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Original Article

Myofascial release therapy in patients with cervical myofascial pain syndrome: A randomized-controlled trial

Mustafa Çağrı Öcalan[1], Saime Ay[2], Elzem Bolkan Günaydın[3]

[1]Department of Physical Medicine and Rehabilitation, Mamak State Hospital, Ankara, Türkiye
[2]Department of Physical Medicine and Rehabilitation, Lokman Hekim University Faculty of Medicine, Ankara, Türkiye
[3]Department of Physical Medicine and Rehabilitation, Ufuk University Faculty of Medicine, Ankara, Türkiye

ABSTRACT

Objectives: This study aims to investigate the effects of myofascial release therapy (MRT) added to standard physical therapy and rehabilitation practices on neck pain, trigger point (TP) numbers, pressure pain threshold (PPT), cervical joint range of motion (ROM), neck disability and quality of life in patients with cervical myofascial pain syndrome (MPS).

Patients and methods: This prospective, randomized-controlled trial included a total of 60 patients (8 males, 52 females; mean age: 41.6±12.5 years; range, 20 to 65 years) aged between 18 and 65 years who reported neck pain persisting for over one month and satisfied the Travell and Simons criteria for MPS diagnosis between December 2021 and September 2022. The patients in Group 1 (n=30) underwent a standard physical therapy program. Patients in Group 2 (n=30) additionally underwent MRT three days a week. Before and on Day 15 after treatment, patients' pain was evaluated by Visual Analog Scale (VAS), TP numbers by palpation, PPTs by pressure algometer, cervical ROM by goniometer, disability by Neck Disability Index (NDI), quality of life by Nottingham Health Profile (NHP).

Results: The VAS scores, TP numbers, PPTs, cervical ROM values, NDI, and NHP scores exhibited a significant improvement posttreatment compared to pretreatment in both groups ($p<0.001$). Considering the changes after treatment, in Group 2, the changes of VAS-movement, VAS-rest, TP numbers, PPTs, cervical ROMs, NDI, NHP scores were significantly higher than Group 1 ($p\leq0.05$ for all).

Conclusion: In patients with neck pain due to cervical MPS, MRT provides positive effects on pain, TP numbers, PPT measurements, cervical ROM, neck disability, and quality of life. The MRT appears to be an effective treatment for cervical MPS as it is non-invasive, easy to apply, inexpensive, and has a low side effect profile.

Keywords: Fascia, myofascial pain syndrome, myofascial release therapy, neck pain.

In the management of myofascial pain syndrome (MPS), various interventions such as local anesthetic injections, botulinum toxin injections, ozone injections, radiofrequency ablation, dry needling, acupuncture, and physical therapy modalities (notably magnetic stimulation, ultrasound therapy, laser therapy, extracorporeal shock wave therapy, and transcutaneous electrical nerve stimulation [TENS]) are commonly utilized. Additionally, pharmacological treatments including non-steroidal anti-inflammatory drugs, muscle relaxants, antidepressants, gabapentin, opioids, and topical agents such as lidocaine and capsaicin, alongside kinesiotaping, manual therapy, exercise, and psychotherapy, have demonstrated clinical efficacy. However, the effectiveness of numerous interventions remains unverified.[1-5] There remains a need for an evidence-based, integrated, and patient-centered approach to the treatment of MPS that is tailored to individual needs.[5]

Myofascial release therapy (MRT) is a manual therapy technique which involves gradual stretching by a therapist or the individual, acting on the muscles and surrounding fascia.[6] Its effects include increasing joint range of motion (ROM) and mobility

Corresponding author: Elzem Bolkan Günaydın, MD. Ufuk Üniversitesi Tıp Fakültesi, Fiziksel Tıp ve Rehabilitasyon Anabilim Dalı, 42090 Balgat, Ankara, Türkiye.
E-mail: elzembolkan@yahoo.com

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of soft tissues, eliminating imbalances in muscle tone, reducing muscle pain, reducing stress on joints, and increasing neuromuscular efficiency.[7] Current research frequently emphasizes singular instances or particular applications, resulting in a considerable deficiency in comprehending its comprehensive therapeutic potential.[8] We consider it essential to assess the efficacy of MRT in cervical myofascial pain, as it is a therapeutic approach that directly treats the underlying cause, specifically the fascia. Research indicating its efficacy suggests that MRT may be integrated into clinical practice as a non-invasive, readily applicable, low-risk, and focused therapeutic option. Nonetheless, the literature contains a restricted number of trials assessing the efficacy of MRT in individuals with cervical MPS.

In the present study, we hypothesized that the incorporation of MRT treatment combined with regular physical therapy and rehabilitation might provide superior improvements in disease-related outcome measures for patients suffering from cervical myofascial neck pain. We, therefore, aimed to examine the impact of MRT in conjunction with normal physical therapy and rehabilitation on neck pain, trigger point count, pressure pain threshold, cervical joint ROM, neck impairment, and quality of life in patients suffering from cervical myofascial neck pain.

PATIENTS AND METHODS

This single-center, prospective, randomized-controlled observational trial was conducted at Ufuk University Faculty of Medicine, Department of Physical Medicine and Rehabilitation between December 2021 and September 2022. Initially, a total of 73 volunteer patients aged between 18 and 65 years who reported neck pain persisting for over one month and satisfied the Travell and Simons criteria for MPS diagnosis were included.[9] Exclusion criteria were as follows: known infectious, inflammatory, tumoral, or advanced degenerative diseases that could induce neck pain; referred pain from internal organs; a history of spinal or shoulder fractures or surgeries; evidence of nerve root involvement due to cervical discopathy; and a history of neck manipulation or invasive procedures within the past three months. Written informed consent was obtained from each patient. The study protocol was approved by Ufuk University Faculty of Medicine, Ethics Committee (Date: 13.12.2021, No: 12024861-88). The study was conducted in accordance with the principles of the Declaration of Helsinki.

A total of 73 patients participating in the study were randomly allocated into two groups via block randomization using the "randomizer.org" application; one group received MRT in conjunction with the standard physical therapy program (Group 1, n=36), while the other group received only the conventional physical therapy program (Group 2, n=37). Patients in the standard physical therapy program group received a total of 15 sessions, five days a week, 15 min of superficial heat (hot pack), 15 min of TENS, 5 min of laser, 15 min of interferential current therapy, and a home-based workout program was prescribed including cervical isometric exercises, joint ROM exercises, and relaxation exercises. Alongside the physical therapy regimen, participants in the MRT group underwent MRT for 15 min, three times weekly, totalling nine sessions, administered by a qualified physiotherapist. All procedures were conducted with the patient in the supine position. The physiotherapist administered the treatment in the subsequent sequence. Finally, a total of 60 patients (8 males, 52 females; mean age: 41.6±12.5 years; range, 20 to 65 years) who met the inclusion criteria were recruited.

