ORIGINAL ARTICLE

Influence of temporomandibular disorder presence and severity on oral health-related quality of life*

Influência da presença e gravidade da disfunção temporomandibular na qualidade de vida relacionada com a saúde oral

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ABSTRACT

BACKGROUND AND OBJECTIVES: Temporomandibular disorders are highly prevalent and may impair several oral function-related aspects. This study aimed at evaluating the impact of the presence and severity of temporomandibular disorder signs and symptoms on oral health-related quality of life.

METHODS:Participated in the study 135 dentistry students of the Federal University of Paraiba. The presence of temporomandibular disorder was determined by means of an anamnesis questionnaire and a summarized clinical evaluation protocol. Oral health-related quality of life was determined by the summarized Oral Health Impact Profile version translated and validated for the Portuguese language. Statistical comparisons between Oral Health Impact Profile-14 means related to the presence of temporomandibular disorder signs and symptoms were achieved with Mann-Whitney and Kruskal-Wallis tests.

RESULTS: Volunteers with temporomandibular disorder (p<0.001), needing treatment (p<0.001) and higher severity (p<0.001) had higher impact on oral health-related quality of life. Volunteers with clinical temporomandibular disorder signs had further quality of life impairment, being that individuals with simultaneous muscle and joint temporomandibular disorders (p=0.034) had higher Oral Health Impact Profile-14 scores. Most impaired domains were physical pain (p=0.045), functional limitation (p=0.007) and psychological discomfort (p=0.045).

CONCLUSION: Temporomandibular disorder severity has negative impact on quality of life, especially in volunteers with simultaneous joint and muscle clinical signs.

Keywords: Pain, Quality of life, Temporomandibular joint disorders.

RESUMO

JUSTIFICATIVA E OBJETIVOS: As disfunções temporomandibulares são altamente prevalentes e podem comprometer diversos aspectos relacionados à função oral. O objetivo deste estudo foi avaliar o impacto da presença e gravidade dos sinais e sintomas de disfunção temporomandibular na qualidade de vida relacionada com a saúde oral.

MÉTODOS: Cento e trinta e cinco estudantes de odontologia da Universidade Federal da Paraíba foram avaliados. A presença de disfunção temporomandibular foi determinada por meio de questionário anamnésico e por um protocolo resumido de avaliação clínica. A qualidade de vida relacionada com a saúde oral foi determinada por meio da versão resumida do *Oral Health Impact Profile*em sua versão traduzida e validada para o português. Comparações estatísticas entre as médias do *Oral Health Impact Profile*-14 relacionadas à presença de sinais e sintomas de disfunções temporomandibulares foram realizadas por meio dos testes de Mann-Whitney e Kruskal-Wallis.

RESULTADOS: Os voluntários com disfunção temporomandibular (p<0,001), necessidade de tratamento (p<0,001) e maior gravidade (p<0,001) exibiram maior impacto na qualidade de vida relacionada com a saúde oral. Os voluntários com sinais clínicos de disfunção temporomandibular apresentaram maior comprometimento da qualidade de vida, sendo que os indivíduos com sinais de disfunção temporomandibular muscular e articular simultaneamente (p=0,034) apresentaram os maiores escores do *Oral Health Impact Profile*-14. Os domínios mais comprometidos foram dor física (p=0,045), limitação funcional (p=0,007) e desconforto psicológico (p=0,045).

CONCLUSÃO: A gravidade da disfunção temporomandibular representa impacto negativo na qualidade de vida, especialmente em voluntários com sinais clínicos articulares e musculares simultâneos.

Descritores: Dor, Qualidade de vida, Transtornos da articulação temporomandibular.

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INTRODUCTION

Temporomandibular disorder (TMD) is a generic term for a series of clinical signs and symptoms involving masticatory muscles, temporomandibular joints (TMJ) and associated structures[1].

Most frequently reported symptom is pain, located in masticatory muscles and/or pre-auricular region, being exacerbated by chewing or other jaw activity[2]. Other symptoms may also be present, such as jaw movement limitation or asymmetry, joint noises, painless masticatory muscles hypertrophy, muscle fatigue and abnormal occlusal wear associated to parafunctions such as bruxism[2-4].

Due to this wide variety of signs and symptoms, TMD patients may have severe physical and mental impairment with clinical features common to other types of chronic diseases and negative impact on quality of life (QL)[5].

