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Colloquium Vitae

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EFFECTS OF MYOFASCIAL RELEASE IN TEMPOROMANDIBULAR DYSFUNCTION

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ABSTRACT
The temporomandibular joint (TMJ), associated with factors that cause dental disharmony, such as wrong bites and stress, can affect the joint and progress to temporomandibular disorder (TMD). The objective was to evaluate the effects of manual techniques of myofascial release (LM) of the face and neck muscles in the quality of life and in the psychological conditions, during the beginning and end of the treatment. Participated in the study 15 participants, aged between 18 and 55 years, with signs and symptoms of TMD. The treatment consisted of LM associated with stretching and pomping techniques cervical, as well as health education. There was a significant reduction in the pain domain values and a significant increase in the SF-36 total score, indicating an improvement in quality of life. Regarding HADS, there were no significant changes.
Keywords: temporomandibular disorder, temporomandibular joint dysfunction syndrome, myofascial pain, trigger points, treatment.

EFEITOS DA LIBERAÇÃO MIOFASCIAL NA DISFUNÇÃO TEMPOROMANDIBULAR

RESUMO
A articulação temporomandibular (ATM), associada a fatores que causam desarmonia dentária, como mordidas erradas e estresse, podem afetar a articulação e evoluir para disfunção temporomandibular (DTM). O objetivo foi avaliar os efeitos das técnicas manuais de liberação miofascial (LM) dos músculos da face e pescoço na qualidade de vida e nas condições psicológicas, durante o início e término do tratamento. Participaram do estudo 15 participantes, com idade entre 18 e 55 anos, com sinais e sintomas de DTM. O tratamento consistiu em LM associado a técnicas de alongamento e pompagem cervical, além de educação em saúde. Houve redução significativa nos valores do domínio dor e aumento significativo no escore total do SF-36, indicando melhora na qualidade de vida. Em relação à HADS, não houve alterações significativas.
Palavras-chave: disfunção temporomandibular, síndrome da disfunção da articulação temporomandibular, dor miofascial, pontos-gatilho, tratamento.

INTRODUCTION

The temporomandibular joint (TMJ) is one of the most complex joints in the human body, together with the muscles, they perform important functional movements for phonetics and swallowing, so that the entire orofacial tract is harmonized. However, this joint is subject to overload, which can cause disharmony in the oral quadrants, affecting the entire masticatory structure, in which temporomandibular dysfunction (TMD) can develop, which will lead to malar bone and maxillary bone occlusion disorder, which causes inflammation in the joint. The fact that the TMJ has two joints (condyles) connected to the mandible requires that they work in sync between dental occlusion, neuromuscular balance and the joint itself[1].

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Several factors contribute to this dysfunction, among them, the disharmony of the dental arch under the pressure of wrong bites, such as, for example, patients who have the lack of a dental element, as well as the crossbite, deep, and the psychosomatics of stress[2] in day to day, which is considered a strong factor for the patient to develop bruxism, in which it generates compression of the teeth, causes greater overload on the joint and worsens the pathological condition[3].

Studies that evaluated the prevalence of TMD revealed that it can affect at least one symptom, between 50% and 75% of the world population, while 25% have associated symptoms, whose main complaint is orofacial pain[4,5], in addition to bringing typical signs and symptoms, such as fatigue, sensitivity, restriction of movement and clicking/crackling, promoting a biomechanical imbalance, can also present severe headaches, which radiate to the neck, causing greater tension in the entire region[6].

Professionals specialized in TMD use treatment resources that are effective in relieving joint pain, such as laser, acupuncture and ultrasound[7,8,9].The present study refers to myofascial release (LM) techniques, which consist of applying pressure to muscle trigger points in order to release the fascia, fibrous tissue that covers the muscles of the body, and increases circulation. area, reducing pain and spasm, among other benefits.

It has been shown to be very effective in the treatment of myofascial pain syndromes, which are neuromuscular alterations that mainly affect the cervical, shoulder girdle and lumbar regions[10,11]. The justificative of this study was the possible proof of the effectiveness of LM techniques associated with passive stretching and cervical pomping and a positive hypothesis is expected to improve quality of life and in the psychological conditions.

The objective was to evaluate the effects of manual techniques of myofascial release (LM) of the face and neck muscles in the quality of life and in the psychological conditions, during the beginning and end of the treatment.

METHODOLOGY

This research project was submitted and approved by the Research Ethics Committee (CEP) in compliance with resolution 466/12 (CAAE Protocol: 48385221.4.0000.5515) and Institutional Research Advisory Committee (CAPI) - 6989. Participants included in the study were instructed in in relation to all procedures used for the study, where those present signed the free and informed consent form agreeing to participate in the study.