Sternocleidomastoid (SCM) release technique

The physiotherapist stood on the side to be treated and instructed the patient to turn the head toward that side. While guiding the head rotation, the therapist moved a fist-shaped hand around the neck toward the anterior portion of the upper trapezius. Once full rotation was achieved, the sternocleidomastoid muscle was carefully grasped with the proximal finger joints. Pressure was, then, applied toward the styloid process, located between the mastoid process and the ear, ensuring that no force was exerted beyond the muscle layer (Figure 1).[10]

Suboccipital release technique

The physiotherapist placed the middle and ring fingers on the skull base, positioning both ring fingers beneath the external occipital protuberance. The fingers were, then, moved deeply and curled toward the inferior surface of the occiput. Using the tip of the middle finger as a hook, it was positioned at the midpoint of the rectus capitis posterior major muscle, which was stabilized by applying downward pressure. The patient was, then, instructed to gently nod the head (front to back) to induce a stretch in the muscle. To reduce tension in the rectus capitis posterior minor and obliquus capitis superior muscles, the physiotherapist repositioned the occiput posteriorly over the atlas, withdrew the middle finger from the tissue, and curled the index and ring fingers toward the inferior aspect of the occiput. The occiput was, then, gradually elevated (Figure 1).[10]

Atlanto-occipital junction release technique

While in a seated position, the therapist stabilized the patient's head with the sternum at the vertex region and placed the fingertips of one hand at the atlanto-occipital transition. The occiput was gently supported with the other hand, and mild stretching was applied (Figure 2).[11]

Upper trapezius release technique

The therapist instructed the patient to deepen breathing while allowing the head to rest fully on the therapist. During the breathing cycle, stretching was applied with one hand positioned under the occiput and the other on the sternum, synchronized with the rhythm of respiration (Figure 2).[10]

Outcome parameters

The Visual Analog Scale (VAS),[12] trigger point (TP) numbers, pressure pain threshold (PPT), cervical joint ROM,[13] Neck Disability Index (NDI),[14,15] and Nottingham Health Profile (NHP)[16,17] before treatment and on Day 15 after treatment were recorded. All outcome measure assessments were made by a physiatrist blinded to which treatment group the patients were in.

Visual Analog Scale

The patients were instructed to evaluate the intensity of their neck pain at rest and during movement on Days 1 and 15 using a 10-cm scale, where the initial point (0) indicated no pain and the terminal point (10) denoted the most excruciating pain ever encountered. A greater measured value correlates with increased pain severity.[12]

Pressure pain threshold

The PPT is the minimal pressure that induces pain or discomfort in a patient, indicating sensitivity to painful stimuli. A pressure pain algometer (Commander-JTECH Medical, UT, USA)

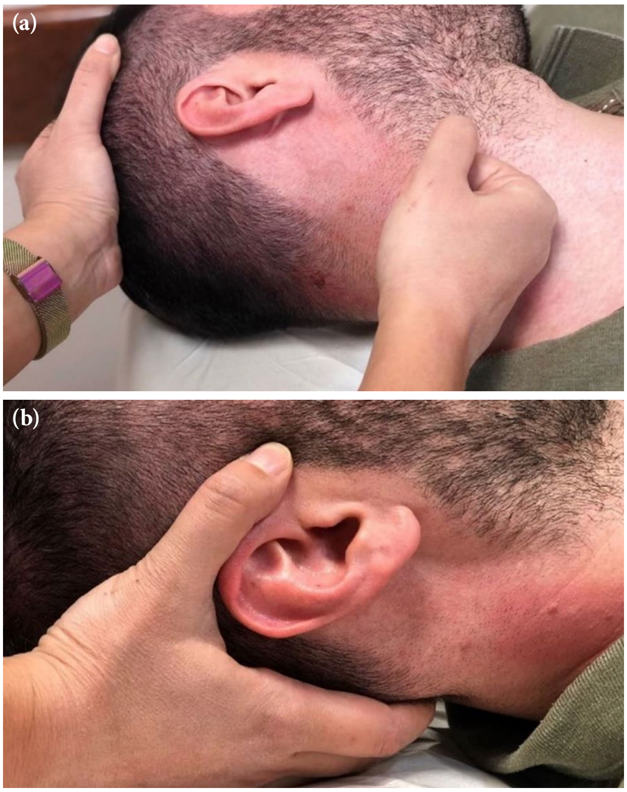

Figure 1. **(a)** Myofascial release therapy applied for sternocleidomastoid muscle and **(b)** myofascial release therapy applied for suboccipital muscles.

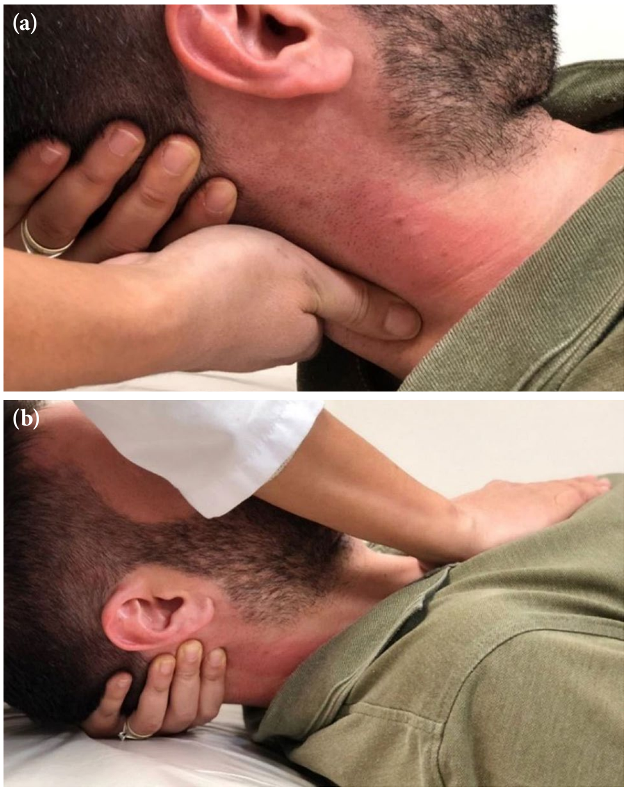

Figure 2. **(a)** Myofascial release therapy applied for the atlantooccipital junction and **(b)** myofascial release therapy for the upper trapezius muscle.

consisting of a rubber disc with a 1 cm^2 surface area connected to a force gauge was used to measure the pressure pain threshold. After explaining how to measure PPT, the patient was placed in a completely comfortable chair position. The pressure algometer's disc head was placed over the trigger point at a 90° angle. Before the procedure, the patient was asked to report the first moment of pain. Compression pressure was gradually increased, stopping at the point where the patient first felt pain, and the measurement was recorded. Three measurements were taken at the same point, and the average was calculated. Measurements were taken for all TPs, but the pain threshold measurement for the most painful TP was recorded in lb/cm^2.[13]

