



Oral health—related quality of life in women with temporomandibular joint disk anterior displacement before and after disk repositioning and anchoring surgery assessed with the Oral Health Impact Profile (OHIP-14)

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Objectives. The aim of this study was to assess and compare oral health—related quality of life (OHRQOL) in women with temporomandibular joint (TMJ) disk displacement without reduction, before disk repositioning and anchoring surgery, in short-term follow-up, in different age groups, and with use of the Oral Health Impact Profile (OHIP-14).

Study Design. Fifty women ages between 17 and 60 years were divided into 4 age groups: 17–27, 28–38, 39–49, and 50–60 years. All the patients were asked to answer the OHIP-14 form before surgery and during their short-term follow-up. Seven domains of OHRQOL were rated on a 5-point Likert scale from 0 (never) to 4 (very often). Domains' scores and total OHIP-14 were compared between times by using Student's *t* test in the whole sample and in the 4 age groups.

Results. Both the whole sample and the age groups (17–27, 28–38, 39–49 years) showed a statistically significant decrease in all scores ($P < .01$). The age group 50–60 years showed a decrease in scores significant only in functional limitation ($P = .05$)

Conclusions. TMJ disk anterior displacement had a negative impact on women's OHRQOL because of physical pain, physical disability, and psychological discomfort. TMJ disk repositioning and anchoring surgery improved overall OHRQOL in patients between 17 and 49 years of age; however, in patients between 50 and 60 years of age, there was improvement only in physical pain. (Oral Surg Oral Med Oral Pathol Oral Radiol 2019;128:112–116)

Anterior disk displacement is one of the most common temporomandibular disorders (TMDs), and women between 20 and 40 years of age are the demographic group with the highest incidence.¹ Displacement of the temporomandibular joint (TMJ) disk can cause clicking, articular pain, limited mouth opening, and functional limitations in chewing, swallowing, and speaking. If the TMD is left untreated, the articular disks tend to progressively move forward and degenerate, and this can later cause bone remodeling and decrease in condylar height.^{2,3} The prevalence of TMJ disk displacement in women does not have a definite cause. One possible explanation is that the presence of estrogen receptors in the TMJ triggers an increase in sensitivity to pain stimuli.

Surgery of the TMJ is a treatment alternative for patients with TMDs when there is no response to nonsteroidal antiinflammatory drugs (NSAIDs) or physical therapy. Surgery to reposition the TMJ disk was first described in the 19th century but became a recognized technique only in 1979.⁴ In the current surgical approach, the TMJ capsule is exposed, and the insertion of the lateral ligament is relieved to enable passive repositioning of the disk. Then, the disk is anchored with a miniscrew placed in the posterior condyle region.⁵

Because of chronic pain and reduced function, patients with TMDs may experience psychological problems and social changes, resulting in a negative impact on their quality of life.⁶ The impact of oral conditions in patients' daily lives can be assessed by using questionnaires, such as the Oral Health Impact Profile (OHIP-14).⁷ The OHIP-14 form is widely used in dentistry because it provides subjective assessments across 7 domains of oral health—related quality of life (OHRQOL), with adjustments made according to demographic features.^{8–12} The OHRQOL questionnaire is an important diagnostic tool but is seldom used in women with TMDs.¹³

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Statement of Clinical Relevance

Anterior disc displacement is a common temporomandibular disorder, with a higher incidence in women. Surgery of the temporomandibular joint can improve quality of life in patients who do not react to nonsteroidal anti-inflammatory drugs or physical therapy.

The objectives of the present study were to assess and compare OHRQOL in (1) women with TMJ disk displacement without reduction, (2) before disk repositioning and anchoring surgery, (3) in short-term follow-up, (4) in different age groups, and (5) with use of the OHIP-14 form. The null hypothesis was that there are no differences in OHIP-14 scores between the evaluation times in any of the age groups.

MATERIALS AND METHODS

The Research and Ethics Committee of the Institution approved the study (CAAE 56557016 1 0000 5336). Eligible participants were women with TMDs with TMJ disk anterior displacement without reduction, treated with disk repositioning and anchoring surgery between January 2015 and October 2016. The study inclusion criteria were good health, age greater than 15 years, presence of anterior articular disk displacement without reduction, a history of failed NSAID treatment or physical therapy, and having answered the OHIP-14 form before and after surgery. We excluded patients with condylar ankylosis, systemic diseases, or previous TMJ surgery. All the participants read and signed an informed consent form before enrollment in the study.

