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ROLE OF FOCUSED TRANSCUTANEOUS NEUROMODULATION IN THE ASSESSMENT AND TREATMENT OF MYOFASCIAL PAIN SYNDROME: A PILOT STUDY

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ABSTRACT

Myofascial pain syndrome (MPS) is an extremely widespread and insidious pathology characterized by strong musculoskeletal pain that is associated with the presence of myofascial trigger points. Its etiopathogenesis is very complex and, among the main symptoms of the disorder, there is pain and the modification of the postural and biomechanical settings of the affected patients. Multiple therapeutic approaches have been successfully proposed over time for MPS, at a pharmacological, manual, instrumental, and physical level. Among the most interesting instrumental approaches, there is neuromodulation (NM), which in most cases is invasively performed through percutaneous modality. Therefore, to bypass the invasiveness of percutaneous NM, we performed a study to evaluate the short-term effectiveness of a new treatment modality using Focused Transcutaneous Neuromodulation (FTNM) which is designed to be less invasive and more tolerable than percutaneous NM, for patients suffering from MPS. 27 patients (average age of 56 ± 15.1 years) were selected and underwent a single session of FTNM applied according to the Bio-Physico-Metric approach, consisting in the research and treatment of the most dysfunctional myofascial trigger points (MTrPs) in the patient's body through a bioimpedance investigation. Patients were assessed with the Numeric Pain Rating Scale (NPRS) and the evaluation of the Postural Biometric Index (PBI), calculated by a specific baropodometric device, before (T0) and after (T1) the treatment session. At the end of the study, it was possible to observe a significant improvement both in pain (-37.3%) and in the degree of postural dysfunction (-25.1%). Therefore, we can state that FTNM applied with Bio-Physico-Metric modality is a promising and effective therapeutic approach in controlling the symptoms associated with MPS.

KEYWORDS: *myofascial pain syndrome, chronic pain, trigger point, electrotherapy, transcutaneous electrical stimulation, rehabilitation*

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INTRODUCTION

Myofascial pain syndrome (MPS) is one of the most common and frequent causes of pain, reaching peak prevalence levels in the general population of up to 85% (1). In fact, it is estimated that up to 95% of the general population has received a diagnosis of MPS at least once in their life in the presence of musculoskeletal pain (1). This syndrome is capable of causing a multitude of musculoskeletal problems of various kinds, particularly in terms of neck pain and low back pain, but also at the level of the pelvis and limbs. In general, MPS is characterized by the presence of diffuse, local, and radiating musculoskeletal pain, associated with the presence of Myofascial Trigger Points (MTrPs) (1,2). According to the universally accepted definition given by Simons and Travel, a MTrP can be defined as "a hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. The spot is painful on manual compression and can give rise to characteristic referred pain, referred tenderness, motor dysfunction, and autonomic phenomena" (3). Although the genesis and chronicity processes of MPS are still unclear and much debated in the literature, it is widely probable that the pain perception of affected patients is characterized by phenomena of centralization of pain due to localized structural changes due to MTrPs and aberrations in the mechanism of nervous input-output at the peripheral nervous level (4). In particular, in the presence of MTrPs causing MPS, it is possible to witness a dysregulation of the reflex central nervous control mechanisms with respect to the responses to visceral and somatic afferents that characterize the patient with MPS (5). Since these somatic and visceral reflex control mechanisms are very responsive to external stimuli of both aberrant and rebalancing types, it is possible to identify MTrPs, intended as the maximum structural expression of these somatic alterations, as an ideal therapeutic target in patients affected by MPS (6-9).

It should be emphasized that MTrPs, which are characterized by locoregionality and well-defined referred pain patterns, differ from the so-called tender points, which are areas of soft tissue that are not exclusively muscular and are characterized by widespread tension and typical of generalized syndromes such as fibromyalgia (10).