Some authors, using subjective health indicators, have shown that TMD has a major impact on QL[6,7]. However, the relationship among this impact, severity and different types of TMD has not yet been fully explored.

The concept of oral health-related QL offers a major opportunity to synthesize a variety of possible psychosocial impacts related to some oral diseases, being possible to characterize TMD psychosocial load and compare such impact among its specific diagnoses[8,9].

One of the most widely used tool to measure oral health-related QL is the Oral Health Impact Profile (OHIP). The original questionnaire, with 49 items, and its reduced version with 14 items (OHIP-14) have seven domains of impact: functional limitation, physical pain, psychological discomfort, physical incapacity, psychological incapacity, social incapacity and disability, allowing its application for the diagnosis of the impact of different oral conditions, including TMDs[10,11].

Its reduced version, OHIP-14, distinguishes the seven oral heal domains using two items for each domain. OHIP-14 has shown excellent psychometric properties being a valid, reproducible and consistent tool[11].

This study aimed at evaluating the impact of TMD presence and signs and symptoms severity on oral health-related quality of life, using OHIP-14.

METHODS

Participated in the study 135 volunteers, students of the dentistry course, UFPB, aged from 18 to 25 years, being 58 males and 77 females, from September 2011 to May 2012.

Exclusion criteria were: two or more lost teeth (except third molars); use of removable prosthesis; participants who at the moment of the study were using appliances, participants being treated for TMD or other acute and chronic orofacial pain.

TMD classification

An adapted anamnesic questionnaire[12] with questions related to TMD symptoms was used to evaluate TMD presence and severity.

The questionnaire is made up of 10 questions, each one with three possible answers: "yes", "no" or "sometimes", which have received the following scores, respectively: "10", "0" and "5". The sum of scores attributed to answers was compared to the DMF anamnesic index[12], which allows the classification of the population according to the degree of TMD, according to total scores obtained, being established scores of 0-15 (no TMD), 20-40 (mild TMD), 45-65 (moderate TMD) and 70-100 (severe TMD). Anamnesic index data also allow the classification of the sample in two additional groups: volunteers "with no need for treatment" (no TMD and mild TMD) and "needing treatment" (moderate and severe TMD)[12].

Volunteers were also submitted to a summarized clinical TMD evaluation protocol, recorded in adequate card. The exam was performed in the Occlusion clinic, Department of Restorative Dentistry (DOR), UFPB, by a single trained examiner experienced in the area.

The presence of clinical signs allowed the classification of TMD according to the following criteria:

- Muscle TMD signs: two or more muscle pain areas;
- Joint sensitivity: one or more joint pain areas;
- Jaw movement changes: one or more jaw movement change (opening restriction, hypermotility, deviations and deflection);
- Joint sounds: one or more joint sounds areas (clicking and crackle);
- Joint TMD signs: two or more areas with TMJ deviations of normality (joint pain, jaw noises or altered movements).

Evaluation of oral health-related quality of life

Oral health-related QL was estimated by the OHIP in its reduced version validated for the Portuguese language (OHIP-14)[13,14]. The questionnaire is made up of 14 questions with five possible answers: never, seldom, sometimes, repeatedly and always, respectively scored as zero, one, two, three and four. All ordinal answers are added up to produce a total OHIP-14 score, which may vary from zero to 56, with higher scores meaning more negative impact on oral health[13,14].

OHIP-14 distinguishes seven oral health domains, using two items for each domain. Items are organized according to a hierarchical model for the domains, which go from functional limitation to disability. Scores for each one of the seven OHIP-14 domains may vary from zero to eight, with higher scores meaning more severe impairment[13].

Statistical analysis

Data were analyzed by the program Statistical Package for Social Sciences (SPSS) version 17.

Kolmogorov-Smirnov normality test has shown that OHIP-14 scores had no normal distribution, so non-parametric Mann-Whitney and Kruskal-Wallis tests were used to compare OHIP-14 means related to TMD signs and symptoms.

In both statistical tests, significance level was 95% with p<0.05 indicating significant statistical difference.
This study was approved by the Council of the Ethics Committee for Research with Human Beings, Teaching Hospital Lauro Wanderley, Federal University of Paraíba (UFPB) under protocol 149/2011.

RESULTS

The group of TMD individuals had mean OHIP-14 score statistically higher as compared to the group with no TMD (DMF index) (p<0.001) (Table 1).