Neck Disability Index

The degree to which chronic neck pain affected individuals' everyday activities was evaluated using the NDI.[14] The Turkish validity and reliability were assessed by Kesiktas et al.[15] in 2012. The index evaluates subjective symptoms and daily living activities, comprising 10 sections: pain intensity, personal care, lifting, reading, headache, concentration, work, driving, sleep, and leisure activities. Each segment comprises six choices, spanning from 0 to 5. The overall score varies from 0 to 50 (0: no disability; 50: maximum disability), with elevated scores signifying increased disability.[14,15]

Nottingham health profile

This is a comprehensive health status scale that evaluates perceived physical, emotional, and social issues and their impact on everyday activities.[16] The adaption to Turkish was performed by Kücükdeveci et al.[17] The first section of the scale assesses individuals' health status, while the second section assesses the impact of their health on daily life. The first section consists of 38 items, each with a Yes or No answer. This section has six subscales: pain, emotional reactions, sleep, social isolation, physical activity, and energy. Each question within the subscale is weighted differently, and each subscale is scored from 0 to 100. The sum of all subscale scores gives the total score for the first section of the scale. The higher the score, the worse the perceived quality of life related to health status. The second part consists of seven items that question whether problems are experienced in the areas of daily life most likely to be affected by the person's health condition, such as work life, housework, social life, interpersonal relationships, sexual life, hobbies and holidays. Each item is answered with Yes or No.

Statistical analysis

Study power analysis and sample size calculation were performed using the G*Power version 3.1.9.7 software (Heinrich Heine University Düsseldorf, Düsseldorf, Germany). The effect size was identified as substantial (Cohen's d=0.80), the significance level (α) was set at 0.05, and the statistical power (1-β) was 0.80. The study performed to assess the mean difference between two independent groups determined that a minimum of 26 individuals was necessary for each group. Consequently, the total sample size was established to be no fewer than 52. The study included 73 patients, accounting for potential dropouts, with data from 60 patients, 30 from each group, utilized in the statistical analysis.

Statistical analysis was performed using the IBM SPSS version 20.0 software (IBM Corp., Armonk, NY, USA). The appropriateness of the variables for normal distribution was assessed by visual approaches and Kolmogorov-Smirnov and Shapiro-Wilk tests, while the homogeneity of variances was evaluated using the Levene test. Continuous variables were expressed in mean ± standard deviation (SD) or median (min-max), while categorical variables were expressed in number and frequency. In comparisons between dependent groups, the dependent group's t-test was used for numerical data that met parametric test conditions, and the Wilcoxon test was used for data that did not meet parametric test conditions. In comparisons between independent groups, the independent group's t-test was used for numerical data that met parametric test conditions, the Mann-Whitney U test was used for numerical data that did not meet parametric test conditions, and the chi-square test was used for categorical data. A p value of <0.05 was considered statistically significant.

RESULTS

Of a total of 73 patients, 60 who met the inclusion criteria were recruited. A total of 30 patients in Group 1 underwent a standard physical therapy program, while 30 patients in Group 2 additionally underwent MRT three days a week. The study flowchart is shown in Figure 3.

No statistically significant difference was detected between Group 1 and Group 2 regarding

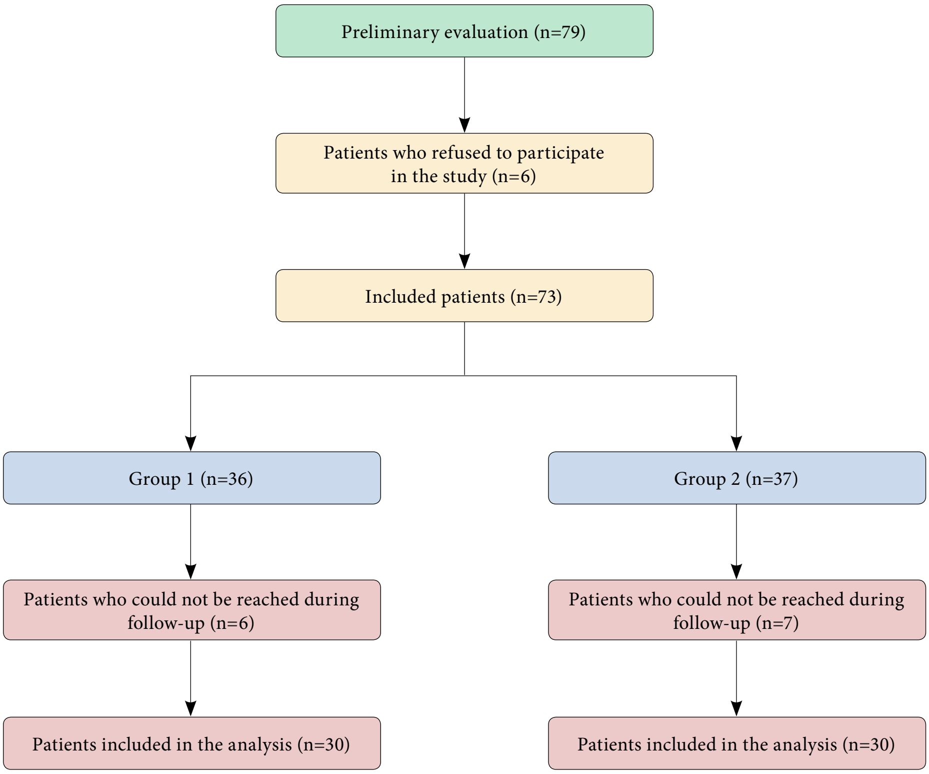

Figure 3. Work flow chart.

age, sex distribution, body mass index (BMI), prevalence of comorbidities, and duration of pain ($p>0.05$) (Table 1).

No statistically significant differences were found between the groups for VAS-movement ($p=0.10$) and VAS-rest ($p=0.19$) values during the pretreatment clinical evaluation (Table 2). The number of TP in the trapezius ($p=0.001$), SCM ($p=0.06$), and paraspinal muscles ($p=0.01$) was significantly higher in Group 1 compared to Group 2 (Table 2).

