah Surakarta,  
Surakarta, Indonesia

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## INTRODUCTION

An employee of a writing batik craftsman, takes a long time to design, so he often experiences pain in the neck and shoulders because the position of the hands is down, and the elbows are not supported. This is because the neck muscles hold shoulders and fatigue faster due to excessive workload. Work with a posture that is not ergonomic is carried out prolonged, along with repetitive movements (Firnadi *et al.*, 2022). Sitting posture affects the occurrence of neck pain, due to pressure experienced Intervertebral disc twice as large when sitting than standing (Kwon *et al.*, 2018). Neck pain can be caused by risk factors such as work postures that are not ergonomic, involve repetitive movements and unnatural work positions (Firnadi *et al.*, 2022).

Neck is a 1<sup>st</sup> degree lever with a position to keep the head upright, where the lever is the skull. Atlanto-occipital joint as fulcrum (axis), muscle contractions extensor neck To maintain the position of the head upright is a force or effort (E), and its resistance or weight (W) is the gravity of the anterior part of the head (Pristianto & Perdana, 2023). Muscle function Trapezius The top is to maintain the position of the head which is attached right to the upper back. When performing activities, this muscle performs elevation movements and depression of the scapula bone (Prihantara *et al.*, 2015).

The most common problem in Indonesian society is neck pain, especially among workers who work with a static neck posture. This wrong posture can cause musculoskeletal disorders, one of which is pain in the neck caused by mechanical factors. The most common neck pain experienced by people is mechanical neck discomfort localized to the neck occipital region or base of the skull, and the back of the shoulder, without propagating to the upper limbs. Symptoms involve pain and stiffness in the neck area, accompanied by pain in the neck muscles that can reach the level of headaches and migraines. This results in discomfort, decreased quality of life and reduced work activities that can be performed by individuals (Haryatno & Kuntono, 2016).

Changes in the equilibrium mechanism are known as forward head posture. It is a type of postural disorder and is described as the head to anterior position. Continuous use of certain body parts will cause dysfunction or injury to the muscles, tendons, structures and ligaments of the spine cervical and lumbar, thus worsening postural deformity (Wijianto *et al.*, 2019). Mechanical changes relating to Head Control Postural, the body tries to adjust to the changes that occur by changing the balance mechanism (Lee, 2016). Upper trapezius is one muscle part of the lining Superficials back muscles, muscle work upper trapezius Pressure due to poor posture (head forward position), poor ergonomics, trauma and muscle degeneration and Fascia (Talati *et al.*, 2018).

Myofascial Pain Syndrome (MPS) is a condition in which pain arises in the muscles Trapezius the upper part characterized by pain Trigger Point (Sunyiwara *et al.*, 2019). Myofascial Pain Syndrome (MPS) in Upper Trapezius often occurs in the general public. The number of neck pain cases in Indonesia in 2021 in one month reached 10% and 40% within one year (Sunyiwara *et al.*, 2019). Women suffer from pain syndrome more often myofascial (MPS) compared to men (Kaprail *et al.*, 2019).

Musculoskeletal pain in the neck is a modern health problem, with 70% of people having experienced neck pain. A study showed that for one year, 40% of people experience musculoskeletal pain in the neck, and this is more common in women (Sunyiwara *et al.*, 2019). Myofascial Release namely manual massage techniques with the aim of relaxing fascia, reducing tissue attachment and improving the arrangement of soft tissues to relieve pain and restore movement function (Maruli *et al.*, 2014). Based on research Hidayati & Wardana (2023), the results show that Use Myofascial Release Effect to relieve pain in syndrome myofascial muscle upper trapezius. Movement friction at Myofascial Release effectively

eliminate Trigger Point, so that muscle fibers can move normally, increase blood flow through tissues and decrease nerve and muscle sensitivity (Kaprail *et al.*, 2019).

Myofascial Release (MFR) is an approach method that aims to overcome musculoskeletal problems. This technique is done by applying gentle pressure, relaxing stretching, and continuous, by applying mechanical loads, the main goal is to reduce pain, improve body function and relax tissues so that pressure on tissue structures that are prone to pain can be reduced (Pristianto & Sudawan, 2021).

Based on previous research related to MFR, short-duration administration is effective in pain complaints and improves neck function Sulistyaningsih & Putri (2020). But in research from Johansson (2014), MFR administration is given in a long duration of 300 seconds which will get recovery of muscle strength is better and there is an increase Range of Motion (ROM) on hand. Against MPS conditions in batik makers, researchers aim to prove which is more effective between short duration MFR (90 seconds) and long duration (300 seconds).

