

Effectiveness of Counseling on Chronic Pain Management in Patients with Temporomandibular Disorders

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Aims: To evaluate the effectiveness of counseling on pain intensity and oral health-related quality of life (OHRQoL) in temporomandibular disorders (TMD) patients. **Methods:** Fifty female patients diagnosed with TMD were divided into two groups: a group of waiting list patients (control group) and a group of patients who received counseling therapy (experimental group) involving education about etiologic factors, avoidance of parafunctional habits, and sleep, as well as dietary advice. All patients were evaluated at baseline and 7, 15, 30, and 60 days later. Patients reported pain intensity using a visual analog scale (VAS), and the Oral Health Impact Profile (OHIP-14) was used to assess the impact of pain on OHRQoL. Statistical analyses were performed using the split-plot analysis of variance (SPANOVA) design, with post hoc Student *t* tests for independent samples and for dependent samples, adopting a significance level of $P < .05$. **Results:** The control group consisted of 24 female patients with a mean age of 39.96 ± 13.93 years, and the experimental group consisted of 26 female patients with a mean age of 35.15 ± 10.78 years. Counseling was considered effective for reducing pain intensity, with a significant improvement observed at 7 days ($P < .001$). Counseling was also responsible for a significant improvement in the impact of TMD on OHRQoL at all follow-up time points analyzed ($P < .001$). When comparing the groups, a significant difference was observed for both pain intensity and TMD impact on OHRQoL during follow-up ($P < .05$). **Conclusion:** Counseling seems to significantly improve pain and OHRQoL in patients. *J Oral Facial Pain Headache* 2020;34:77–82. doi: 10.11607/ofph.2163

Keywords: counseling, OHRQoL, orofacial pain, self-care, temporomandibular disorder

The etiology of temporomandibular disorders (TMDs) is multifactorial and may be associated with factors such as postural imbalance, parafunctional oral habits, and psychosocial and behavioral changes.¹ Considering these factors and the different oral structures that can be affected (eg, muscles, joints), the treatment of TMD cannot be standardized. Many treatment options are reported in the literature, including occlusal adjustment, temporomandibular joint (TMJ) surgery, and others; however, invasive therapies can promote irreversible changes. Therefore, conservative methods, such as counseling and interocclusal splint and physical therapies, are preferable to invasive therapies, since they usually result in satisfactory clinical outcomes in TMD patients.^{2,3}

Counseling and self-care are simple, easy-to-understand therapeutic strategies that are directly related to the respective diagnosis and allow the patient autonomy in the control and execution of the procedures performed.⁴ These therapies consist of patient education concerning the etiologic causes of pain and provide support regarding postural and behavioral habits.⁵ In addition, this therapy involves both the patient and the dental professional clarifying differential diagnoses, which can in turn reduce fear, stress, and anxiety.⁴

Counseling aims to facilitate the adaptation of the patients to their condition, improving their personal resources for self-knowledge, self-care, and autonomy.⁶ As a result, counseling seeks to provide elements of personal training and improvement, allowing the subjects to change attitudes, behavior, and the perception of their problem.²

Table 1 Components of Counseling Therapy

Education	Information about the benign course of TMD and possible etiologic factors, both behavioral (habits, posture) and emotional (stress, anxiety).
Postural position of the mandible	Limited mouth opening. Avoid excessive mandibular movement. Maintain a good posture of the head and neck.
Nutrition	Progressively increase food consistency. Avoid foods that seem difficult to chew.
Parafunctional habits	Avoid any parafunctional habits. Avoid chewing gum, biting nails. Try not to grind, gnash, or clench teeth.
Pain and tension	Practicing physical exercises such as walking, running, or weight training can play a role in pain and tension relief.
Sleep quality	Keep a regular sleep schedule, keep the temperature and lighting of the room pleasant, and avoid drinking alcohol or coffee before sleeping.

In a systematic review published in 2013, Freitas et al⁶ found that counseling was able to improve muscle palpation tenderness and maximum mouth opening, with results similar to those of interocclusal splints. Despite this, there are a lack of controlled clinical trials in this field and the methodologies applied vary, which makes comparison of these results difficult. Thus, the objective of this study was to evaluate the effectiveness of counseling as a TMD treatment for improving pain intensity and impact of TMD on oral health-related quality of life (OHRQoL).