This research was carried out in the city of Presidente Prudente - SP, Brazil, during the supervised orthopedic physiotherapy internship at the physiotherapy clinic - UNOESTE, between November 2021 and April 2022. The number of individuals recruited was 58 people, according to the equation previously described by John EnGC[12] assuming values of $p<0.05$, power=0.8, with $\sigma=2.725$ and D=20%[13], this number belongs to the minimum number of participants, and can be higher to compensate for possible dropouts. 64 individuals showed interest in participating in the research, however, only 19 participants attended the initial evaluation, of these, there were 4 dropouts during the treatment. Remaining a total of 15 individuals. Participants were recruited and evaluated through anamnesis. Individuals aged 18 to 55 years old[14], of both genders, with signs and symptoms of TMD, but not necessarily diagnosed with the disorder, were included in the study. Participants who did not attend the eight treatment sessions were excluded from the study.

Participants with signs and symptoms of TMD who were recruited through initial anamnesis were seen during the supervised orthopedic physiotherapy internship at the physiotherapy clinic – UNOESTE. Concomitantly, before starting the consultations, the Health Status Questionnaire – SF-36, and the Hospital Anxiety and Depression Scale – HADS.

Blinding was performed by the person responsible for data analysis, as the information provided during the completion of the questionnaires was delivered to the evaluator.

After this stage of evaluation of the participants, ten members, through a lottery, received the treatment first, through myofascial release associated with stretching and cervical pompagation techniques, while the other participants received health education, through self-explanatory texts and images about the dysfunction. After the end, the members were exchanged and the reverse was done, the group, which received the technique, at the time received health education. The consultations were carried out two to three times a week

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individually, with a one-month follow-up, totaling eight sessions.

The initial assessment was carried out at the beginning of the study through anamnesis, which included the collection of data such as: name, date of birth, age, sex, marital status, telephone number, address, weight, height, BMI (Body Mass Index) , race, medication use, signs and symptoms related to TMD, if you have any concomitant pathology and other diseases.

After recruiting the participants the Health Status Questionnaire - SF-36[14,15], and the Hospital Anxiety and Depression Scale – HADS[16,17] were evaluated.

The SF-36 assesses eight domains: functional capacity (FC), physical aspects (AF), pain, general health status (EGS), mental health (SM), emotional aspects (AE), social aspects (AS) and vitality (V)[14,15]. It was applied at the beginning and end of treatment. The score ranges from 0 to 100, that is, from the worst to the best quality of life state.

It emphasizes the individual's perception of their health in the last four weeks. Below is a description of what each domain intends to assess:

• Functional capacity: assesses how the individual performed their usual daily tasks (10 items present in question 3);
• Physical aspects: assesses how physical health interfered with usual domestic or professional activities (four items present in question 4);
• Pain: assesses how much pain the individual felt in the last four weeks and the limitations it caused in their daily lives (two items present in questions 7 and 8).
• General health status: assesses the individual's perception of their own health and their expectations for the future (five items present in questions 1 and 11);
• Vitality: assesses the individual's level of energy and willingness to perform their daily tasks (four items present in question 9);
• Social aspects: assesses how much the individual's usual social activities were affected by their physical or emotional state (two items present in questions 6 and 10);
• Emotional aspect: assesses how the emotional state interfered with daily activities at home or at work (three items present in question 5);
• Mental health: assesses how long the individual has been feeling anxious and depressed or happy and calm in their daily lives (five items present in question 9).

The HADS, will assess the level of anxiety and depression of individuals, has fourteen items, seven for anxiety (HADS-A) and seven for depression (HADS-D) and has a cutoff point of eight for anxiety and nine for depression. Each of its items scored from 0 to 3 points, with a maximum score of 21 points for each scale[16,17]. It was applied at the beginning and end of treatment.

For the intervention, part of the members who received the treatment first, meetings were held once, twice or three times a week, for a month, with a total of eight consultations, with the application of manual myofascial release techniques associated with passive stretching techniques. , held for 30 seconds of the cervical muscles, flexors, extensors and inclines, and cervical pomping, which consists of tensioning the segment, stretching to the limit of elasticity, and is noted for sensitivity, held for 20 seconds. Then, the rest of the group, which had not performed any type of intervention, only health education on TMD, also received treatment after the end of the eight sessions of the first part of the members.