## METHODS AND MATERIALS

The method used is a quasi-experimental two design pretest and posttest group to determine the effectiveness of 90 seconds myofascial release and 300 seconds myofascial release in reducing upper trapezius myofascial pain syndrome which contributes to improved neck function. In this study, there were 2 groups involved, group 1 received 90-second myofascial release therapy and group 2 received 300-second myofascial release. Myofascial release is administered manually using the hands and fingers. The medium used is a lubricant such as baby oil. Before being given treatment, each group was measured by functional ability with the Neck Disability Index (NDI). The Neck Disability Index (NDI) has been shown to have good psychometric properties (valid, reliable, and responsive) especially used in conservative medical management in neck pain patients. Thorp & Willson *et al.* (2019) say that reliability is moderate for Neck Disability Index (NDI) retest ability (ICC: 0.64; 95% Confidence Interval (CI): 0.19 to 0.84). Samples were taken by nonrandom sampling technique with purposive sampling method. The sample size is 30 people, the population in this sample is batik craftsmen who work in Kauman Batik Village and Laweyan Batik Village, with the following inclusion criteria (1) respondents are batik employees, (2) respondents with working hours of 6-8 hours per day, (3) experience pain or complaints in the neck. While the criteria for exclusion are as follows: (1) there is an injury to the neck area, (2) there is a burn in the neck area, (3) there is pain radiating from the cervical area to the arm. The drop-out criteria were as follows (1) not attending therapy for 3 consecutive days, (2) respondents withdrew from the study. This research was approved by the Ethics Committee of RST dr. Soedjono Magelang on November 18, 2023 with number 560/EC/X/2023.

## RESULTS AND DISCUSSION

Data collection on the characteristics of research samples is the beginning of the implementation of this study. Data obtained through Neck Disability Index (NDI) in the first evaluation before intervening on a sample of respondents who meet the inclusion and exclusion criteria. 100% of the allocated respondents successfully followed the entire research process. The results can be seen below.

Table 1. Characteristics of Respondent Data

No	Characteristics of Respondent Data	Sum	
		n	%
1	<b>Gender</b>		
	Man	13	43%
	Woman	17	57%
2	<b>Age (years)</b>		
	≤ 40	10	33%
	41 – 50	6	20%
	>50	14	47%
3	<b>Employment Period (±)</b>		
	≤ 10	18	60%
	11 – 20	6	20%
	21 – 30	3	10%
	31 – 40	2	7 %
	>40	1	3%
4	<b>Duration of Work</b>		
	7 hours per day	6	20%
	>7 hours per day	24	80%
5	<b>Pre test NDI</b>		
	Keep	24	80%
	Heavy	6	20%
	<b>NDI test post</b>		
	Light	24	80%
	Keep	6	20%

The characteristics of respondents can be seen in table 1 which contains data related to personal data and about work. Such characteristics contain gender, age, length of service, duration of work, interpretation of NDI. In the study, the subjects were female about 57%. This is as per research (Kapraail *et al.* (2019) which mentions Myofascial Pain Syndrome (MPS) often occurs in women than in men. Gender affects the incidence of neck pain because the work is relatively more complex. Age over 35 years (60,7%) More are experiencing neck pain so that it is in accordance with the research Kazeminasab *et al.*(2022) Where the age group of 35-49 years has a higher risk of occurrence neck pain. This risk arises because the length of work of batik craftsmen. They enter the age where there is a change in the ability of the body's resistance to decrease. Working in this position for a long period of time can cause bad posture (Desai & Jeswani, 2018).

Table 2. Data Normality Test

	Shapiro-Wilk <sup>a</sup>		
	Statistics	Df	Sig.
Pre MFR	.895	30	.006
Post MFR	.843	30	.000

Table 2 data shows abnormal distribution pre myofascial release and post myofascial release data (sig 2 tailed <0.05).

Table 3. Wilcoxon test

MFR	Wilcoxon test		
	Z	P value	Meaning
Posttest 90-second MRF Pretest	-3.450	0,001	There is influence
Posttest 300-second MRF Pretest	-3.322	0,001	There is influence

Table 3 data is an analytical test Wilcoxon test at Myofascial Release 90 seconds and Myofascial Release 300 seconds, value ( $p = 0.001$ ) or  $p < 0.05$ .