Materials and Methods

A controlled clinical trial was conducted at the Department of Dentistry of the Federal University of Rio Grande do Norte (UFRN). This study was approved by the local Ethics Committee, and all individuals recruited signed a consent form. The sample consisted of 50 patients divided into two groups: control (G1) and experimental (G2).

The sample size was calculated based on the results of a previous study⁷ in which TMJ and muscular pain intensity were evaluated in patients who received orofacial myofunctional therapy (OMT) and control patients. OMT is similar to counseling treatment and involves education, self-exercise therapy, and avoidance of parafunctional behavior. In the OMT group, the initial TMJ pain intensity on a 100-mm visual analog scale (VAS) was 19.9, and the final intensity was 8.6 (improvement of 56.78%); for the control group, the initial TMJ pain intensity was 13.3, and the final was 12.1 (improvement of 9.02%). A two-tailed hypothesis test with a significance level of 5% and a power test of 90% were performed, and a sample size of 18 individ-

uals for each group was calculated. A similar analysis was performed considering muscular pain intensity and revealed a need for 23 patients per group.

For the inclusion criteria, patients were required to be women and to present a positive diagnosis for TMD according to the Brazilian version of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD)⁸ Axis I; report a duration of orofacial pain for at least 6 months; and report moderate pain intensity at baseline (> 40 mm on a 100-mm VAS). Exclusion criteria were ongoing TMD treatment; ongoing orthodontic treatment; daily use of analgesics, antidepressants, or a muscle relaxant; and history of radiation therapy in the head and neck regions. None of the patients were under analgesic treatment; however, some used it sporadically.

The RDC/TMD was applied by a single trained and calibrated examiner at baseline and at 60 days of follow-up (R.F.). The intensity of spontaneous muscle pain was evaluated using a 100-mm VAS at baseline (T_0) and 7, 15, 30, and 60 days later (T_7 , T_{15} , T_{30} , and T_{60} , respectively). The impact of TMD on OHRQoL was evaluated using the Brazilian version of the Oral Health Impact Profile (OHIP-14)⁹ at T_0 and at T_{30} and T_{60} .

All patients in the experimental group (G2) received counseling therapy by means of verbal and written instructions from a single trained examiner (A.P.). The aim of this therapy was to educate the patient about their condition and possible etiologic factors; for this purpose, patients were informed about the structures involved, the possible causes, and the benign prognosis of TMD. They were also trained about the postural rest position of the mandible and instructed about nutrition and the avoidance of parafunctional habits and excessive mandibular movement. Instructions on techniques to relieve pain and tension (eg, practicing physical exercises such as walking, running, or weight training) and recommendations for improving sleep quality (eg, keeping a regular sleep schedule, keeping the temperature and lighting of the room pleasant, not drinking alcohol or coffee before sleeping) were also given (Table 1). At T_7 , T_{15} , T_{30} , and T_{60} , these instructions were reinforced, and patients were asked about habits related to the initiation and/or maintenance of pain.

The patients who were not included in the treatment group were added to a waiting list and were invited to participate in the control group (G1), which consisted of patients diagnosed with TMD according to the RDC/TMD (according to the inclusion criteria). Patients were evaluated at baseline and received the VAS and OHIP-14 inventory at T_7 , T_{15} , and T_{30} . During follow-up, authors contacted patients to request that the questionnaires were filled in. At T_{60} , patients were evaluated, presented their filled-in questionnaires,

Table 2 General Characteristics of the Sample

Variables	Group		Total	P value
	Control	Counseling		
Age (y)	39.96 (13.93)	35.15 (10.78)	36.46 (12.50)	.177
Pain duration (mo)	42.66 (15.77)	44 (32.55)	43.36 (25.64)	.355
VAS baseline (cm)	7.13 (1.89)	6.88 (1.81)	7 (1.84)	.649
OHRP-14 baseline (score)	14.26 (4.30)	12.57 (5.66)	13.38 (5.07)	.243

Values expressed as mean (standard deviation). Student *t* test for independent samples was used. Significance was set at $P < .05$.

and their treatment was begun. If any patient was enrolled for TMD treatment, they were automatically removed from the study.

Data were analyzed using SPSS software, version 20.0 for Windows. Due to the assumption of a normal distribution (Mauchly sphericity test: $P = .468$; homogeneity according to Box M: $P = .01$), split-plot analysis of variance (SPANOVA) test was performed. Student *t* tests for independent samples and for dependent samples were performed as post hoc tests. Pearson correlation and linear regression analyses were also performed to evaluate correlations between pain intensity and OHRQoL at T_{30} and T_{60} . All results were considered significant at $P < .05$, providing a confidence index of at least 95%.