In total, 50 female patients ages between 17 and 60 years (mean age 34.8 ± 9.9 years) met the study inclusion criteria. These patients were divided into 4 age groups: 17–27 years, 28–38 years, 39–49 years, and 50–60 years (Table I). All the patients were asked to answer the OHIP-14 form in the Portuguese language before surgery (T0) and during their postoperative 3- to 6-month follow-up (T1).^{14,15} Fourteen items were rated on a 5-point Likert scale: 0 = never; 1 = nearly never; 2 = occasionally; 3 = fairly often; and 4 = very often. Domains' scores were calculated with weighed arithmetic means in functional limitation (item 1 = 0.51; 2 = 0.49), physical pain (3 = 0.34; 4 = 0.66), psychological discomfort (5 = 0.45; 6 = 0.55), physical disability (7 = 0.53; 8 = 0.47), psychological disability (9 = 0.6; 10 = 0.4), social disability (11 = 0.38; 12 = 0.62); and handicap (13 = 0.41; 14 = 0.59). The OHIP-14 total score gave the sum of domains' scores, ranging between 0 and 28, where 0 means no impact in OHRQL, and higher scores mean increasing negative impact in OHRQL.

The decision to perform TMJ disk repositioning and anchoring surgery was based on the Research Diagnostic Criteria for TMD (RDC/TMD), a self-reported tool to

Table I. Sample characteristics

	Total	Age (years)			
		17–27	28–38	39–49	50–60
N	50	10	26	9	5
%	100	20	52	18	10

Table II. Score distribution by OHIP-14 item ($N = 50$)

Domain	Item	Statement	OHIP-14					Before treatment (T0)					Follow-up (T1)				
			Score (%)					Score (%)					Score (%)				
			0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Functional limitation	1	Have you had trouble pronouncing any words because of problems with your mouth or joint?	40	26	22	8	4	40	26	22	8	4	76	22	2	0	0
	2	Have you felt that your sense of taste has worsened because of problems with your mouth or joint?	64	24	10	2	0	64	24	10	2	0	84	14	0	2	0
Physical pain	3	Have you had painful aching in your mouth or joint?	6	40	34	20	0	6	40	34	20	0	32	62	6	0	0
	4	Have you found it uncomfortable to eat any foods because of problems with your mouth or joint?	0	2	34	42	22	0	2	34	42	22	40	46	12	0	2
Psychological discomfort	5	Have you been self-conscious because of problems with your mouth or joint?	2	8	42	26	22	2	8	42	26	22	36	44	20	0	0
	6	Have you felt tense because of problems with your mouth or joint?	8	28	30	18	16	8	28	30	18	16	40	42	18	0	0
Physical disability	7	Has your diet been unsatisfactory because of problems with your mouth or joint?	0	4	36	34	26	0	4	36	34	26	34	44	20	0	2
	8	Have you had to interrupt meals because of problems with your mouth or joint?	2	16	36	26	20	2	16	36	26	20	36	48	14	2	0
Psychological disability	9	Have you found it difficult to relax because of problems with your mouth or joint?	4	28	32	20	16	4	28	32	20	16	44	36	18	2	8
	10	Have you been a bit embarrassed because of problems with your mouth or joint?	30	36	16	6	12	30	36	16	6	12	70	28	2	0	0
Social disability	11	Have you been a bit irritable with other people because of problems with your mouth or joint?	36	34	16	8	6	36	34	16	8	6	84	16	0	0	0
	12	Have you had difficulty doing your usual jobs because of problems with your mouth or joint?	34	30	22	8	6	34	30	22	8	6	72	22	4	0	2
Handicap	13	Have you felt that life in general was less satisfying because of problems with your mouth or joint?	44	24	20	4	8	44	24	20	4	8	74	18	8	0	0
	14	Have you been totally unable to function because of problems with your mouth or joint?	58	22	14	4	2	58	22	14	4	2	82	18	0	0	0

0 = never/do not know; 1 = nearly never; 2 = occasionally; 3 = fair often; 4 = very often.
OHIP, Oral Health Impact Profile.

assess psychosocial factors related to chronic pain, and magnetic resonance imaging (MRI). Surgery on the TMJ began with a standard endaural incision with an anterior release. A flap in the zygomatic arch region elevated the skin, subcutaneous tissues, and superficial fascia temporalis, exposing the joint capsule. A saline–epinephrine solution was injected superiorly in the joint space to confirm capsule access, inducing forward mandibular movement. The articular capsule was dissected by using a #15 blade, and the articular disk was inspected. The attachments of the anterior, lateral, and medial ligaments were released, and the disk was passively repositioned over the condylar head. A self-drilling miniscrew (Ancortec; Engimplan, Rio Claro, SP, Brazil) was inserted posteriorly in the condyle, 8 to 10 mm below the condylar head, just lateral to the midsagittal plane. The TMJ disk was anchored in the miniscrew by using one horizontal mattress suture (double 2-0 nonresorbable polyester).