### The Effect of 90-Second Myofascial Release on Reducing Myofascial Pain Syndrome in the Upper Trapezius Muscle

The results of the study with Wilcoxon test at Myofascial Release 90 seconds value ( $p = 0.001$ ) or  $p < 0.05$ . This indicates that there is a decreased effect of pain in batik workers. Based on statistical tests shows that there is an impact of giving Myofascial Release for 90 seconds towards pain syndrome reduction myofascial in muscles upper trapezius on the batik craftsmen wrote Laweyan. In one of the respondents there was an increase in functional ability measured using the NDI questionnaire from pre obtained 30% to post 13%. As explained by Roylonce *et al.* (2013), release myofascial Continuous entry into the muscle can stimulate Golgi tendon organs (GTO), so that the muscles become more relaxed and flexible, so as to increase the range of motion of the joints. This effect occurs due to release techniques myofascial which aims to stretch or lengthen fascial structures to restore the lubricating properties of tissues, stimulate dilation of blood vessels in circulation and move tissues and restore joint function to normal. The gradual lengthening of muscle fibres will cause decreased adhesion between muscle fibres and fascia. This therapeutic effect causes muscle fibres to return to elasticity and contract lengthwise and shorten easily so that muscle pain can be reduced. stimulates afferent nerve impulses that enter the dorsal roots of the spine meet inhibitory motor neurons and stop at the afferent motor neurons, impulses that prevent them from working by releasing tissue that has adhesions, so that blood circulation in the area becomes a continuous contraction to relax the agonist's muscles (Anwar *et al.*, 2023). While other studies found that giving myofascial release eor 90-120 seconds 5 times per week for one week effectively reduce pain and increase fungsional range of motion in the neck (Sulistyaningsih & Putri, 2020).

### The Effect of 300-Second Myofascial Release on Reducing Myofascial Pain Syndrome in the Upper Trapezius Muscle

The results of the pre and post measurement test of 300-second myofascial release using Wilcoxon test obtained a p value of 0.001 which significantly showed the effect of 300-second myofascial release on the reduction of myofascial pain syndrome in the upper trapezius muscle in batik craftsmen Laweyan. mrs. N there was an increase in functional ability measured using the NDI questionnaire from pre-obtained 44% to post 17%. In accordance with research conducted by Johansson (2014), the application of myofascial release 300 seconds can increase the area of motion of the hand joints of ski athletes. This increase is due to the trixothropy effect resulting from pressure stimulation in the given area, where the pressure exerted will increase fascial temperature, damage the adhesion of fibrous tissue between fascial layers, and restore soft tissue elasticity (Daskalaki *et al.*, 2020).



Table 4. Mann-Whitney Effect Difference Test

Result	n	Mann-Whitney		
		Mean	<i>p-value</i>	Information
MFR 90 seconds	15	12.00	0,027	$P < 0.05$
MFR 300 seconds	15	19.00		

Table 4 data is a Mann Whitney test that gets a result of 0.027 meaning  $P < 0.05$ , meaning that there is a difference in influence between giving MRF 90 seconds and MRF 300 seconds.

### The Difference in the Effect of Giving Myofascial Release 90 Seconds with Myofascial Release 300 Seconds on Reducing Myofascial Pain Syndrome in the Upper Trapezius Muscle in Laweyan Batik Craftsmen

The results of the study with the mann whitney test  $p = 0.027$ . The results showed that there was a difference in influence between giving a 90-second myofascial release with giving a 300-second myofascial release to Laweyan batik craftsmen. A 300- second myofacial release is more effective at improving functional flexibility than a 90- second myofascial release. This is due to the triothropy effect, where fascial temperature increases due to continuous pressure this occurs at 90 seconds myofascial release and 300 seconds myofascial release which results in damage to fibrous tissue connections between fascia and restores soft tissue elasticity (Macdonald *et al.*, 2012). Myofascial release is a technique that is applied by pressing manually with a combination of stretching the affected muscles to stretch the tissue bundles that are experiencing adhesions (Buana, 2017). The myofascial movement itself is a massage movement combined with pressing and stretching which aims to stretch or stretch the fascia structure to release adhesions which will reduce pain and restore the lubricating quality of the fascia tissue (Putri, 2019).