Table 1. Statistical comparisons between Oral Health Impact Profile-14 means related to the presence and severity of the temporomandibular disorder. João Pessoa/PB

TMD classification (Anamnesic questionnaire)	OHIP-14 mean ± SD	p value
Presence of TMD		
Absent	3.91±4.431	<0.001*
Present	8.99±7.739	
Need for treatment		
Absent	6.24±6.663	<0.001*
Present	13.20±7.430	
TMD degree		
No TMD	3.91±4.431	0.016**
Mild TMD	7.26±7.225	
Moderate TMD	11.52±7.292	<0.001**
Severe TMD	18.71±5.057	<0.001**

TMD = temporomandibular disorder; SD = standard deviation.
*Statistically significant (p<0.05) (Mann-Whitney Test). ** Statistically significant (p<0.05) (Kruskal-Wallis Test).

Individuals needing treatment according to DMF index had higher OHIP-14 scores as compared to individuals not needing treatment (p<0.001) (Table 1).
Individuals with mild, moderate and severe TMD had OHIP-14 scores statistically higher as compared to the group with no TMD and the highest the TMD severity level, the highest the impact on oral health-related QL (Table 1).
Individuals with some clinical TMD sign had higher OHIP-14 scores as compared to individuals with no TMD sign. A higher QL impact was observed in the group with signs of both muscle and joint TMD, followed by the group with muscle signs, however only the former was statistically significant (p=0.034) (Table 2).
As observed in table 2, groups with some clinical TMD sign had higher scores in all evaluated domains, except for disability in the group with muscle TMD signs. However, only functional limitation (p=0.045) for the groups with muscle TMD signs, and physical pain (p=0.007) and psychological discomfort (p=0.045) for the groups with muscle and joint TMD signs, were statistically significant.

DISCUSSION

TMD patients have reported considerable painful symptoms, in joints or muscles, in addition to a large number of signs and symptoms which possibly may influence individual and psychosomatic characteristics, decreasing patients' QL[8,15,16].
In our study, TMD individuals had higher oral health-related QL impact, as compared to individuals with no TMD.

Table 2. Statistical comparisons between Oral Health Impact Profile-14 means and its domains related to the presence of clinical TMD signs (physical evaluation). João Pessoa/PB

Quality of life	Clinical TMD signs											
	Muscle signs				Joint signs				Muscle and joint signs			
	A/P	M	±SD	p	A/P	M	±SD	p	A/P	M	±SD	p value
OHIP general	P	8.81	±7.765	0.182	P	8.48	±8.591	0.247	P	10.30	±6.677	0.034*
	A	5.66	±5.944		A	5.66	±5.944		A	5.66	±5.944	
OHIP-1	P	0.81	±1.377	0.045*	P	0.41	±1.045	0.140	P	0.22	±0.518	0.224
	A	0.30	±0.814		A	0.30	±0.814		A	0.30	±0.814	
OHIP-2	P	1.13	±1.408	0.156	P	1.04	±1.282	0.114	P	1.78	±1.594	0.007*
	A	0.54	±0.838		A	0.54	±0.838		A	0.54	±0.838	
OHIP-3	P	2.44	±2.065	0.436	P	2.78	±2.449	0.326	P	3.65	±2.405	0.045*
	A	2.04	±1.840		A	2.04	±1.840		A	2.04	±1.840	
OHIP-4	P	1.13	±1.586	0.076	P	0.70	±1.314	0.177	P	1.00	±1.314	0.105
	A	0.46	±1.182		A	0.46	±1.182		A	0.46	±1.182	
OHIP-5	P	1.38	±1.544	0.197	P	1.50	±1.871	0.246	P	1.65	±1.584	0.161
	A	0.94	±1.284		A	0.94	±1.284		A	0.94	±1.284	
OHIP-6	P	1.44	±1.548	0.383	P	1.52	±1.786	0.509	P	1.65	±1.402	0.342
	A	1.02	±1.301		A	1.02	±1.301		A	1.02	±1.301	
OHIP- 7	P	0.50	±0.816	0.314	P	0.50	±1.225	0.591	P	0.30	±1.063	0.572
	A	0.36	±0.875		A	0.36	±0.875		A	0.36	±0.875	

OHIP = Oral Health Impact Profile; TMD = temporomandibular disorder; P = presence of clinical temporomandibular disorder diagnosis (physical evaluation); A = absence of clinical temporomandibular disorder diagnosis (physical evaluation); M = OHIP-14 mean; SD = standard deviation; OHIP-1 = functional limitation; OHIP-2 = physical pain; OHIP-3 =psychological discomfort; OHIP-4 = physical incapacity; OHIP-5 = psychological incapacity; OHIP-6 = social incapacity; OHIP-7 disability.
* Statistically significant (p<0.05) (Kruskal-Wallis Test).