No statistically significant difference was detected between Group 1 and Group 2 regarding PPT values in the trapezius ($p=0.68$), SCM ($p=0.15$), and paraspinal muscles ($p=0.15$) (Table 2). In terms of cervical ROM evaluations, in Group 1, active flexion ROM ($p=0.009$), active extension ROM ($p=0.01$), active left lateral flexion ROM ($p=0.02$), active right

TABLE 1
Demographic and clinical data

	Group 1 (n=30)					Group 2 (n=30)					
	n	%	Mean±SD	Median	Min-Max	n	%	Mean±SD	Median	Min-Max	*p*
Age (year)			43.4±13.4		20-64			39.8±11.6		22-65	0.26
Sex											1
Female	26	86.7				26	86.7				
Male	4	13.3				4	13.3				
Body mass index (kg/m²)				25.6	18.4-38.5				24.1	19.3-44.1	0.97
Comorbidity											0.59
No	18	60				20	66.7				
Yes	12	40				10	33.3				
Pain duration (month)				24	4-60				24	6-48	0.38

SD: Standard deviation; Statistical significance level $p<0.05$.

TABLE 2
Intra-group and inter-group comparison of evaluation parameters before and after treatment

	Group 1 (n=30)			Group 2 (n=30)			
	Mean±SD	Median	Min-Max	Mean±SD	Median	Min-Max	p^1
VAS-movement (cm)							
1st day	7.8±1	8	5.4-9.2	7.3±1.4	7.6	4.5-9.2	0.10β
15th day	4.1±1	4.3	1.7-6.2	4.8±1.3	4.7	2.3-7.5	0.02*β
p^2		<0.001*			0.10β		
VAS-rest (cm)							
1st day	5.3±2.1	5.5	1.1-8.7	4.5±2.5	4.5	0-9.1	0.19β
15th day	2.4±0.9	2.4	0-3.8	2.6±1.9	2.6	0-6.7	0.89
p^2		<0.001*α			<0.001*α		
TP number-trapezius							
1st day	2.9±1.1	3	1-5	2.1±0.7	2	1-4	0.001*
15th day	1.5±0.6	1.5	1-3	1.2±0.4	1	1-2	0.03*
p^2		<0.001*			<0.001*		
TP number-SCM							
1st day	1.7±0.8	2	0-4	1.3±0.5	1	0-2	0.06*
15th day	0.8±0.5	1	0-2	0.8±0.4	1	0-1	0.80
p^2		<0.001*			<0.001*		
TP number-paraspinal							
1st day	0.8±0.7	1	0-2	0.4±0.6	0	0-2	0.01*
15th day	0.2±0.4	0	0-1	0.1±0.3	0	0-1	0.45
p^2		<0.001*			0.007*		
PPT-trapezius (lb/cm²)							
1st day	7.1±0.9	7.2	5.1-8.7	7.2±1.2	7.2	4.3-9.5	0.68β
15th day	10.8±1	11	8.7-12.2	9.9±1.5	9.8	7.1-13	0.01*
p^2		<0.001*α			<0.001*		
PPT-SCM (lb/cm)							
1st day	5.3±1	5.4	3.7-7.2	5.5±1.5	5.7	0-7.2	0.15
15th day	7.9±1	8.2	5.7-9.4	7±2.5	7.6	0-9.7	0.12
p^2		<0.001*			0.001*		
PPT-paraspinal (lb/cm²)							
1st day	2.4±2.1	3.5	0-5.2	1.6±2.1	0	0-5.6	0.15
15th day	4.4±3.7	6.5	0-8.8	1.7±2.9	0	0-7.1	0.001*
p^2		<0.001*			0.97		
Active flexion ROM (°)							
1st day	32±4.3	30	25-40	36±5.9	35	30-50	0.009*
15th day	39.5±3	40	35-45	42.5±7.3	45	30-50	0.11
p^2		<0.001*			<0.001*		
Active extension ROM (°)							
1st day	34.8±4.6	35	30-40	39.3±7.8	40	25-50	0.01*
15th day	43.3±4.1	45	35-54	44.3±6.5	45	30.50	0.21
p^2		<0.001*			<0.001*		
Active right lateral flexion ROM (°)							
1st day	32.8±4.5	30	25-40	35.7±6	37.5	25-45	0.052
15th day	39.2±3.7	40	30-45	41.3±4.3	42.5	30-45	0.03*
p^2		<0.001*			<0.001*		

TABLE 2
Continued

	Group 1 (n=30)			Group 2 (n=30)			
	Mean±SD	Median	Min-Max	Mean±SD	Median	Min-Max	p^1
Active left lateral flexion ROM (°)							
1st day	32.8±4.7	30	25-40	36±5.5	35	25-45	0.02*
15th day	39.5±3.8	40	30-45	41.7±3.8	40	30-45	0.02*
p^2		<0.001*			<0.001*		
Active right rotation ROM (°)							
1st day	61.5±5.4	60	50-70	68.7±6.1	70	60-80	<0.001*
15th day	72±3.4	70	65-80	74.7±4.3	75	65-85	0.001*
p^2		<0.001*			<0.001*		
Active left rotation ROM (°)							
1st day	61.5±5.3	62.5	50-70	69±6.1	70	60-80	<0.001*
15th day	72.5±3.1	72.5	65-80	75.3±4.1	75	65-85	0.004*
p^2		<0.001*			<0.001*		
Passive flexion ROM (°)							
1st day	36.3±3.7	35	30-45	38.2±6.2	37.5	30-50	0.31
15th day	43.3±2.4	45	40-45	44.2±5.9	45	35-50	0.24
p^2		<0.001*			<0.001*		
Passive extension ROM (°)							
1st day	40±3.9	40	30-45	42±7	40	30-50	0.21
15th day	46.3±3.7	45	35-50	46.3±4.3	47.5	35-50	0.81
p^2		<0.001*			<0.001*		
Passive right lateral flexion ROM (°)							
1st day	38.8±3.6	40	30-45	39.5±4.6	40	30-45	0.38
15th day	43.2±2.8	45	35-45	43.7±2.2	45	40-45	0.53
p^2		<0.001*			<0.001*		
Passive left lateral flexion ROM (°)							
1st day	38±4.8	40	25-45	39.8±4.6	40	30-45	0.12
15th day	43.3±2.7	45	35-45	44±2	45	40-45	0.34
p^2		<0.001*			<0.001*		
Passive right rotation ROM (°)							
1st day	67±4.7	70	55-75	73.2±6.6	75	60-90	<0.001*
15th day	77.2±3.1	77.5	70-80	77.5±4.9	80	65-90	0.66
p^2		<0.001*			<0.001*		
Passive left rotation ROM (°)							
1st day	67.7±5	70	55-80	73.8±6.2	75	60-90	<0.001*
15th day	77.8±2.8	80	70-80	78±4.1	80	70-90	0.97
p^2		<0.001*			<0.001*		
NDI score							
1st day	20.1±5.8	20	8-38	17.1±8	15.5	7-46	0.02*
15th day	9.5±2.7	9	5-14	9.6±3.6	10	3-18	0.96
p^2		<0.001*			<0.001*		
NHP-pain score							
1st day	56.3±13.3	57.1	33.1-80.3	51.1±22.5	51	10.5-100	0.14
15th day	26.6±8.3	22.9	10-43.1	55.7±94	31.9	10-398.1	0.10
p^2		<0.001*α			0.001*		