Meanwhile, according to Cao *et al.* (2014), states that ectocytosis occurs during a 300-second myofascial release. This process causes fibroblasts to turn into mifibroblasts, which causes cellular changes in the extracellular matrix, which in turn reduces the length of the matrix. Keratin and fibroblasts are associated which determine the shape of tension and tissue structure. Other research conducted by Ajimsha *et al.* (2014), said that myofascial release has an impact on increasing Range of Motion (ROM), increasing joint biomechanics, increasing soft tissue extensibility and significantly decreasing pain and muscle tone. In myofascial release, friction movements are given consistently in the direction of muscle fibers so that the trigger point disappears. This causes muscle fibers to move normally, and improves blood flow to tissues, and reduces muscle and nerve sensibility (Kaprail *et al.*, 2019). The weakness of this study is because it is uncertain how much depth of pressure is given from myofascial release interventions given by researchers to respondents.

## CONCLUSIONS

The results concluded that the myofascial release given to both groups had an influence on myofascial pain syndrome. Giving myofascial release for 300 seconds has better. In addition, myofascial release for 90 seconds and 300 seconds significantly reduced myofascial pain in the upper trapezius after the fifth week of treatment. However, giving MFR treatment for a longer duration has a better effect on the soft tissue that is experiencing problems. The functional impairment of Laweyan batik artisans was measured using the NDI questionnaire, and improvement in functional ability was observed based on the NDI questionnaire based on the calculation of pain reduction scores before and after treatment. Laweyan batik craftsmen experienced a decrease in pain. This study is able to provide insight and knowledge about good work posture for Laweyan batik craftsmen. For physiotherapists, the recommendations of this study can be used as an important reference in carrying out myofascial release interventions aimed at reducing pain in the upper trapezius muscle. For further research development, it is necessary to conduct a meta-analysis related to pressure in providing myofascial release.

## REFERENCES

- Anwar, S., Leksonowati, S. S., Ahmad, H., & Arpandjaman, A. (2023). Muscle Energy Technique Efektif pada Pasien Nyeri Musculus Upper Travezius. *INSOLOGI: Jurnal Sains dan Teknologi*, 2(1), 128-135. <https://doi.org/10.55123/insologi.v2i1.1454>
- Buana, N. M. I. T., Purnawati, S., Satriyasa, K., Sandi, N., & Imron, M. A. (2017). Perbedaan Kombinasi Myofascial Release Technique dengan Ultrasound dan Kombinasi Ischemic Compression Technique dengan Ultrasound dalam Meningkatkan Kekuatan Otot Leher Akibat Sindroma Miofasial pada Penjahit Pakaian di Kabupaten Gianyar. *Sport and Fitness Journal*, 5(3). <https://doi.org/10.24843/spj.2017.v05.i03.p10>
- Daskalaki, K., Pafis, G., Gioftsidou, A., Beneka, A., Bebetos, E., & Malliou, P. (2020). Investigation of the Effects of Leg Dominance on Cross-Transfer of Flexibility after a Unilateral Treatment with Foam Roller - A Pilot Study. *International Journal of Human Movement and Sports Sciences*, 8(3), 79-85. 10.13189/saj.2020.080301
- Firnadi, J. A. H., Handayani, S., Munawaroh, S., & Wiyono, N. (2022). Hubungan Postur Kerja dengan Kejadian Nyeri Leher pada Pembatik di Kampung Batik Laweyan Surakarta. *National Journal of Occupational Health and Safety*, 2(2). <https://doi.org/10.59230/njohs.v2i2.5627>
- Haryatno, P., & Kuntono, H. P. (2016). Pengaruh Pemberian Tens Dan Myofascial Release Terhadap Penurunan Nyeri Leher Mekanik. *Interest : Jurnal Ilmu Kesehatan*, 5(2), 182–188. <https://doi.org/10.37341/interest.v5i2.52>
- Hidayati, N. P., & Wardana, A. P. (2023). Myofascial Pain Syndrome of the Upper Trapezius Muscle: Different Effects of Myofascial Release and Stretching on Pain. *Jurnal Keperawatan Dan Fisioterapi (Jkf)*, 5(2), 287–294. <https://doi.org/10.35451/jkf.v5i2.1576>
- Johansson, P. (2014). Effects of Self Myofascial Release on Grip Strength Recovery. *Thesis*, 1–21. <https://api.semanticscholar.org/CorpusID:141329619>
- Kaprail, M., Jetly, S., Sarin, A., & Kaur, P. (2019). To Study the Effect of Myofascial Trigger Point Release in Upper Trapezius Muscle Causing Neck Disability in Patients with Chronic Periarthritis Shoulder. *Sports and Exercise Medicine*, 5(1), 1–4. <https://doi.org/10.17140/SEMOJ-5-167>
- Kirnantoro, & Maryana. (2019). *Anatomi Fisiologi* (P.B. Press). <http://dx.doi.org/10.1016/j.jbmt.2009.12.002>
- Kwon, Y., Kim, J. W., Heo, J. H., Jeon, H. M., Choi, E. B., & Eom, G. M. (2018). The Effect of Sitting Posture on the Loads at Cervico-thoracic and Lumbosacral Joints. *Technology and Health Care*, 26(S1), S409–S418. <https://doi.org/10.3233/THC-174717>
- Lee, J. H. (2016). Effects of forward head Posture on Static and Dynamic Balance Control. *Journal of Physical Therapy Science*, 28(1), 274–277. <https://doi.org/10.1589/jpts.28.274>
- Maruli, W. O., Sutjana, I. D., & Indrayani, A. W. (2014). Perbandingan Myofascial Release Technique Dengan Contract Relax Stretching Terhadap Penurunan Nyeri Pada Sindrom Myofascial Otot Upper Trapezius. *Majalah Ilmiah Fisioterapi Indonesia*, 2(3), 3. <https://doi.org/10.24843/MIFI.2014.v02.i03.p01>
- Oatis, C. A. (2017). Kinesiology: The Mechanics and Pathomechanics of Human Movement. In *Medicine & Science in Sports & Exercise* (3rd ed.). <https://doi.org/10.1097/00005768-200403000-00028>.
- Prihantara, I. M. D., Winaya, I. M. N., & Muliarta, I. M. (2015). Kombinasi Strain Counterstrain Dan Infrared Sama Baik dengan Kombinasi Contract Relax Stretching dan Infrared Terhadap Penurunan Nyeri Myofascial Pain Syndrome Otot Upper Trapezius Pada Mahasiswa Fisioterapi Fakultas Kedokteran Universitas Udayana. *Majalah Ilmiah Fisioterapi Indonesia*, 3(1), 2015. <https://doi.org/10.24843/MIFI.2015.v03.i01.p02>
- Pristianto, A., & Sudawan, E. A. (2021). Efektivitas Dosis Pemberian Myofascial Release Terhadap Fleksibilitas Otot. *Jurnal Kesehatan*, 14(2), 126–131.