Results

The sample consisted of 50 TMD patients, 24 allocated to G1 and 26 to G2. During the study period, 6 participants from G1 and 3 from G2 failed to attend at least one of the follow-up sessions and were therefore excluded from the statistical analyses. At the end of 60 days, 18 patients had completed the treatment for G1 (representing a response rate of 75%), and 23 had completed the treatment for G2 (representing a response rate of 88.5%).

The power of the sample was calculated using difference in means in the OpenEpi program. For pain intensity, the power of the sample was 99.95%, and for the impact of TMD on OHRQoL, the sample power was 100%.

Patients' ages ranged from 17 to 70 years, with a mean of 37.46 ± 12.50 years. With regard to diagnosis, 9 (18%) patients presented muscular TMD (Group I of RDC/TMD), 5 (10%) in G1 and 4 (8%) in G2. Three (6%) had joint disorders (Groups II and/or III of RDC/TMD), one (2%) in G1 and two (4%) in G2. Mixed TMD (Group I and Groups II and/or III of RDC/TMD) was diagnosed in 38 (76%) patients, 18 (36%) of which were in G1 and 20 (40%) in G2. Table 2 shows the comparisons between the groups for the variables age, average duration of pain, initial pain intensity, and initial OHRQoL. There were no

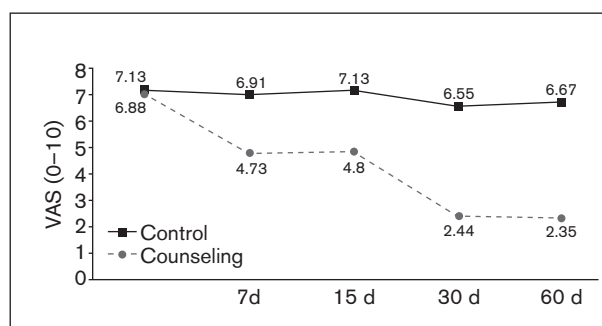


Fig 1 Evolution of pain intensity (cm) over time for both groups. VAS = visual analog scale.

Table 3 Comparisons of Patient Pain Intensity

Time/group	n	Mean (SD), cm	P value
T ₀			
Control	24	7.13 (1.89)	.649
Counseling	26	6.88 (1.81)	
T ₇			
Control	23	6.91 (1.62)	.001
Counseling	26	4.73 (2.52)	
T ₁₅			
Control	23	7.13 (1.63)	.001
Counseling	25	4.80 (2.55)	
T ₃₀			
Control	22	6.55 (2.68)	< .001
Counseling	25	2.44 (2.34)	
T ₆₀			
Control	18	6.67 (2.19)	< .001
Counseling	23	2.35 (3.11)	

Student *t* test for independent samples. Significance was set at $P < .05$.

significant differences between the groups according to the Student *t* test.

The SPANOVA test assessed the evolution of pain intensity for both groups during T_0 , T_7 , T_{15} , T_{30} , and T_{60} . A significant relationship between type of treatment and time was observed ($F_{4,152} = 7.90$, $P < .001$). There was also a significant effect of time ($F_{4,152} = 11.50$, $P < .001$). Figure 1 shows the evolution of pain intensity over time for both groups. Table 3 shows the comparison of pain intensity between the groups during the study.

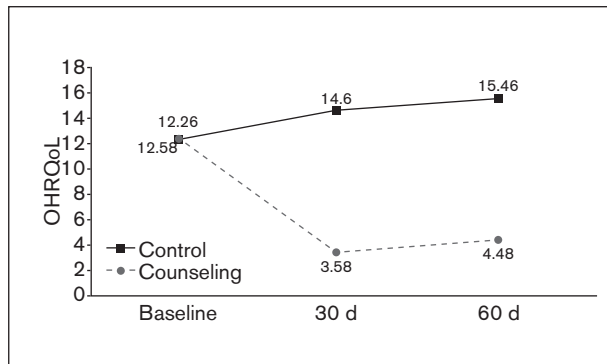


Fig 2 Evolution of impact on OHRQoL (mean score on OHIP-14) over time for both groups.