A valid approach to identify and adequately treat MTrPs would appear to be the Bio-Physico-Metric one (11,12). This approach is based on the identification of the so-called key MTrPs, i.e. those trigger points that are able to determine the appearance of pain and functional limitation both in their anatomical location and in areas distant from them, according to a hierarchical development scheme of satellite MTrPs (11,12). The key MTrPs can be identified by impedance measurement, palpation, and investigation (using specific questionnaires) and their deactivation can contribute to quickly and lastingly rebalancing the patient's musculoskeletal health status (11,12).

Once the MTrPs responsible for the patient's pathological condition have been identified, especially in the presence of MPS, these can be stimulated in different ways to try to bring the muscle tissue back to a state of balance. The therapeutic approach to MTrPs can be based on manual therapy, instrumental treatments, and pharmacological approaches (4).

Among the most interesting instrumental approaches for MTrPs and musculoskeletal pain in general is certainly neuromodulation (NM). NM is a therapy based on the use of a focused current aimed at inducing neuro-metabolic stimulation to the target area that can modulate the information flow at the level of the affected neuronal circuit (13). In particular, the application of NM seems to exploit a phenomenon of modulation of synaptic activity at the nervous level, producing a controlled release of neurochemical substances capable of inducing a series of therapeutic activities at the nervous level (13). This mechanism would seem to lead to evident effects, especially in the control of perceived local and radiated pain, through mechanisms connected to the gate control theory (14,15) and the modulation of pain perception at the level of the central nervous system (14,16). Although these mechanisms have not yet been fully clarified to date, NM in all its forms (percutaneous, transcutaneous, implantological, etc.) appears to be one of the most interesting and effective non-pharmacological therapeutic techniques for the modulation of pain, particularly in the presence of MPS, MTrPs, and musculoskeletal dysfunctions in general (17-19).

Therefore, considering the widespread use of NM techniques for musculoskeletal pain control in the rehabilitation field, we decided to study the effectiveness of Focused Transcutaneous Neuromodulation (FTNM) applied with a Bio-Physical-Metric approach on MPS patients.

MATERIALS AND METHODS

The present research pilot study was carried out at the Ce.Fi.R.R. Gemelli Molise Point (Termoli, Italy) from January to March of 2023.

The rehabilitation protocol to which the patients were subjected is safe, as all the procedures applied to patients comply with the safety regulations in force in the country where the study was carried out; the protocol is accessible to all patients who do not highlight specific contraindications to the initial clinical evaluation that is necessary for all patients who access

the facility where the study was carried out. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Written informed consent was obtained at enrolment from participants who were willing and able. By virtue of all these considerations and the lack of incontrovertible national legislation regarding the need for submission of retrospective and/or non-pharmacological studies to an ethics committee, the normal ethics committee clearance was not required (20,21).

A total of 27 patients (14 women and 13 men, Caucasian ethnicity, average age of 56 ± 15.1 years) suffering from MPS and other visceral symptoms were recruited within the Ce.Fi.R.R. Gemelli Molise Point. The presence for at least 6 months of frequent symptoms of back pain and the presence of knotty and painful muscle areas upon palpation in the lower back area allowed physiatrists in charge of the initial clinical evaluation of each patient to diagnose the presence of chronic MPS associated to MTrPs. It should be emphasized that although MPS typically presents itself as an acute pathology that resolves within a few weeks of the onset of the trauma, in some cases this pathology takes on the characteristics of a chronic health problem, with a duration of symptoms that ranges from a minimum of 6 months up to several years and a severity of the pathology proportional to its persistence over time (22).

Furthermore, it should be highlighted that some studies have shown a rather linear correlation between the presence of MPS and the onset of chronic low back pain (23,24). This relationship, which would appear to be independent of any structural alterations visible at the vertebral level and through MRI, could depend on mechanical and painful-irradiative factors due to the MTrPs present in the lower back muscles, with a direct proportional relationship between the number of muscles involved and the severity of the pathology (23,24).

The inclusion criteria included an age between 30 and 80 years and the presence of MPS. The exclusion criteria included all the typical contraindications for treatment with electrotherapies (cancer, pregnancy, electronic implants, serious vascular and cardiac diseases, epilepsy), as well as severe neurological impairments and clear sensory alterations.