Statistical analysis

The Kolmogorov-Smirnov test indicated normal distribution of data. Descriptive statistics determined means, standard deviations, and mean differences. Domains' scores and the OHIP-14 total score were compared between evaluation times, in the whole sample and for each group, by using paired Student's *t* test. Data were analyzed in the R Core Team software version 3.3.1 (R Foundation Statistical Computing, Vienna, Austria). Significance level was set at 5%.

RESULTS

Sample size calculation determined that 50 patients were needed to detect 17% differences between OHIP-14 scores, and 5 patients to detect differences of 50%, with a power of 80% and 0.05 alpha value (18.5 ± 7.7)¹⁶ (Sample Size Calculator, ClinCalc, Arlington, IL).

All the participants completed 12 months of follow-up. Domains with a higher percentage of the scores 3 or 4 at baseline were physical pain (64%) and physical

disability (60%), followed by psychological discomfort (48%). Most patients assigned scores of 0 or 1 to a psychological disability (66%), a social disability (70%), a handicap (80%), and a functional limitation (88%). Therefore, TMJ disk anterior displacement was mainly a physical problem (Table II).

In the 3- to 6-month follow-up, 78% to 100% of the scores were 0 (never) or 1 (nearly never); whereas 0% to 8% of the scores were 3 (fair often) or 4 (very often) (see Table II).

The score decreased significantly between evaluation times in all of the domains, as well as in the total OHIP-14 ($P < .01$). The OHRQOL of the patients improved by 65% to 75% in the short term (Table III). The 17–27 years group, the 28–38 years group, and the 39–49 years group showed a decrease in scores that was statistically significant in all the domains ($P < .01$). The 50–60 years group showed a significant score decrease only in functional limitation ($P = .05$) (Table IV).

DISCUSSION

On the basis of the results, the null hypothesis was rejected because there were statistically significant differences in the OHIP-14 scores before surgery and 3–6-months follow-up, in the whole sample, and in all age groups.

The sample selection included only females who experienced anterior disk displacement without reduction to control confounding factors because TMD has a multifactorial etiology and anterior disk displacement has a higher incidence in women. Age distribution showed a 70% overlap in the second to fourth decades of life, the typical period of anterior disk displacement in women.¹ Patients had failed NSAID treatment or physical therapy and had persisting TMJ internal derangement.¹⁷ The TMD diagnosis was based on the Brazilian version of the RDC/TMD, which is considered a reliable tool when combined with MRI.

Table III. Descriptive statistics of OHIP-14 scores in the whole sample

Domain	Whole sample (N = 50)				
	Before surgery T0	Follow-up T1	Mean diff. T1 – T0	Mean diff. T1 – T0	P
	Score Mean (SD)	Score Mean (SD)	Score	%	
Functional limitation	0.8 (0.8)	0.2 (0.4)	–0.6	75	<.01*
Physical pain	2.8 (0.8)	0.8 (0.6)	–2	71	<.01*
Psychological discomfort	2.3 (1)	0.8 (0.7)	–1.5	65	<.01*
Physical disability	2.6 (0.9)	0.9 (0.7)	–1.7	65	<.01*
Psychological disability	1.8 (1.1)	0.6 (0.6)	–1.2	67	<.01*
Social disability	1.2 (1.1)	0.3 (0.5)	–0.9	75	<.01*
Handicap	0.9 (0.2)	0.3 (0.5)	–0.6	67	<.01*
Total OHIP-14	12.5 (5.8)	3.8 (3)	–8.7	70	<.01*

*Statistical significance. Student's *t* test ($P < .05$).

SD, standard deviation.

Table IV. Descriptive statistics of OHIP-14 scores in each age group

Domain	Group I 17–27 years (N = 10)			Group II 28–38 years (N = 26)			Group III 39–49 years (N = 9)			Group IV 50–60 years (N = 5)		
	T0 Mean (SD)	T1 Mean (SD)	P	T0 Mean (SD)	T1 Mean (SD)	P	T0 Mean (SD)	T1 Mean (SD)	P	T0 Mean (SD)	T1 Mean (SD)	P
Functional limitation	0.7 (0.8)	0.1 (0.3)	<.01*	1.1 (0.9)	0.3 (0.5)	<.01*	0.5 (0.5)	0.1 (0.2)	.02*	0 (0)	0.3 (0.7)	.81 ^{NS}
Physical pain	2.7 (0.4)	0.8 (0.5)	<.01*	2.8 (0.8)	0.7 (0.5)	<.01*	2.9 (0.8)	0.9 (0.8)	<.01*	2.5 (1.1)	1.1 (1.2)	.05*
Psychological discomfort	2.7 (0.4)	1.1 (0.7)	<.01*	2.4 (1.1)	0.7 (0.7)	<.01*	2.1 (1.1)	0.7 (0.4)	<.01*	2.1 (1.1)	0.8 (0.8)	.07 ^{NS}
Physical disability	2.6 (0.6)	0.9 (0.7)	<.01*	2.8 (1)	0.9 (0.7)	<.01*	2.7 (0.9)	0.6 (0.7)	<.01*	2 (0.9)	1.3 (1.2)	.23 ^{NS}
Psychological disability	2 (0.7)	0.9 (0.6)	<.01*	2 (1.2)	0.6 (0.7)	<.01*	1.4 (1.2)	0.4 (0.6)	.02*	1.7 (1.3)	0.4 (0.5)	.07 ^{NS}
Social disability	1.1 (0.7)	0.2 (0.5)	<.01*	1.2 (1.1)	0.2 (0.4)	<.01*	1.3 (1.6)	0.3 (0.5)	.02*	1 (1.2)	0.6 (1.1)	.26 ^{NS}
Handicap	0.9 (0.7)	0.3 (0.5)	.03*	0.9 (1)	0.2 (0.4)	<.01*	1.2 (1.6)	0.2 (0.5)	.04*	0.8 (1.4)	0.3 (0.7)	.27 ^{NS}
Total OHIP-14	12.4 (3)	4.4 (2.6)	<.01*	13.1 (2.8)	3.7 (2.8)	<.01*	12.1 (6.1)	3.2 (2.5)	<.01*	10.1 (6)	4.8 (4.4)	.13 ^{NS}

