

# General Health Quality of Life in Patients with Temporomandibular Disorders in a Population-Based Cross-Sectional Study in Southern Brazil

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**Purpose:** To assess the impact of temporomandibular disorders (TMD) on general health quality of life in a Brazilian population-based cross-sectional survey. **Materials and Methods:** A total of 1,643 patients were assessed using the World Health Organization Quality of Life Bref (WHOQOL-Bref) and the Research Diagnostic Criteria for Temporomandibular Disorders Axes I and II (RDC/TMD). Cross-tabulation of the data was carried out to compare TMD subjects to controls in all domains of the WHOQOL-Bref and the RDC/TMD. **Results:** TMD subjects had significantly worse quality of life than controls in Axes I and II of the RDC/TMD and in all WHOQOL-Bref domains except for disc displacement. Osteoarthritis was significantly different only in the WHOQOL-Bref physical domain. **Conclusion:** TMD subjects had worse general health quality of life, particularly in Axis I groups with higher pain/disability levels (muscle disorders/arthritis). *Int J Prosthodont* 2019;32:237–240. doi: 10.11607/ijp.6072

Evaluations of quality of life (QoL) in individuals with temporomandibular disorders (TMD) have been restricted to questionnaires assessing oral health-related QoL. Population studies on the impact of TMD on QoL, especially general health-related QoL, using valid methodologies are still missing.<sup>1</sup> Therefore, this population-based cross-sectional study sought to evaluate the impact of TMD on general QoL in a Southern Brazilian population by comparing QoL domains in a nonclinical TMD population to controls without TMD.<sup>2</sup>

## MATERIALS AND METHODS

### Population and Research Design

Individuals (male and female) from 18 to 65 years of age who were registered in the Brazilian Government Ministry of Health Public Health System (SUS) in the city of Maringá (357,077 inhabitants) were the target population. Extraoral and intraoral clinical examinations were performed by a single trained clinical examiner following the guidelines of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) Axis I after assessment of clinical history using the RDC/TMD Axis II and SUS medical records.

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Submitted July 30, 2018;  
accepted September 16, 2018.

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**Table 1** Categorical Data Analyses of Temporomandibular Disorders (TMD) Subjects vs Controls Based on Axes I and II of the Research Diagnostic Criteria for TMD: Cross-Tabulation with the World Health Organization Quality of Life Bref (WHOQOL-Bref) Domains and Subdomains

WHOQOL-Bref Domains	TMD, Axis II (n = 584), n	Control, Axis II (n = 1,048), n	TMD Axis I, Group I (n = 484), n	Control, Group I (n = 1,159), n	TMD Axis I, Group II (n = 36), n	Control, Group II (n = 1,607), n	TMD Axis I, Group IIIa (n = 356), n	Control, Group IIIa (n = 1,287), n
<b>Physical</b>								
Needs improvement	89	41	79	53	1	131	56	76
Regular	275	344	221	403	18	606	171	453
Good	209	635	180	668	16	832	127	721
Very good	11	28	4	35	1	38	2	37
<i>P</i>	.000*		.000*		.920		.000*	
<b>Psychologic</b>								
Needs improvement	96	91	83	106	4	185	58	131
Regular	203	244	169	282	10	441	122	329
Good	235	597	190	647	18	819	146	691
Very good	50	116	42	124	4	162	30	136
<i>P</i>	.000*		.000*		.910		.000*	
<b>Social relations</b>								
Needs improvement	96	91	83	106	4	185	58	131
Regular	203	244	169	282	10	441	122	329
Good	235	597	190	647	18	819	146	691
Very good	50	116	42	124	4	162	30	136
<i>P</i>	.000*		.000*		.910		.000*	
<b>Environmental</b>								
Needs improvement	182	178	173	190	7	356	112	251
Regular	314	572	232	660	20	872	187	705
Good	85	293	76	304	7	373	54	326
Very good	3	5	3	5	2	6	3	5
<i>P</i>	.000*		.000*		.920		.000*	

The total number of patients was 1,643. For RDC/TMD Axis I, Group I = muscle pain; Group II = disc displacement; Group III = arthralgia/osteoarthritis/osteoarthritis. For RDC/TMD Axis II, subjects with a Graded Chronic Pain Scale score of 0 were considered controls, and those with scores of I, II, III, and IV were considered TMD subjects.  
 \*Significant (linear-by-linear association, *P* < .05).