The patients considered for the study underwent evaluations before (T0) and after (T1) a single treatment session with FTNM through:

- The Numeric Pain Rating Scale (NPRS): NPRS is one of the most common tools for measuring subjectively perceived pain by patients. It is a derivate of the Visual-Analogue Scale (VAS) divided into ten levels, usually distributed equidistant on a 10 cm long strip, which corresponds to the level of pain perceived by the patient at the time of the evaluation, and where 0 is the total absence of pain and 10 is the maximum level of pain imaginable and/or ever experienced (25). This scale is reliable, effective, and easy to apply even in the presence of dysfunctions of the musculoskeletal system such as MPS (25). In the case of the present study, patients were asked to express a value from 0 to 10 corresponding to the maximum level of pain perceived at the level of the lower back in the most insidious point for them (then identified as the location of the MTrPs being treated, variable from subject to subject among those in the observed sample and responsible for their MPS);
- Postural Biometric Index (PBI): PBI is an index calculated by Milletrix 3.0 platform software (Diasu Health Technologies, Rome, Italy) on the basis of a stabilometric evaluation carried out using the same device (26). This index takes into account the parameters of center of pressure, symmetry of bipodalic load, symmetry of retro-forefoot load, angle of centers of pressure, podalic angle, location of maximum pressure point, symmetry of support surface, and center of gravity deviation-center of pressure (26). These parameters are then calculated to obtain an index that quantifies the patient's postural state, which can often be altered in the presence of MPS (26). The PBI value is considered healthy from 0 to 10 and dysfunctional if >10.

Patients in the studied population underwent a single treatment session of FTNM applied through a device called Monos (AD SWISS MEDTECH SA, Gravesano, Switzerland, granted in use by A CIRCLE S.p.A., San Pietro in Casale, Italy). Following the principles of the Bio-Physical-Metric approach, the Monos instrument was first used in skin impedance evaluation mode, at a fixed frequency of 60 Hz. Through this mode, it was possible to investigate various points of a standard dermatomal map in search of the Key MTrPs within approximately 10 minutes, to stimulate in the lower back area, starting from the point that the patient had identified as most painful at the NPRS assessment. After identifying the focal points of the treatment, the Monos instrument was used at a frequency oscillating between 15 and 60 Hz along the dermatomal course of the areas hosting key MTrPs. The therapeutic portion of the Monos treatment took approximately 20 minutes for each patient.

At the end of the study data collection, statistical analysis was carried out using the Wilcoxon Signed Rank test for dependent samples, performed through the Statistics Kingdom online calculator (https://www.statskingdom.com, Melbourne, Australia).

RESULTS

The analysis of the results of the NPRS values highlighted a significant improvement in the painful symptoms experienced by the studied patients ($p < 0.01$), with an average percentage reduction in pain equal to -37.3% (Fig.1).