Confirming our study, other studies have also shown OHIP-14 scores markedly higher in TMD patients as compared to asymptomatic individuals, indicating further oral health-related QL impairment in the TMD group[6,8].

A health population base study in Germany has shown that TMD symptoms were associated to significant QL decrease, being that this has been higher for females as compared to males[17].

The need for treatment, according to the DMF index, reflects more severe TMD. In our study, individuals needing treatment had statistically higher oral health-related QL impairment as compared to individuals not needing treatment. Our data have also shown a positive relationship between TMD severity and further impact on QL. Individuals with severe TMD have as primary complaint the presence of pain, which plays a relevant role on psychosocial behavior and QL.

Other studies have also shown a positive relationship between OHIP-14 scores and TMD severity[6,10]. Confirming present results, a systematic literature review has shown that pain is one of the most relevant TMD symptoms and negatively affects oral health-related QL[15]. In this sense, orofacial pain has a substantial adverse impact on functional, physical and psychosocial wellbeing [18].

With regard to clinical signs, our study has observed that individuals with some clinical TMD sign had higher oral health-related QL impairment as compared to those with no TMD signs. Clinical muscle TMD signs represented a slightly higher impairment as compared to joint signs, however without statistically significant difference. The group of individuals with joint and muscle signs had statistically higher QL impairment as compared to the group with no clinical TMD signs.

The highest impact observed in individuals with muscle TMD signs may be supported by the clinical observation that patients with muscle disorders usually have more painful symptoms[6,7]. As a consequence, such symptoms may cause further limitations as compared to patients with joint signs, which very often may be asymptomatic, especially in cases of disc displacement with reduction[9].

These results are in line with other studies where it has been observed that TMD psychosocial impact is related to specific signs and symptoms, being that TMD diagnoses associated to pain, such as myofascial pain and arthralgia, have a higher impact on QL[6,7,9,15].

In this sense, individuals with myogenic disorders had oral health-related QL further impaired as compared to individuals with TMJ pain disorders and both myofascial and joint pain have higher impact as compared to disc displacement with reduction[9].

However, our study has observed that the presence of clinical joint TMD signs, including joint noises and mouth opening deviations, had a negative influence on perceived health.

Confirming our results, a different study has also shown a negative impact of joint disorders on QL[9]. Although many of such disorders are not associated to pain, symptoms such as clicking, crackle and jaw deviations influence the behavior of affected individuals and may be perceived by OHIP-14, thus they cannot be neglected by the clinician.

The higher QL impairment in the group with both muscle and joint signs may be explained by the fact that this group had more severe TMD when presenting with muscle and joint symptoms[10,15]. In this sense, a different study has also shown that patients with diagnosis of simultaneous muscle and joint pain had significant higher OHIP scores[9].

With regard to the seven OHIP-14 domains, groups with some clinical TMD sign had higher scores in all evaluated domains, except for disability in the group with muscle TMD signs. Functional limitation (p=0.045), physical pain (p=0.007) and psychological discomfort (p=0.045) were the most affected domains.

Several studies have also shown that physical pain is the most affected domain in TMD patients, and disability the least affected domain[6,8,10,13,15,19]. However, differently from these results, a study has shown that functional limitation was not statistically associated to the presence of TMD[8].

It is important to stress that differences found between our study and other studies may be explained by methodological differences. In our study, although using a clinical evaluation protocol, this had no specificity to diagnose the specific TMD type presented by patients. In contrast, studies using RDC/TMD evaluation protocol have the advantage of accurately stating the type of presented TMD.

CONCLUSION

Presence and severity of TMD impair oral health-related QL. OHIP-14 is a fast and versatile tool, able to estimate the impact of TMD signs and symptoms on QL and may also be used to monitor the impact of different types of TMD treatments allowing for better clinical results.

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