Table 4 Comparisons of Patients' Oral Health-Related Quality of Life

Time/group	n	Mean (SD), points	P value
T ₀			
Control	24	12.26 (4.30)	.243
Counseling	26	12.58 (5.66)	
T ₃₀			
Control	22	14.60 (5.05)	< .001
Counseling	24	3.58 (3.20)	
T ₆₀			
Control	18	15.46 (5.61)	< .001
Counseling	23	4.48 (5.07)	

Student *t* test for independent samples. Significance was set at $P < .05$.

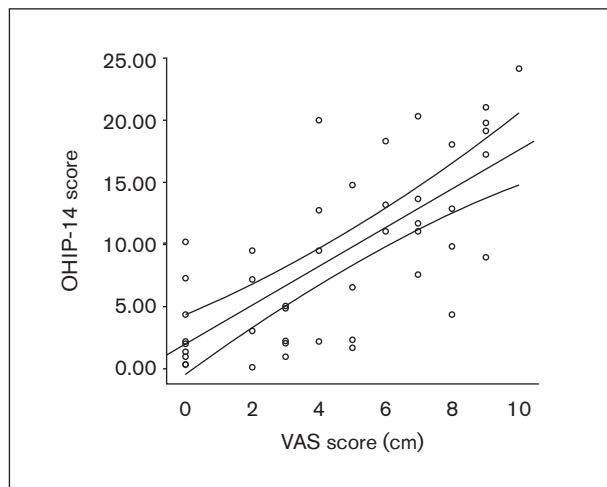


Fig 3 Scatterplot considering visual analog scale (VAS) and OHIP-14 scores at 30 days of follow-up. Equation: $OHIP_{30} = 1.83 + 1.57 VAS_{30}$. $R^2 = 0.528$.

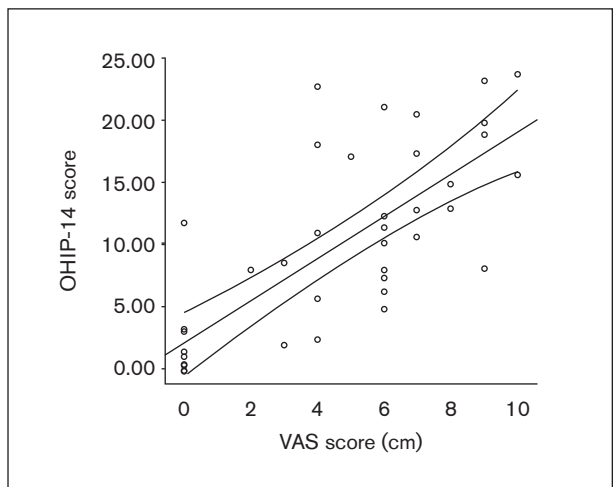


Fig 4 Scatterplot considering VAS and OHIP at 60 days of follow-up. Equation: $OHIP_{60} = 2.08 + 1.71 VAS_{60}$. $R^2 = 0.586$.

Table 5 RDC/TMD Diagnoses in Both Groups

Diagnosis	Baseline, n (%)	T ₆₀ , n (%)
Control		
Without TMD	0	0
Muscular	5 (20.8)	5 (27.8)
Articular	1 (4.2)	0
Mixed	18 (75)	13 (72.2)
Counseling		
Without TMD	0	7 (31.8)
Muscular	4 (15.4)	4 (18.2)
Articular	2 (7.7)	2 (9.1)
Mixed	20 (76.9)	9 (40.9)

The SPANOVA test assessed the evolution of OHRQoL and showed a significant relationship between treatment and time ($F_{2,74} = 25.73$, $P < .001$). A significant effect of time ($F_{2,74} = 17.40$, $P < .001$) was also observed. Figure 2 shows the evolution of OHRQoL over time for both groups. The analysis of the OHRQoL between groups was performed using the *t* test for independent samples, and significant differences were observed at T₃₀ and T₆₀ (Table 4).

The RDC/TMD re-administered at T₆₀ showed that all patients in G1 presented TMD, whereas 7 (31.8%) patients in G2 were diagnosed as not having TMD. The comparison of the RDC/TMD results at baseline and T₆₀ revealed that 13 (72.22%) patients in G1 and 9 (40.9%) in G2 remained stable, while an improvement in TMD was observed in 2 (11.11%) patients in G1 and in 6 (27.7%) patients in G2. Only three (16.66%) patients presented worsening of TMD, all in G1. Table 5 shows the data concerning TMD diagnosis.