**Table 2** Continuous Data Analyses of Temporomandibular Disorders (TMD) Subjects vs Controls Based on Axes I and II of the Research Diagnostic Criteria for TMD (RDC/TMD): Cross-Tabulation with the World Health Organization Quality of Life-Bref (WHOQOL-Bref) Domains

WHOQOL-Bref Domains	RDC/TMD Axis II			RDC/TMD Axis I, Group I			RDC/TMD Axis I, Group II			RDC/TMD Axis I, Group IIIa		
	No.	Mean (SD) score	<i>P</i>	No.	Mean (SD) score	<i>P</i>	No.	Mean (SD) score	<i>P</i>	No.	Mean (SD) score	<i>P</i>
<b>Physical</b>												
TMD	584	3.36 (0.67)	.000*	484	3.60 (0.65)	.000*	36	3.82 (0.59)	.625	356	3.59 (0.66)	.000*
Control	1,048	4.00 (0.54)		1,159	3.98 (0.56)		1,607	3.87 (0.61)		1,287	3.94 (0.58)	
<b>Psychologic</b>												
TMD	584	3.53 (0.63)	.000*	484	3.50 (0.63)	.000*	36	3.68 (0.62)	.633	356	3.51 (0.65)	.000*
Control	1,048	3.84 (0.58)		1,159	3.82 (0.59)		1,607	3.73 (0.62)		1,287	3.78 (0.59)	
<b>Social relations</b>												
TMD	584	3.56 (0.86)	.000*	484	3.55 (0.84)	.000*	36	3.76 (0.89)	.812	356	3.57 (0.86)	.000*
Control	1,048	3.83 (0.77)		1,159	3.81 (0.79)		1,607	3.73 (0.81)		1,287	3.78 (0.80)	
<b>Environmental</b>												
TMD	584	2.26 (0.66)	.000*	484	3.22 (0.70)	.000*	36	3.50 (0.62)	.523	356	3.28 (0.67)	.000*
Control	1,048	3.53 (0.61)		1,159	3.50 (0.59)		1,607	3.43 (0.64)		1,287	3.48 (0.62)	

The total number of subjects was 1,643. SD = standard deviation. For RDC/TMD Axis I, Group I = muscle pain; Group II = disc displacement; Group III = arthralgia/osteoarthritis/osteoarthritis. For RDC/TMD Axis II, subjects with a Graded Chronic Pain Scale score of 0 were considered controls, and those with scores of I, II, III, and IV were considered TMD subjects.  
 \*Significant (Student *t* test, *P* < .01).

	TMD Axis I, Group IIIb (n = 85), n	Control, Group IIIb (n = 1,558), n	TMD Axis I, Group IIIc (n = 201), n	Control, Group IIIc (n = 1,442), n
	17	115	25	107
	42	582	83	541
	26	822	89	759
	0	39	4	35
	.000*		.000*	
	12	177	19	170
	33	418	64	387
	35	802	103	734
	5	161	15	151
	.010*		.580	
	12	177	19	170
	33	418	64	387
	35	802	103	734
	5	161	15	151
	.010*		.580	
	34	329	52	311
	39	853	110	782
	12	368	39	341
	0	8	0	8
	.000*		.060	

Eligible subjects were excluded from the sample based on the following criteria: if they were diagnosed with caries or periapical or periodontal pathologies; if they had been using nonsteroidal anti-inflammatory drugs (NSAIDs) for more than 2 weeks (excluding paracetamol) due to possible gastrointestinal side effects; and/or if they had been using anxiolytics, anticonvulsants, and/or opioids, which affect the central nervous system (CNS). In addition, subjects with systemic and/or psychologic diseases/disorders that might have influenced the clinical examination or the diagnosis of TMD were also excluded. Other chronic diseases and pain conditions in the body (eg, previous medical/dental consultations and surgeries; hypertension; diabetes; osteoporosis; cholesterol; liver diseases; heart and lung diseases; fatigue; depression; sleep problems; headaches; back/neck pain; migraine; fibromyalgia; nausea; gastric alterations; numbness; and/or prior trauma to the face) were also verified. A brief clinical examination was then performed prior to examination with the RDC/TMD Axis I to check for any visible alterations in the oral mucosa and teeth (eg, ulcerations, oral lesions, caries, and/or periodontal disease), and these conditions were recorded as present or absent. In cases where oral diseases were reported and/or clinically suspected, patients were excluded from the study and then referred to the appropriate treatment facility in the Ingá Faculty of Dentistry.<sup>2</sup>

A total sample of 1,643 individuals was obtained (65.9% women; mean age 32.70 ± 10.26 years; 70.1% Caucasian; 75.1% with Brazilian medium income; and 79.9% with high school education or higher).