TABLE 2
Continued

	Group 1 (n=30)			Group 2 (n=30)			
	Mean±SD	Median	Min-Max	Mean±SD	Median	Min-Max	p^1
NHP-emotion score							
1st day	41.4±15.1	36.2	16.8-68.3	37.7±22.2	39.9	0-76.5	0.46β
15th day	25±12	22.6	7.1-46.2	30.6±22.2	33	0-76.5	0.31
p^2		<0.001*α			0.001*		
NHP-sleep score							
1st day	49.4±24.4	55.9	0-100	37.2±33.9	39.8	0-100	0.07
15th day	29.2±15.8	27.3	0-65.7	24.4±26.3	14.3	0-77.6	0.12
p^2		<0.001*			0.007*		
NHP-social score							
1st day	24.6±23.7	19.4	0-77.5	24.8±28	19.4	0-77.5	0.81
15th day	21.3±23.4	19.4	0-77.5	22.9±26.8	19.4	0-77.5	0.97
p^2		0.04*			0.46		
NHP-physical activity score							
1st day	39.7±9.3	43.2	20-54.6	40±12.8	43.3	12.6-65.7	0.89
15th day	20.8±7.7	20.5	9.3-34.6	22.7±8.2	20.1	0-41.9	0.86
p^2		<0.001*			<0.001*		
NHP-energy score							
1st day	44.3±33.1	50	0-100	44.7±40.8	24	0-100	0.84
15th day	27.8±28	24	0-100	26.1±31[24	0-100		0.72
p^2		0.001*			0.001*		
NHP-part 1 total score							
1st day	253.9±100.9	241.1	111.1-469	235.5±133	209.1	67-472.5	0.55β
15th day	150.8±81	121.5	52.2-321.9	158±100	131.9	31.1-384.6	0.97
p^2		<0.001*α			<0.001*		
NHP-part 2 total score							
1st day	3.7±1.2	4	2-6	3.9±1.3	4	2-6	0.73
15th day	1.8±0.7	2	1-3	2.2±0.8	2	1-4	0.06
p^2		<0.001*			<0.001*		

SD: Standard deviation; VAS: Visual Analog Scale; TP: Trigger point; SCM: Sternocleidomastoideus; PPT: Pressure pain threshold; ROM: Range of motion; NDI: Neck disability index; NHP: Nottingham health profile; p^1: P value for comparison between groups; p^2: P value for intragroup comparison; * Statistical significance level p<0.05; α Paired T test was used; β Student t test was used.

rotation ROM (p<0.001), active left rotation ROM (p<0.001), passive right rotation ROM (p<0.001) and passive left rotation ROM (p<0.001) values were significantly lower than Group 2. No statistically significant difference was detected between the groups regarding other cervical ROM assessments prior to treatment (p>0.05) (Table 2). The NDI score in Group 1 significantly increased compared to Group 2 (p=0.02) (Table 2).

No statistically significant difference was detected between Group 1 and Group 2 regarding NHP scores (p>0.05 for all comparisons) (Table 2).

Considering posttreatment clinical evaluation parameters within the group, VAS-movement and VAS-rest values after treatment were significantly lower than the pretreatment values in both Group 1 and Group 2 (p<0.001 for both VAS-movement and VAS-rest measurements in both groups) (Table 2).

In both groups, the number of TPs in the trapezius, SCM, and paraspinal muscles was observed to be significantly lower after treatment compared to pretreatment values (p<0.001 for all muscles in Group 1; p=0.007 for paraspinal muscle in Group 2, p<0.001 for SCM and trapezius) (Table 2).

In Group 1, the PPT values in the trapezius, SCM, and paraspinal muscles were statistically significantly higher after the treatment compared to the pretreatment values ($p<0.001$ for all muscles. In Group 2, the posttreatment PPT values in the trapezius ($p<0.001$) and SCM ($p=0.001$) muscles significantly increased compared to pretreatment values, whereas no statistically significant difference was noted in the PPT values of the paraspinal muscles between pretreatment and posttreatment ($p=0.97$) (Table 2).

In both groups, all posttreatment cervical ROM values considerably increased compared to pretreatment values ($p<0.001$ for all ROM values in Group 1 and Group 2) (Table 2).

In both groups, posttreatment NDI scores were observed to be lower compared to pretreatment scores ($p<0.001$ for both groups) (Table 2).

All NHP scores in Group 1 were significantly reduced posttreatment compared to pretreatment ($p=0.04$ for NHP social score, $p=0.001$ for NHP energy score, $p<0.001$ for all other NHP values). Although there was no statistically significant difference in Group 2 NHP-social score pre- and posttreatment ($p=0.46$), all other NHP scores exhibited significant reductions following treatment ($p=0.001$ for NHP-pain, emotional, and energy scores; $p=0.007$ for NHP-sleep score; $p<0.001$ for NHP-physical activity score, NHP Part 1 total score, and NHP Part 2 total score) (Table 2).

Considering the posttreatment clinical evaluation parameters, the VAS-movement value was significantly higher in Group 2 compared to Group 1 ($p=0.02$), while there was no statistically significant difference between the groups in terms of VAS-rest value ($p=0.89$) (Table 2).

The total numbers of TPs in the trapezius muscle were considerably greater ($p=0.03$) in Group 1 than in Group 2; however, no statistically significant differences were noted in the number of TPs in the SCM ($p=0.80$) and paraspinal muscles ($p=0.45$) (Table 2).

The PPT values in the trapezius ($p=0.01$) and paraspinal muscles ($p=0.001$) considerably increased in Group 1 compared to Group 2; however, no statistically significant difference was found between the groups for PPT values in the SCM muscle ($p=0.12$) (Table 2).

In the cervical ROM examinations, Group 1 exhibited substantially higher values for active right lateral flexion ROM ($p=0.03$), active left lateral flexion ROM ($p=0.02$), active right rotation ROM ($p=0.001$), and active left rotation ROM ($p=0.004$) compared to Group 2. No statistically significant difference was observed between the groups in terms of other cervical ROM evaluations after treatment ($p>0.05$) (Table 2).

No statistically significant difference was observed between the groups in terms of NDI scores ($p=0.96$) (Table 2).

No statistically significant difference was noted between the groups regarding NHP scores ($p>0.05$ for all) (Table 2).

Upon comparing the alterations in evaluation parameters posttreatment to pretreatment between Group 1 and Group 2, the changes in VAS-movement ($p<0.001$) and VAS-rest ($p=0.007$) values were significantly greater in Group 1 than in Group 2 (Table 3).