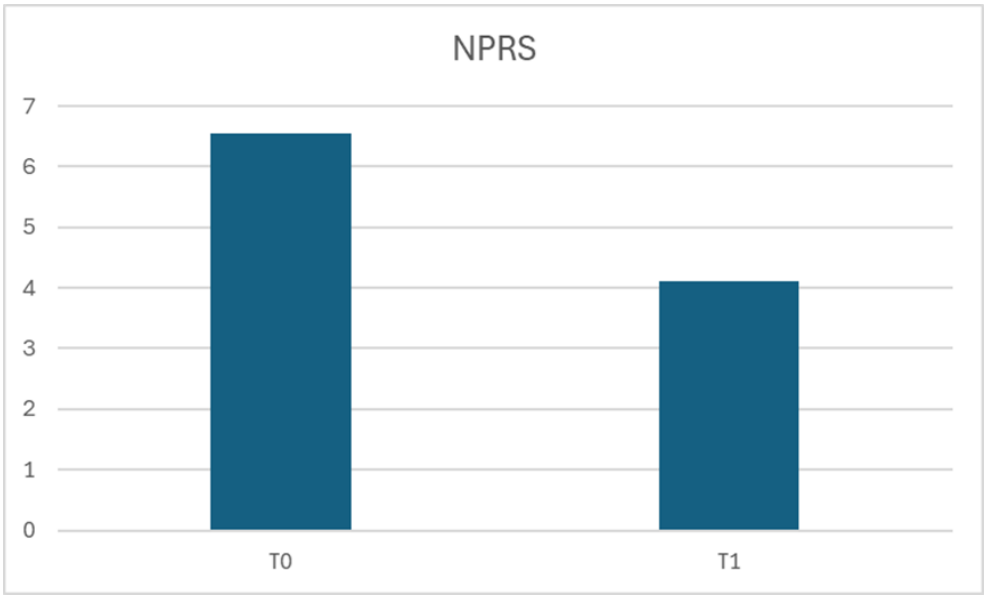

Fig. 1. *Change in NPRS values between T0 and T1.*

Similarly, the analysis of the results of the PBI values highlighted a significant improvement in the postural structure of the studied patients ($p < 0.01$), with an average percentage reduction in pain equal to -25.1% (Figure 2). The final average value, equal to a score of 10.29, although remaining above the maximum threshold of postural normality, equal to 10 according to the PBI system applied, markedly approached the ideal range (from 0 to 10 points).

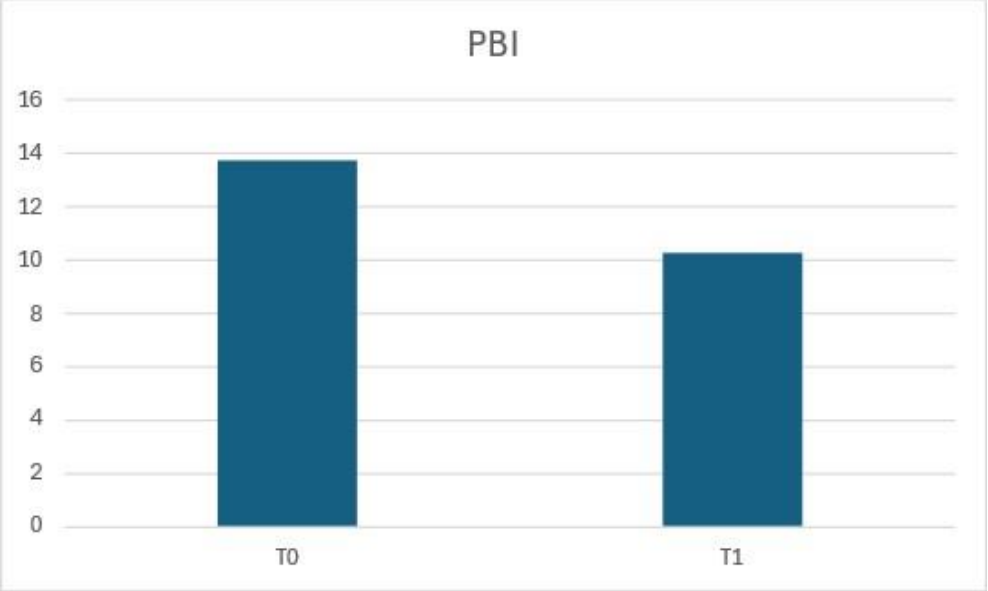

Fig. 2. *Change in PBI values between T0 and T1.*

DISCUSSION

At the end of the study, it was possible to note how MPS patients subjected to a single session of FTNM applied with a Bio-Physical-Metric approach obtained a significant improvement in both subjectively perceived musculoskeletal pain assessed using the NPRS (-37. %) and the value of the postural-biomechanical setting assessed by PBI (-25.1%).

MPS is a complex and very frequent disorder of the musculoskeletal system which is characterized by the presence of widespread pain and MTrPs (27). The causes are typically multifactorial (27), including functional aspects (reduced or

increased muscle use), traumatic, ergonomic (incorrect posture and biomechanics), structural (osteoarthritis, scoliosis, etc.) and systemic (hypothyroidism, Vitamin D deficiency and/or or Iron, etc.), as well as psycho-emotional causes (28).