<https://doi.org/10.23917/jk.v14i2.12716>

- Pristianto, A., & Perdana, S. S. (2023). *Biomekanik Klinis*. MUP: Surakarta.
- Sulistyaningsih, S., & Putri, A. R. H. (2020). Myofascial Release Menurunkan Nyeri dan Meningkatkan Fungsional Leher Myofascial Pain Syndrome Otot Upper Trapezius. *Jurnal Keterapian Fisik*, 5(2), 122–131. <https://doi.org/10.37341/jkf.v5i2.231>
- Sunywara, A. S., Putri, M. W., & Sabita, R. (2019). Pengaruh Myofascial Release Kombinasi dengan Hold Relax terhadap Myofascial Pain Syndrome. *Jurnal Ilmiah Kesehatan*, 12(2). <https://doi.org/10.48144/jiks.v12i2.173>
- Talati, D., Varadhranjulu, G., & Malwade, M. (2018). The effect of forward head posture on spinal curvatures in healthy subjects. *Asian Pacific Journal of Health Sciences*, 5(1), 60-63. <https://doi.org/10.21276/apjhs.2018.5.1.13>
- Thorp, J., & Willson, J. (2019). The Neck Disability Index is Not Correlated with Some Parameters of Temporomandibular Disorders: A Cross-Sectional Study. *Journal of Oral & Facial Pain and Headache*, 33(1), 39–46. <https://doi.org/10.11607/ofph.1992>
- Wijianto, W., Dewangga, M. W., & Batubara, N. (2019). Resiko Terjadinya Gangguan Keseimbangan Dinamis dengan Kondisi Forward Head Posture (FHP) pada Pegawai Solopos. *Gaster*, 17(2), 217. <https://doi.org/10.30787/gaster.v17i2.427>
- Wulan, W. O., Yani, F., & Setiawan, D. (2024). Differences in the Effects of Neck Calliet Exercise and Myofascial Release on Reducing Pain in Muscle Neck Pain Sufferers. *FISIO MU: Physiotherapy Evidences*, 5(1), 69-77. <https://10.23917/fisiomu.v5i1.2771>