While the alterations in the number of TPs in the trapezius ($p=0.008$) and paraspinal muscles ($p=0.02$) posttreatment were significantly greater in Group 1 compared to Group 2, no statistically significant difference was noted between the groups regarding the change in the number of TPs in the SCM ($p=0.054$) (Table 3).

The alterations in PPT values in the trapezius ($p<0.001$), SCM ($p=0.002$), and paraspinal ($p=0.002$) muscles posttreatment were considerably greater in Group 1 than in Group 2 as compared to pretreatment measurements (Table 3).

Considering the changes in cervical ROM values after treatment compared to before treatment, the change in active extension ROM ($p=0.02$), active right rotation ROM ($p<0.001$), active left rotation ROM ($p<0.001$), passive extension ROM ($p=0.05$), passive right rotation ROM ($p<0.001$), passive left rotation ROM ($p<0.001$) values in Group 1 was significantly higher than Group 2. No statistically significant differences were noted between the groups for alterations in other cervical ROM values ($p>0.05$) (Table 3).

The change in NDI scores posttreatment was significantly greater in Group 1 than in Group 2 ($p=0.001$) (Table 3).

When the changes after treatment compared to before treatment were evaluated in terms of NHP scores, the changes in NHP-pain score ($p=0.001$), NHP-emotional score ($p<0.001$), NHP-sleep score ($p=0.007$) and NHP Part 1 total score ($p=0.008$) were

TABLE 3
Comparison of changes after treatment compared to before treatment in terms of evaluation parameters between groups

	Group 1 (n=30)			Group 2 (n=30)			
	Mean±SD	Median	Min-Max	Mean±SD	Median	Min-Max	*p*
VAS-movement change (cm)		3.75	0.9-5.1		2.3	1.2-5.3	<0.001*
VAS-rest change (cm)	2.9±1.4		0-5.9	2±1.3		0-4.6	0.007*
TP number change-trapezius		1	0-3		1	0-2	0.008*
TP number change-SCM		1	–1-2		0.5	0-2	0.054
TP number change-paraspinal		1	0-1		0	–1-1	0.02*
PPT change-trapezius (lb/cm²)	3.7±0.8		1.7-5.1	2.7±1.1		1.3-5.9	<0.001*
PPT change-SCM (lb/cm²)		2.6	1.3-4.5		1.9	–6.7-4.1	0.002*
PPT change-paraspinal (lb/cm²)		2.6	0-5.1		0	–5.6-4.7	0.002*
Active flexion ROM change (°)		5	0-15		5	0-20	0.21
Active extension ROM change (°)		10	5-15		5	0-15	0.02*
Active right lateral flexion ROM change (°)		5	0-10		5	0-15	0.37
Active left lateral flexion ROM change (°)		5	0-15		5	0-15	0.29
Active right rotation ROM change (°)		10	5-20		5	0-15	<0.001*
Active left rotation ROM change (°)		10	5-20		5	0-15	<0.001*
Passive flexion ROM change (°)		5	0-10		5	0-15	0.19
Passive extension ROM change (°)		5	0-15		5	0-10	0.05*
Passive right lateral flexion ROM change (°)		5	–5-10		5	0-10	0.72
Passive sol lateral flexion ROM change (°)		5	–5-15		5	0-15	0.23
Passive right rotation ROM change (°)		10	0-20		5	0-15	<0.001*
Passive left rotation ROM change (°)		10	0-20		5	0-15	<0.001*
NDI change		10.5	2-30		5.5	2-28	0.001*
NHP-pain score change		29.7	10.5-46.1		14.4	–347.1-50.6	0.001*
NHP-emotion score change		14.6	0-39.5		0	0-55.4	<0.001*
NHP-sleep score change		21.7	0-49.7		0	0-87.4	0.007*
NHP-social score change		0	0-20.1		0	–19.4-44.5	0.28
NHP-physical activity score change		20.7	8.9-34.3		22.3	0-34.4	0.81
NHP-energy score change		12	0-39.2		12	0-76	0.95
NHP-part 1 total score change		97.8	17.8-186.3		59.8	9-270	0.008*
NHP-part 2 total score change		2	0-3		2	0-4	0.25

SD: Standard deviation; VAS: Visual Analog Scale; TP: Trigger point; PPT: Pressure pain threshold; SCM: Sternocleidomastoideus; ROM: Range of motion; NDI: Neck disability index; NHP: Nottingham health profile; * Statistical significance level p<0.05.

significantly higher in Group 1 than in Group 2. No statistically significant difference was detected between the groups in terms of alterations in other NHP scores ($p>0.05$) (Table 3).

DISCUSSION

Recent studies have examined the efficacy of MRT, a non-invasive therapy approach, for MPS.[18-20] Although the results obtained from the studies are promising, the data are still very insufficient.[20] In the present study, we assessed the efficacy of MRT on pain, TP number, PPT, ROM, neck disability, and quality of life in individuals with MPS. Our study results showed that MRT provides positive effects on pain, TP numbers, PPT measurements, cervical ROM, neck disability, and quality of life.

In recent years, studies reporting the benefits of MRT on pain, functionality, and quality of life in musculoskeletal problems accompanied by pain, particularly chronic neck, chronic low back, and fibromyalgia, have increased in the literature.[8,18,20-28]

While the need for treatment modalities with clearly proven efficacy and consensus on treatment for cervical MPS continues, studies evaluating the effectiveness of MRT, which is a promising method, as it is a targeted intervention, are still very few. A meta-analysis by Wang et al.[27] assessed the impact of manual soft tissue therapy, including MRT, on individuals with chronic neck pain. This study, one of the few in its domain, indicated a beneficial effect on pain but did not provide insights into the long-term effects. Another meta-analysis by Overmann et al.[23] assessed the efficacy of MRT in adults with chronic neck pain, revealing a significant decrease in pain as indicated by VAS scores. Notable differences were found in right rotation and right lateral flexion; however, the impact on joint ROM remains ambiguous, and no significant enhancement in pressure pain threshold was noted, necessitating further investigation. In the meta-analysis published by Guo et al.,[21] in which they evaluated the effect of MRT on pain and functionality in patients with chronic mechanical neck pain, MRT provided significantly more improvement in pain pressure thresholds in the trapezius and suboccipital muscles compared to conventional treatments; however, its effect on pain, rotation, flexion, extension, lateral flexion and disability determined by NDI did not significantly differ from conventional treatments.