A key role in the management of the pathology seems to lie in the deactivation of MTrPs through modalities ranging from local injection to manual and electrotherapeutic applications (29,30). In particular, the management of these MTrPs should focus on both central and peripheral nervous desensitization to the abnormal nociceptive stimuli that are perceived by the patient (30).

One of the most effective and promising therapeutic strategies in the management of musculoskeletal pain from MTrPs is that of NM, consisting of electrical stimulation, typically with a percutaneous electro-needle, of a portion of musculoskeletal tissue where MTrPs and myofascial pain are present (18,31). Given the therapeutic efficacy highlighted by percutaneous NM in multiple studies (18,31,32), it is not surprising that a very similar technique at a conceptual level such as FTNM was effective in modulating the pain of the patients studied. Furthermore, in addition to the effectiveness of the treatment studied, it should be underlined that its transcutaneous application, without resorting to piercing the patient's tissues, guarantees less invasive treatment, resulting in greater compliance on the part of the patients.

It must also be considered that MPS is a pathology that is widespread throughout the patient's body, often mainly affecting the tonic-postural muscles, especially at the level of hips and spine (33). It is no coincidence that the postural and biomechanical alterations that affect the back (both in the cervical and lumbar spine), the hips, and the shoulder joint are often identified among both the causative and perpetuating factors of MPS (34-36). It is also no coincidence that various therapeutic interventions based on exercise, manual therapy, or electrotherapy, have proven useful in improving the posture of patients suffering from MPS and myofascial dysfunctions in general, highlighting a proportionality between the improvement of posture and that of painful symptoms (37,38). In our case, the intervention using FTNM according to the Bio-Physical-Metric approach to the treatment of MTrPs proved useful in improving the posture of the treated patients, confirming the trend observed in the literature.

Although the results obtained are positive and encouraging, it is appropriate to underline some weak points of our study. First of all, the sample appears to be relatively small compared to the general diffusion of MPS. Furthermore, it is also possible to highlight a certain variability in the age of the patients enrolled. In addition, it must be considered that the study was carried out without a control group (either no-treatment or sham) and that the treatment was performed for a single session, in the absence of follow-up.

Despite this, the results obtained were positive and encouraging, considering both the efficacy seen in treatment and its broad tolerability by the patients studied. Furthermore, given the transcutaneous and minimally invasive nature of the NM treatment applied, no side effects associated with the treatment were detected.

CONCLUSIONS

The treatment of MTrPs according to the Bio-Physico-Metric approach through FTNM is effective in significantly improving, in the short term, pain and postural dysfunction in patients suffering from MPS. These results are important and encouraging as they allow us to identify a new rapid, relatively economical, and minimally invasive therapeutic approach to the treatment of a complex pathology such as MPS.

By virtue of the positivity of the results obtained, it would be desirable in the future to investigate the effectiveness of the therapeutic approach we tested in a more in-depth and extensive manner, through controlled and randomized studies on a large sample and for an extended period of time.

Conflict of interest

The authors declare that they have no conflict of interest.

REFERENCES

1. Lam C, Francio VT, Gustafson K, Carroll M, York A, Chadwick AL. Myofascial pain–A major player in musculoskeletal pain. *Best Practice & Research Clinical Rheumatology*. 2024;38(1):101944.
2. Cao QW, Peng BG, Wang L, et al. Expert consensus on the diagnosis and treatment of myofascial pain syndrome. *World journal of clinical cases*. 2021; 9(9):2077-2089.
3. Simons DG, Travel JG, Simons LS. *Myofascial Pain and Dysfunction: The Trigger Point Manual (Vol. 1) The Upper Half of Body, 2nd edition*. Lippincott Williams & Wilkins ed. Baltimore; 1999.