*Statistical significance, Student's *t* test ($P < .05$).

NS, no statistical significance; SD, standard deviation.

There is an increasing interest in patients' perceptions of the impact of TMD symptoms and TMJ treatment outcomes on OHRQOL.^{11,12,14–16} TMJ disk displacement can result from rupture, herniation, stretching, or degeneration of the holding ligaments. TMJ etiology includes trauma, parafunction, malocclusion, hormones, local or systemic diseases, and bacterial or viral infections.¹⁸ Surgeons' training and experience on TMD management may influence the decision to perform TMJ surgery and the choice of technique.¹⁹ ORHQOL assessment can determine the best individualized treatment approach for patients with TMD.⁹

Most patients reported discomfort in eating certain foods, unsatisfactory diet, and interruption of meals because of TMDs. These events raised concerns about TMDs in 82% to 98% of patients, who indicated an overall response as “occasionally,” “fair often,” or “very often” (see Table II).

Before surgery, higher mean scores in physical pain, physical disability, and psychological discomfort were in line with the findings of other studies that used the OHIP-14 form.^{10,16} Overall, all of the domain scores decreased significantly during short-term follow-up; however, mean differences were greater in domains with higher scores at baseline. Lower mean scores before surgery were observed in functional limitation, handicap, and social disability, indicating low impact on OHRQOL. Psychological discomfort, psychological disability, and social disability improved by 65% to 75% throughout the study, which is in line with the OHRQOL principles defined by the World Health Organization.²⁰ Once physiological conditions are reestablished, psychological health improves, as well as the capacity for social communication and social adjustment.

In the age group 50–60 years, only physical pain showed a statistically significant decrease in the scores between times. Also, before surgery, mean psychological discomfort was slightly higher than physical disability. These findings have a 2-fold explanation: (1) the presence of one outlier in a group of only 5 participants and (2) potential longer waiting time from the onset of TMD symptoms until TMJ surgery. One study reported that TMJ disk repositioning surgery has a 90% success rate in the first 4 years, decreasing to around 68% after that. Early TMD diagnosis and timing of articular disk repositioning surgery could prevent the progression of osteoarthritis and disk degeneration.²¹ The presence of osteoarthritis is more frequent and severe in older patients because of the long course of the disease. Besides, older patients present slower cartilage regeneration and slower drug absorption, making TMD symptoms more refractory to treatment.¹⁶

A limitation of the study was the short follow-up time. We wondered if a longer follow-up would decrease the sample size. The OHIP-14 form has proven to be a reliable and valid tool for obtaining patient self-report of

OHRQOL, based on patient's psychometric responses. However, the arrangement of responses may lead to subjective assessment; it is not possible to ascertain whether patients consider absolute numbers or mean frequency within a given period. Recall bias also needs to be taken into consideration because of the possible overestimation of benefits in the follow-up consultations.²² Studies based on oral health questionnaires provide relative, not absolute, measures; therefore, these studies only provide indications of patients' experiences and perceptions.²³ Nonetheless, the OHIP-14 form has been widely used in clinical trials and dental research because of the widespread acceptance of its English version and because there is no consensus on the definition of OHRQOL.

CONCLUSIONS

In this study, TMJ disk anterior displacement had a negative impact on women's OHRQOL because of physical pain, physical disability, and psychological discomfort. TMJ disk repositioning and anchoring surgery improved overall OHRQOL in patients between 17 and 49 years of age; however, in patients between 50 and 60 years of age, improvement was seen only in physical pain.

DISCLOSURE

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