Pain is the most overt and chief complaint of MPS. In the literature, most studies evaluating the effectiveness of different physical therapy modalities, exercise applications and MRT on neck pain have shown that MRT provides additional positive effects on pain palliation.[29-34] In our study, we believe that the greater change in VAS after treatment compared to before treatment in the MRT group can be explained by pathophysiological processes such as relaxation of fascial structures, vasodilation, removal of pain mediators in the environment with MRT. Kostopoulos and Rizopoulos[35] reported that the reduction in pain with MRT triggered a spinal reflex mechanism leading to reflex relaxation of the relevant muscle in myofascial TPs and, thus, MRT acted by reducing energy consumption in the sarcomere. The MRT eliminates inflammatory exudates and pain metabolites generated in TPs, deconstructs scar tissue, desensitizes nerve endings, and diminishes muscular tone.[36] In myofascial release application, blood flow is also increased by producing heat. Thus, the fascia softens, lengthens, and regains its former shape.[37] Rodríguez-Huguet and Lomas Vega[29] and Chaudhary et al.[32] evaluated the PPTs of TPs in the patients and observed that there was a significant increase in the PPT in the group receiving MRT after the treatment. Although no similar study evaluating the effects of MRT on TP numbers and PPTs has been found in the literature, we believe that the further decrease in the number of TP and increase in the PPTs in the MRT group in our study is due to the disappearance of fascial restrictions and occlusions, the elongation of the fascia, and the elimination of the energy crisis.

In the current study, the NDI scores indicated that the posttreatment modifications in the MRT group were substantially greater than those in the control group. Pawaria and Kalra[33] conducted a study that revealed a statistically significant enhancement in neck impairment among participants receiving MRT. Similarly, in the study of Rodríguez-Fuentes et al.,[30] MRT was more effective on the neck disability index compared to manual therapy. We believe that the positive effect of MRT on pain may be the reason for the decrease in disability.

In the present study, the quality of life assessed by NHP Part 1 and NHP Part 2 scores was significantly better after treatment compared to before treatment in both study groups. Regarding posttreatment alterations relative to pretreatment, the change in NHP Part 1 score was considerably greater in the MRT group; however, the change in NHP Part 2 score was comparable between the groups. In their study by Yüksel et al.,[38] which aimed to evaluate whether the items in the Turkish version of the NHP function differently according to different factors related to patients using the Mixed Rasch Model, age and sex were variables affecting the item responses of the NHP, while the duration of pain was not a significant variable. This difference between NHP Part 1 total and NHP Part 2 total scores may be due to other factors affecting NHP assessment.

The main limitations to our study include that our posttreatment follow-up period was limited to only 15 days, that all groups were given a classical physical therapy program for ethical and medical reasons and, therefore, there was no group in which we could evaluate the effectiveness of MRT alone. On the other hand, the strengths of our study include its status as one of the few studies assessing the efficacy of MRT in patients with cervical myofascial pain, its prospective methodology, and a larger patient cohort compared to analogous studies. Additionally, unlike similar studies, examining the effectiveness of MRT on the number of TP is one of the superior aspects of our study. We believe that the fact that the MRT method is presented as an easy-to-apply and lower-risk treatment option that can be an alternative to other techniques that are invasive or involve manipulation is a critical contribution of our study to clinical practice. However, the lack of studies on the subject still highlights the need for more research to determine the effectiveness of MRT, the importance of establishing standard protocols, and the need for studies evaluating long-term effects and making direct comparisons with classical treatments.

In conclusion, MRT treatment, when combined with standard physical therapy, demonstrates superior efficacy compared to standard physical therapy alone regarding pain, number of TPs, PPT, cervical ROM, neck impairment, and quality of life. Taken together, MRT appears to be an effective treatment for cervical MPS as it is non-invasive, easy to apply, inexpensive, and has a low side effect profile.

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REFERENCES

1. Liu C, Wang Y, Yu W, Xiang J, Ding G, Liu W. Comparative effectiveness of noninvasive therapeutic interventions for myofascial pain syndrome: A network meta-analysis of randomized controlled trials. Int J Surg 2024;110:1099-112. doi: 10.1097/JS9.0000000000000860.
2. He P, Fu W, Shao H, Zhang M, Xie Z, Xiao J, et al. The effect of therapeutic physical modalities on pain, function, and quality of life in patients with myofascial pain syndrome: A systematic review. BMC Musculoskelet Disord 2023;24:376. doi: 10.1186/s12891-023-06418-6.
3. Chen J, Yin L, Hu Q, Liu S, Zeng L. Manipulative treatment of myofascial pain syndrome: A network meta-analysis based on randomized controlled trials. J Pain Res 2025;18:1923-33. doi: 10.2147/JPR.S517869.
4. Cao QW, Peng BG, Wang L, Huang YQ, Jia DL, Jiang H, et al. Expert consensus on the diagnosis and treatment of myofascial pain syndrome. World J Clin Cases 2021;9:2077-89. doi: 10.12998/wjcc.v9.i9.2077.
5. Steen JP, Jaiswal KS, Kumbhare D. Myofascial pain syndrome: An update on clinical characteristics, etiopathogenesis, diagnosis, and treatment. Muscle Nerve 2025;71:889-910. doi: 10.1002/mus.28377.
6. Barnes MF. The basic science of myofascial release: morphologic change in connective tissue. Bodyw Mov Ther 1997;1:231-8.
7. Swann E, Graner SJ. Uses of manual-therapy techniques in pain management. Athl Ther Today 2002;7%14-7.
8. Lv Y, Yin Y. A review of the application of myofascial release therapy in the treatment of diseases. J Multidiscip Healthc 2024;17:4507-17. doi: 10.2147/JMDH.S481706.
9. In: Simons DG, Travell JG, Simons LS, Cummings BD, editors. Vol 1. Upper half of body. 2nd ed. Baltimore: Lippincott Williams and Wilkins; 1999.
10. Earlsi J, Meyers T. Fascial Release for Structural Balance. 1st ed. Kalifornia: North Atlantic Books; 2014.
11. Schwind P, Myers TW, Barral JP, editors. Fascial ve membrane technique: A manual for comprehensive treatment of the connective tissue system. Amsterdam: Churchill Livingstone; 2006. doi: 10.1016/B978-0-443-10219-6.X5001-2.
12. Hawker GA, Mian S, Kendzerska T, French M. Measures of adult pain: Visual Analog Scale for Pain (VAS Pain), Numeric Rating Scale for Pain (NRS Pain), McGill Pain Questionnaire (MPQ), Short-Form McGill Pain Questionnaire (SF-MPQ), Chronic Pain Grade Scale (CPGS), Short Form-36 Bodily Pain Scale (SF-36 BPS), and Measure of Intermittent and Constant Osteoarthritis Pain (ICOAP). Arthritis Care Res (Hoboken) 2011;63 Suppl 11:S240-52. doi: 10.1002/acr.20543.
13. Kaya T. Eklemlerin ve kasların motor ve duyusal işlevlerinin değerlendilmesi. In: Beyazova M, Kutsal YG, editörler. Fiziksel Tıp ve Rehabilitasyon. Ankara: Güneş Tıp Kitapevi; 2016. s. 241-75.
14. Vernon H, Mior S. The neck disability index: A study of reliability and validity. J Manipulative Physiol Ther 1991;14:409-15.
15. Kesiktas N, Ozcan E, Vernon H. Clinimetric properties of the Turkish translation of a modified neck disability index. BMC Musculoskelet Disord 2012;13:25. doi: 10.1186/1471-2474-13-25.
16. Hunt SM, McEwen J, McKenna SP. Measuring health status: A new tool for clinicians and epidemiologists. J R Coll Gen Pract 1985;35:185-8.
17. Kücükdeveci AA, McKenna SP, Kutlay S, Gürsel Y, Whalley D, Arasil T. The development and psychometric assessment of the Turkish version of the Nottingham Health Profile. Int J Rehabil Res 2000;23:31-8. doi: 10.1097/00004356-200023010-00004.
18. Werenski J. The Effectiveness Of Myofascial Release Techniques In The Treatment Of Myofascial Pain. logan. A literature review. 2011. Available at: https://www.logan.edu/mm/files/LRC/Senior-Research/2011-Aug-34.pdf
19. Tozzi P, Bongiorno D, Vitturini C. Fascial release effects on patients with non-specific cervical or lumbar pain. J Bodyw Mov Ther 2011;15:405-16. doi: 10.1016/j.jbmt.2010.11.003.