4. Galasso A, Urits I, An D, et al. A comprehensive review of the treatment and management of myofascial pain syndrome. *Current pain and headache reports*. 2020; 24:1-11.
5. Sell R, Erdelyi A, Schaefer H. Untersuchungen über den Einfluß peripherer Nervenreizung auf die sympathische Aktivität. *Pflügers Archiv*. 1958; 267:566–581.
6. Sato A, Schmidt RF. The modulation of visceral functions by somatic afferent activity. *The Japanese Journal of Physiology*. 1987; 37(1):1-7.
7. Sato A, Sato Y, Sugimoto H, Terui N. Reflex changes in the urinary bladder after mechanical and thermal stimulation of the skin at various segmental levels in cats. *Neuroscience*. 1977; 2:111-117.
8. Feng B, Brumovsky PR, Gebhart GF. Differential roles of stretch-sensitive pelvic nerve afferents innervating mouse distal colon and rectum. *American journal of physiology. Gastrointestinal and liver physiology*. 2010; 298(3):G402-409.
9. Cervero F. Spinal cord hyperexcitability and its role in pain and hyperalgesia. *Experimental brain research*. 2009; 196(1):129-137.
10. Borg-Stein J, Stein J. Trigger points and tender points: one and the same? Does injection treatment help? *Rheumatic Disease Clinics*. 1996; 22(2):305-322.
11. Barassi G, Pellegrino R, Di Matteo C, et al. Bio-Physico-Metric Approach: Assessment and Treatment of Key Myofascial Trigger Points through an Adaptive Neuromodulation Device. *Journal of Biological Regulators and Homeostatic Agents*. 2023; 37(1):25-29.
12. Barassi G, Di Simone E, Supplizi M, et al. Bio-Physico-Metric approach: Integrated postural assessment in musculoskeletal dysfunctions. *Journal of Biological Regulators and Homeostatic Agents*. 2022; 36(1):129-135.
13. Sayenko DG, Bazo HA, Horner PJ, Taccola G. Neuromodulation and restoration of motor responses after severe spinal cord injury. *Cellular, Molecular, Physiological, and Behavioral Aspects of Spinal Cord Injury*. 2022; 51-63.
14. Deogaonkar M. Peripheral neuromodulation for chronic pain. *Neurology India*. 2020; 68(Suppl 2):S224-230.
15. Melzack R, Wall PD. Pain Mechanisms: A New Theory: A gate control system modulates sensory input from the skin before it evokes pain perception and response. *Science*. 1965; 150(3699):971-979.
16. Ellrich J, Lamp S. Peripheral nerve stimulation inhibits nociceptive processing: an electrophysiological study in healthy volunteers. *Neuromodulation: Technology at the Neural Interface*. 2005; 8(4):225-232.
17. Schabrun SM, Cannan A, Mullens R, et al. The effect of interactive neurostimulation therapy on myofascial trigger points associated with mechanical neck pain: a preliminary randomized, sham-controlled trial. *The Journal of Alternative and Complementary Medicine*. 2012; 18(10):946-952.
18. Ahmed S, Haddad C, Subramaniam S, Khattab S, Kumbhare D. The effect of electric stimulation techniques on pain and tenderness at the myofascial trigger point: a systematic review. *Pain Medicine*. 2019; 20(9):1774-1788.
19. Fidalgo-Martin I, Ramos-Álvarez JJ, Murias-Lozano R, Rodríguez-López ES. Effects of percutaneous neuromodulation in neuromusculoskeletal pathologies: A systematic review. *Medicine*. 2022; 101(41):e31016.
20. Winter, E.M., Maughan, R.J. Requirements for ethics approvals. *Journal of Sports Sciences.* 2009; 27(10):985.
21. De Sanctis V, Soliman AT, Daar S, Tzoulis P, Fiscina B, Kattamis C. Retrospective observational studies: Lights and shadows for medical writers. *Acta Bio Medica: Atenei Parmensis*. 2022, 93(5):e2022319.
22. Tantanatip A, Chang KV. Myofascial Pain Syndrome. PubMed. Published July 4, 2023. https://www.ncbi.nlm.nih.gov/books/NBK499882/
23. Rozhkov DO, Zinovyeva OE, Barinov AN, et al. Myofascial pain syndrome in female patients with chronic nonspecific back pain: diagnosis and treatment. *Neurology, Neuropsychiatry, Psychosomatics*. 2020; 12(2):57-63.
24. Yousefzadeh Chabok S, Ezzati K, Saberi A, Hosein Zadeh J. Evaluating the prevalence of lumbar myofascial pain syndrome in patients with non-specific chronic low back pain and a normal MRI study. *Journal of Guilan University of Medical Sciences*. 2020; 29(1):43-50.
25. Cheatham SW, Kolber MJ, Mokha M, Hanney WJ. Concurrent validity of pain scales in individuals with myofascial pain and fibromyalgia. *Journal of Bodywork and Movement Therapies*. 2018; 22(2):355-360.
26. Barassi G, Di Simone E, Galasso P, et al. Posture and health: are the biomechanical postural evaluation and the postural evaluation questionnaire comparable to and predictive of the digitized biometrics examination?. *International Journal of Environmental*