### Questionnaires

The RDC/TMD Axes I and II were used to assess clinical diagnoses (Axis I) and pain impact and socioeconomic, demographic, behavioral, and psychologic conditions (Axis II). Subjects with TMD in Axis I were classified as: Group I = muscle pain; Group II = disc displacement; Group IIIa = arthralgia; Group IIIb = osteoarthritis; and Group IIIc = osteoarthrosis. Those with no signs or symptoms of TMD were classified as controls. In addition, subjects completed a self-report questionnaire in Axis II (Graded Chronic Pain Severity [GCPS]) for the classification of pain intensity and disability. The GCPS divides TMD into 4 levels of pain and disability: Grade 0 = absence of pain in the last 6 months; Grade I = low-intensity pain; Grade II = high-intensity pain; Grade III = moderate functional limitation; and Grade IV = severe functional limitation.<sup>3</sup> Subjects with a grade of I to IV were considered TMD patients, while those with a grade of 0 were considered controls.<sup>2</sup>

The World Health Organization Quality of Life-Bref (WHOQOL-Bref) questionnaire was used for general QoL assessment. The WHOQOL-Bref is composed of 26 questions, with 2 questions related to general QoL and the others subdivided into 4 domains: physical,

RDC/TMD Axis I, Group IIIb			RDC/TMD Axis I, Group IIIc		
No.	Mean (SD) score	P	No.	Mean (SD) score	P
85	3.47 (0.64)	.000*	201	3.73 (0.66)	.000*
1,558	3.89 (0.61)		1,442	3.89 (0.61)	
85	3.39 (0.66)	.000*	201	3.63 (0.65)	.021*
1,558	3.74 (0.61)		1,442	3.63 (0.65)	
85	3.52 (0.71)	.000*	201	3.71 (0.71)	.644
1,558	3.74 (0.82)		1,442	3.73 (0.83)	
85	3.14 (0.67)	.000*	201	3.35 (0.63)	.054
1,558	3.45 (0.63)		1,442	3.45 (0.64)	

psychologic, social, and environmental. Each domain was further divided into 4 subdomains: needs to improve, regular, good, and very good. The lower the overall score, the worse the general health QoL.<sup>4</sup>

## RESULTS

Table 1 shows a cross-tabulation between the different WHOQOL-Bref domains and their subdomains against the RDC/TMD Axes I and II classifications. From the data, it is possible to observe that there was a very high statistical difference ( $P < .001$ ) in all WHOQOL-Bref domains between the RDC/TMD Axis II classification vs controls, showing that TMD significantly impacts the patient's general QoL and interferes not only in their physical and psychologic conditions, but also in their social relations and environment. Similarly, in the RDC/TMD Axis I analysis, it can be observed that muscle pain, arthralgia, and osteoarthritis (ie, Groups I, IIIa, and IIIb, respectively) had significantly ( $P < .001$ ) worse scores in all WHOQOL-Bref domains compared to controls. On the other hand, disc displacement (Group II) subjects were no different than controls in all domains, and osteoarthritis (Group IIIc) was significantly different ( $P < .001$ ) from controls only in the physical domain. In Table 2, a continuous variable analysis of the different domains of the WHOQOL-Bref was performed without the subdomains. The results were identical to Table 1 and are not discussed.

## DISCUSSION

One of the limitations of the present study is the fact that the results came from a population-based, cross-sectional, single-time assessment, which might either increase or decrease the effect of TMD pain on general QoL due to the fluctuation of signs and symptoms of TMD pain over time.<sup>3</sup> Therefore, longitudinal studies assessing the changes in QoL as a result of TMD pain using the RDC/TMD Axes I and II and general health measures of QoL are still needed.<sup>1</sup>

In addition, this study has controlled for most systemic diseases, sleep disorders, common chronic pain disorders, and the use of medication/drugs affecting the CNS, which might have altered pain perception and consequently the general health QoL. However, other general health conditions associated with TMD incidence that might have been overlooked and might have played a role in overstating these results, such as genital pain symptoms and cigarette smoking, must also be evaluated in future investigations.<sup>5</sup>

Finally, this study included the WHOQOL-Bref for general health QoL assessment in TMD patients. Other studies have used predominantly oral health-related

quality of life instruments, but TMD affects the individual systemically, not just orally.<sup>1</sup> Therefore, it is difficult to compare these results to other studies, especially considering that this investigation was also the only one to assess general health QoL in both RDC/TMD Axes I and II in the whole sample (ie, TMD subjects and controls); however, all studies in the literature have revealed a positive association between TMD pain and QoL.<sup>1,5</sup> In addition, most studies had small to medium clinical TMD patient samples and not a large population-based sample like in the present study. These considerations grant this study a high internal validity.<sup>1,5</sup> In addition, these Brazilian sociodemographic results are comparable to literature published in the Western hemisphere in which middle-class Caucasian women with postsecondary education at a child-bearing age are the predominant group, which demonstrates that this study also has good external validity.<sup>1</sup> However, more similar studies from other non-Western populations must also be performed.

## CONCLUSIONS

It can be concluded that the pain intensity and dysfunction caused by TMD presented a negative impact on the population's general health QoL in the physical, psychologic, social, and environmental domains. This impact was directly related to the higher pain intensity found in muscle pain, arthralgia, and osteoarthritis, as compared to those with lower pain intensity (ie, disc displacement and osteoarthritis).

## ACKNOWLEDGMENTS

The authors report no conflicts of interest. We would like to thank the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) for providing institutional scholarships (Code 01) for the students involved in this study.

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