20. Ajimsha MS, Al-Mudahka NR, Al-Madzhar JA. Effectiveness of myofascial release: Systematic review of randomized controlled trials. J Bodyw Mov Ther 2015;19:102-12. doi: 10.1016/j.jbmt.2014.06.001.
21. Guo Y, Lv X, Zhou Y, Li Z, She H, Bai L, et al. Myofascial release for the treatment of pain and dysfunction in patients with chronic mechanical neck pain: Systematic review and meta-analysis of randomised controlled trials. Clin Rehabil 2023;37:478-93. doi: 10.1177/02692155221136108.
22. Mittal S, Sharma S. Effect of myofascial release and muscle energy technique on patients with chronic neck pain: A scoping review. Phys Act Nutr 2024;28:45-51. doi: 10.20463/pan.2024.0007.
23. Overmann L, Schleip R, Anheyer D, Michalak J. Effectiveness of myofascial release for adults with chronic neck pain: A meta-analysis. Physiotherapy 2024;123:56-68. doi: 10.1016/j.physio.2023.12.002.
24. Wu Z, Wang Y, Ye X, Chen Z, Zhou R, Ye Z, et al. Myofascial release for chronic low back pain: A systematic review and meta-analysis. Front Med (Lausanne) 2021;8:697986. doi: 10.3389/fmed.2021.697986.
25. Chen Z, Wu J, Wang X, Wu J, Ren Z. The effects of myofascial release technique for patients with low back pain: A systematic review and meta-analysis. Complement Ther Med 2021;59:102737. doi: 10.1016/j.ctim.2021.102737.
26. Narenthiran P, Granville Smith I, Williams FMK. Does the addition of manual therapy to exercise therapy improve pain and disability outcomes in chronic low back pain: A systematic review. J Bodyw Mov Ther 2025;42:146-52. doi: 10.1016/j.jbmt.2024.12.004.
27. Wang SQ, Jiang AY, Gao Q. Effect of manual soft tissue therapy on the pain in patients with chronic neck pain: A systematic review and meta-analysis. Complement Ther Clin Pract 2022;49:101619. doi: 10.1016/j.ctcp.2022.101619.
28. Ughreja RA, Venkatesan P, Balebail Gopalakrishna D, Singh YP. Effectiveness of myofascial release on pain, sleep, and quality of life in patients with fibromyalgia syndrome: A systematic review. Complement Ther Clin Pract 2021;45:101477. doi: 10.1016/j.ctcp.2021.101477.
29. Rodríguez-Huguet M, Lomas-Vega R. Response to the letter to the editor on "effects of myofascial release on pressure pain thresholds in patients with neck pain: A single-blind randomized controlled trial". Am J Phys Med Rehabil 2019;98:e4-5. doi: 10.1097/PHM.0000000000000986.
30. Rodríguez-Fuentes I, De Toro FJ, Rodríguez-Fuentes G, de Oliveira IM, Meijide-Faílde R, Fuentes-Boquete IM. Is myofascial release therapy cost-effective when compared with manual therapy to treat workers' mechanical neck pains? J Manipulative Physiol Ther 2020;43:683-90. doi: 10.1016/j.jmpt.2018.11.037.
31. Shacksnovis R. The relative effectiveness of myofascial manipulation versus ischaemic compression in the treatment of myofascial trigger points of the upper trapezius muscle. Midlands: DUT; 2005. Available at: https://openscholar.dut.ac.za/items/0af94505-9586-4421-a662-761d4012642f.
32. Chaudhary ES, Shah N, Vyas N, Khuman R, Chavda D, Nambi G, et al. Comparative study of myofascial release and cold pack in upper trapezius spasm. Int J Health Res 2013;3:12.
33. Pawaria S, Kalra S. Comparing effectiveness of myofascial release and muscle stretching on pain, disability and cervical range of motion in patients with trapezius myofascial trigger points. Indian J Health Sci Care 2015;2:8-13.
34. Ravish VN, Shridhar S, Helen S. To compare the effectiveness of myofascial release technique versus positional release technique with laser in patients wıth unilateral trapezitis. J Evol Med Dent Sci 2014;3:2161-6.
35. Kostopoulos D, Rizopoulos K. The manual of trigger point and myofascial therapy. 1st ed. New Jersey: Slack Incorporated; 2024.
36. Irnich D, Behrens N, Gleditsch JM, Stör W, Schreiber MA, Schöps P, et al. Immediate effects of dry needling and acupuncture at distant points in chronic neck pain: Results of a randomized, double-blind, sham-controlled crossover trial. Pain 2002;99:83-9. doi: 10.1016/s0304-3959(02)00062-3.
37. Hou CR, Tsai LC, Cheng KF, Chung KC, Hong CZ. Immediate effects of various physical therapeutic modalities on cervical myofascial pain and trigger-point sensitivity. Arch Phys Med Rehabil 2002;83:1406-14. doi: 10.1053/apmr.2002.34834.
38. Yüksel S, Elhan AH, Gökmen D, Küçükdeveci AA, Kutlay Ş. Analyzing differential item functioning of the Nottingham Health Profile by Mixed Rasch Model. Turk J Phys Med Rehabil 2018;64:300-7. doi: 10.5606/tftrd.2018.2796.