Linear regression analysis showed a highly significant correlation between variables at T₃₀ ($F = 0.727$, $P < .005$), with $R^2 = 0.528$, indicating that 52.8% of OHRQoL changes could be explained by pain intensity (Fig 3). Figure 4 shows the analysis performed at T₆₀ of follow-up, when a highly significant correlation was also observed ($F = 0.766$, $P < .005$), with $R^2 = 0.586$, indicating that 58.6% of OHRQoL changes could be explained by pain intensity. The residual analysis suggested that the model was appropriate for the data.

Discussion

The present clinical trial was conducted to evaluate the effectiveness of counseling as a treatment option for TMD. Pain intensity and the impact of TMD on OHRQoL were compared between TMD patients treated with counseling and waiting list patients. Results showed that counseling was effective for controlling the signs and symptoms of TMD and for improving OHRQoL over the short (7 days) and intermediate (60 days) terms.

The use of a control group who did not receive intervention minimizes the possibility that any spontaneous improvement in symptoms in some patients could be considered to be the result of the treatment. Some authors affirm that changes in the signs and symptoms of TMD could reflect the fluctuation or the natural course of the disease.⁷ In 1992, Whitney and von Korff¹⁰ stated that when patients seek treatment for pain, improvement might be due to three types of effect: a specific effect of treatment, a placebo effect, or regression to the mean. However, in this study, the control group of patients did not experience a reduction in pain intensity or improvement in OHRQoL during the study time. However, it is not possible to say whether these findings would continue for an extended period.

The pain intensity of the G2 patients significantly decreased during the study follow-up period, while no improvement occurred in G1, suggesting that counseling was effective in reducing the pain intensity of TMD patients. These results corroborate those of previous studies^{3,11,12}; however, these studies compared counseling and other therapy options and/or studied their associations.

The effectiveness of counseling on TMD may result from the effect of this method on positive behaviors, as well as on psychologic domains.¹¹ This is especially important considering that TMD etiology is multifactorial and that biopsychosocial factors cannot be dissociated from the disorder and should be considered during the management of TMD signs and symptoms. Some authors also suggest that counseling may affect pain modulation.^{11,13}

The assessment of the impact of TMD on OHRQoL demonstrated that the untreated patients experienced a progressive worsening in their OHRQoL. On the other hand, patients undergoing counseling demonstrated a significant improvement in their OHIP-14 scores during follow-up. These results suggest that counseling can play an important role in improving patients' OHRQoL; however, there is no scientific evidence supporting this finding, as no study in the literature has evaluated the effectiveness of counseling from the perspective of quality of life.

In 2017, Bayat et al¹⁴ carried out a case-control study to assess the quality of life of patients with and without TMD. According to logistic regression, the authors observed that pain intensity and psychosocial impairment were the most important predictors of quality of life and concluded that promoting the quality of life of TMD patients requires emphasis on chronic pain management and maintaining good mental health.

Despite the various studies that have evaluated the effect of counseling on TMD signs and symptoms, the diversity of methodologies and terminologies cited as counseling programs makes a comparison among the findings difficult. Accordingly, in 2015, 11 experts were invited to participate in a Delphi process to reach a consensus on the definition—as well as to develop a standardized self-management program—for TMD treatment in order to allow the comparison of results in future research studies and thus to advance the evidence of this treatment modality. As a result of this process, the main concepts of counseling and the elements for clinical practice were established (education; self-exercise; self-massage; thermal therapy; dietary and nutritional counseling; and identification of parafunctional behaviors).⁴ The counseling program used in the current study is very similar to that developed by this process and has been shown to be effective in reducing the signs and symptoms of TMD.

Thus, counseling can be considered to be a low-cost, easy-to-use therapy with positive effects on reducing pain intensity and improving OHRQoL. Clinicians should consider the use of short- or long-term counseling, starting the treatment with shorter intervals (7 to 15 days) as used in this research study, and noting the need for other intervention modalities for refractory patients. However, more clinical trials comparing parameters in groups of patients receiving counseling to those of a control group are needed.

Conclusions

Considering the sample evaluated and the methodology applied, these results allow the conclusion that counseling was effective in the treatment of TMD, producing significant improvements in pain intensity and OHRQoL.

Acknowledgments

The authors report no conflicts of interest.

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