The myofascial release techniques used were performed, so that myofascial trigger points were deactivated in the muscles through the releasing maneuver of the frontal, masseter, temporal, pterygoid, occipital muscles, without association of movement andsternocleidomastoid, scalene and trapezius upper fibers associated with cervical rotation and tilt movements[18].The entire service took around 20 minutes, with applications of 2 sets of 2 minutes of release of each muscle group,a rotation of the applied techniques was carried out to be consistent with the time of the session.

Data were analyzed using SPSS statistical software, version 22.0. For data normality analysis, the Shapiro Wilk test was applied. Paired analyzes were performed using Student's T tests in case of normal distribution or Wilcoxon test for variables that do not follow a Gaussian distribution. The significance level used was 5%.

RESULTS

A total of 15 participants started the evaluation process, of which 14 were female (93.3%), while 1 was male (6.7%). The characterization of the sample is described in Table 1.

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Table 1. Sample characterization (n=15).

Variables	Mean ± Standard Deviation
Age	26.53 ± 11.09
Weight (kg)	76.64 ± 19.38
Height (m)	1.65 ± 0.06
BMI (kg/m²)	27.92 ± 6.38

*: kg: kilogram; m: meters; BMI: Body Mass Index.

Among the BMI classification, the highest prevalence was with normal BMI (40%), followed by obesity (26.67%), and overweight (26.67%) and the lowest rate was severe obesity (6.66%). , shown in Figure 1.

During the evaluation, questionnaires were completed, including the SF-36 divided into 8 domains. Table 2 shows a significant reduction in the values in the pain domain and a significant increase in the total score of the questionnaire at the end of the intervention, indicating an improvement in quality of life.

Regarding the hospital anxiety and depression scale, there were no significant changes at the end of the intervention (Figure 2).

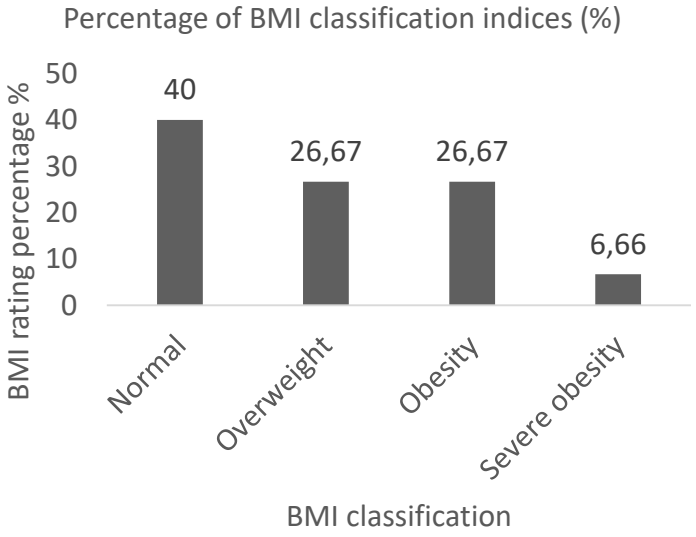

Figure 1. Percentage of BMI classification indices (n=15)

Table 2. Scores obtained in each domain before and after the SF-36 in quality of life (n=15).

Variáveis	Média ± Desvio padrão		p
	ANTES	DEPOIS	
Functional Capacity	26,27±4,67	27,33±4,42	0,1782
Physical Aspects	6,00±1,41	6,47±1,55	0,2353
Emotional Aspects	4,20±1,21	4,53±1,30	0,3712
Social Aspects	6,73±1,03	6,20±0,77	0,1038
Pain	6,67±1,63	5,13±2,00	0,0047*
Mental Health	18,33±1,84	18,40±2,06	0,9255
Vitality	13,07±1,83	14,07±2,58	0,2931
General Health Status	14,80±2,46	13,80±3,10	0,1772
Total Score	99,29±17,03	108,33±19,05	0,0160*

*: p<0,05.

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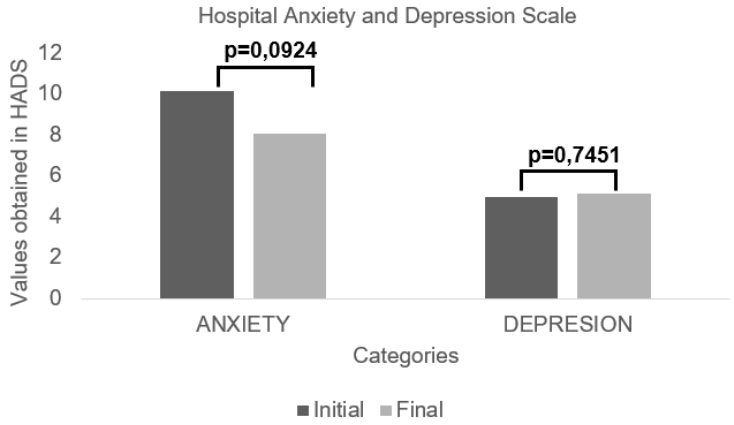