Research and Public Health. 2021; 18(7):3507.

27. Urits I, Charipova K, Gress K, et al. Treatment and management of myofascial pain syndrome. *Best Practice & Research Clinical Anaesthesiology*. 2020; 34(3):427-448.
28. San-Antolín-Gil M, López-López D, Becerro-de-Bengoa-Vallejo R, et al. Influence of psychological factors on myofascial pain. *The Neurobiology, Physiology, and Psychology of Pain. 2022*; 405-415.
29. Qureshi NA, Alsubaie HA, Ali GI. Myofascial pain syndrome: a concise update on clinical, diagnostic and integrative and alternative therapeutic perspectives. *International Neuropsychiatric Disease Journal*. 2019; 13(1):1-4.
30. Shah JP, Thaker N. Myofascial pain syndrome. *Fundamentals of Pain Medicine*. 2018; 177-184.
31. Fidalgo-Martin I, Ramos-Álvarez JJ, Murias-Lozano R, Rodríguez-López ES. Effects of percutaneous neuromodulation in neuromusculoskeletal pathologies: A systematic review. *Medicine*. 2022; 101(41):e31016.
32. Guzzi G, Della Torre A, Bruni A, et al. Anatomo-physiological basis and applied techniques of electrical neuromodulation in chronic pain. *Journal of Anesthesia, Analgesia and Critical Care*. 2024; 4(1):29.
33. Minerbi A, Vulfsons S. Challenging the Cinderella hypothesis: A new model for the role of the motor unit recruitment pattern in the pathogenesis of myofascial pain syndrome in postural muscles. *Rambam Maimonides medical journal*. 2018; 9(3):e0021.
34. Gerwin RD. Myofascial pain syndromes from trigger points. *Current review of pain*. 1999; 3(2):153-159.
35. Borg-Stein J, Iaccarino MA. Myofascial pain syndrome treatments. *Physical Medicine and Rehabilitation Clinics*. 2014; 25(2):357-374.
36. Roya M, Reza OG, Azadeh S, Reza HM, Saeed TM. Changes of joint position sense in responses to upper trapezius muscle fatigue in subclinical myofascial pain syndrome participants versus healthy control. *Muscles, Ligaments & Tendons Journal (MLTJ)*. 2018; 8(4):534-543.
37. Martínez-Jiménez EM, Becerro-de-Bengoa-Vallejo R, Losa-Iglesias ME, et al. Acute effects of myofascial induction technique in plantar fascia complex in patients with myofascial pain syndrome on postural sway and plantar pressures: A quasi-experimental study. *Physical Therapy in Sport*. 2020; 43:70-76.
38. Majidi L, Kargar Z, Alaei B, Nikoo MR. Comparison of The Effectiveness of Exercise Therapy and Electroacupuncture in Patients with Forward Head Abnormalities and Myofascial Pain Syndrome: A Randomized Clinical Trial. *Medical Journal of the Islamic Republic of Iran*. 2023; 37.