Figure 2. Comparison of anxiety and depression levels at the beginning and end of the intervention

DISCUSSION

This study evaluated the effects of eight sessions of manual LM techniques applied to the muscles of the face and neck, on quality of life, anxiety and depression in patients with TMD. The intervention proved to be effective on quality of life improved statistically ($p<0.0160$), as there was an increase of 9.04 points in the total score after the eight weeks of intervention. Although there were no changes in anxiety and depression scores.

The American Academy of Orofacial Pain recommends some treatments for TMDs, which may involve the use of intraoral appliances, behavioral techniques, patient education for a healthy lifestyle, relaxation techniques, pharmacotherapy and physical therapy[19]. As early as 1979, evidence showed that conservative interventions can improve symptoms in up to 90% of patients with TMD[20]. Thus, as listed in this study, physical therapy provides an improvement in quality of life, as there was an improvement in the symptoms of TMD.

The main objective of physiotherapy in TMD's is to promote muscle relaxation and harmonization of muscle activity for proper joint functioning. It is known that there are several physiotherapeutic treatments indicated for patients with TMD, among them are strengthening exercises, joint mobilization, deep tissue massage, ischemic compression, ultrasonic vibration, thermotherapy, needling, low-intensity laser therapy and myofascial release[21]. In parallel with this study, there is also evidence that proves the effectiveness of LM to promote muscle relaxation, consequently, there is an improvement in quality of life.

Manual therapies, in particular, provide improved perfusion and range of motion. LM applied to the TMJ is a passive maneuver that, through the therapist's palpation, converts the contrition into soft tissue laxity[19]. In the clinical study by Kuć J et al[22] that included 50 patients with myofascial pain, soft tissue mobilization performed three times for 30 minutes at trigger points in the masseter and temporal muscles with myofascial relaxation, reduced muscle activity was observed (by electromyography) . Concomitant to this study, it was also found that muscle relaxation provided an improvement in quality of life.

As a result of the severe pain, evidence indicates that patients with TMD have a worse quality of life. The study by Trize DM et al[23], with 102 patients aged between 19 and 86 years who had TMD, revealed that the quality of life has a great impact on patients with TMD, mainly due to the presence of pain. Also, a systematic review that analyzed 12 articles pointed out a relationship between the presence of TMD and a worse quality of life, evidencing the psychological damages in addition to the physical ones caused by the disorder[24]. Also evidenced through this study, that the TMD symptomatology progresses to a worse quality of life.

The total score of the SF-36 questionnaire also improved after the intervention. The findings of the randomized clinical study carried out by Gesslbauer C et al[25] also point in this direction. The researchers included 40 women with long-term TMD (more than three months) and observed a reduction in the SF-36 pain domain after manipulative interventions[25], which was also observed in this study, with the reduction of the pain domain.

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Regarding the assessment of the HADS scale, the participants of the present study presented, on average, initial and final values of 10 and 8 for anxiety and 5 and 5 for depression, respectively. Although no statistically significant changes were identified, according to the study by Soares[26] that selected 100 university students aged over 18 years, there was a statistically significant difference in anxiety and depression symptoms, as they interfered with TMD symptoms.

Finally, in addition to specific treatments, a healthy lifestyle that encompasses physical activity, balanced diet, good hydration and quality sleep can help maintain an anti-inflammatory body, and consequently balance in physical and mental health. Both the patient and the professionals involved must understand that the treatment for TMD must be given comprehensively, as it is a complex and multifactorial disorder[27].

The limitation of this study is the absence of a control group to compare the effect of the intervention. Thus, we suggest future research that investigates larger samples with intervention groups and control groups to observe the real effectiveness of LM therapy in TMD.

CONFLICT OF INTEREST

This study has no conflict of interest.

CONCLUSION

The LM technique confirmed the hypothesis and acted to reduce acute pain in patients with TMD, with to improve the pain domain and, improving the quality of life in the SF-36 total score, because there were significant differences, however, it does not have statistical changes for the reduction of anxiety and depression. Furthermore, despite the differences being significant, they were smaller than the standard deviation, which demonstrates a non-clinically significant difference for the two outcomes analyzed.

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