



## ORIGINAL ARTICLE

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## Evaluation of quality of life in Chilean patients with orthognathic surgery. A cohort study.

**Abstract:** To compare the presurgical and immediate postsurgical quality of life in Chilean patients with orthognathic surgery. **Material and Methods:** Cohort study. The study included 30 patients (mean age 20.73, 53.33% male) who underwent orthognathic surgery primarily for severe skeletal abnormalities, (17 surgeries, 56.7%) and moderate skeletal abnormalities (12 surgeries, 40%), from three Chilean hospitals between February and June 2016. Patients were asked to answer the *World Health Organization quality of life Bref version* questionnaire (WHOQOL-BREF) validated in Spanish to measure quality of life (QoL) two weeks before and three months after the surgery. Scores for general QoL and for every domain of QoL were described. Variations in the scores of general QoL were analyzed according to sex and severity of orofacial malformation (mild, moderate or severe) (t-test  $p < 0.05$ ; STATA 10.0). **Results:** The average score for QoL according to the WHOQOL-BREF scale was  $76.43 \pm 13.83$  before surgery and  $90.5 \pm 7.18$  three months after surgery ( $p < 0.001$ ). Statistically significant differences according to sex and type of orofacial malformation were found ( $p < 0.01$ ). An increase in the score in all the domains of the WHOQOOL-BREF scale was observed. **Conclusion:** Orthognathic surgery significantly improved QoL scores in Chilean patients according to the WHOQOL-BREF scale.

**Keywords:** *Orthognathic Surgery, Quality of Life, Dentofacial Deformities, Chile.*

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## INTRODUCTION.

From 65% to 72.6% of Chilean children between 5 and 14 years of age suffer from some type of malocclusion.<sup>1</sup> In addition, the 96.2% of the population between 6 and 15 years old have malocclusions and of these, 44.6% require orthodontic treatment.<sup>2</sup> On the other hand, there are no data regarding the prevalence of skeletal anomalies with potential surgical treatment in the Chilean population. However, a study conducted in Mexico suggests a prevalence of 37.1% of

class II and 9.6% of class III.<sup>3</sup>

Patients with dentofacial abnormalities tend to develop emotional and social disorders given the importance of facial aesthetics for their self-confidence and acceptance in society.<sup>4,5</sup> This has led to an increase in the number of patients opting for orthodontic-surgical treatments to improve their dentofacial aesthetics and masticatory function. In some cases, patients seek psychosocial benefits, improvements in interpersonal relationships, and psychological

well-being.<sup>6</sup> The effect of orthognathic surgery on the quality of life (QoL) of these patients has been previously studied, showing a significant increase in QoL. This increase can be observed in aspects such as facial aesthetics, oral function and social interaction, the latter being the most relevant.<sup>4,7,8</sup> However, studies suggest that in some cases patients may overestimate postsurgical results. A new facial appearance could give patients unrealistic expectations regarding the goals of the treatment, such as success in professional or marital relationships.<sup>7</sup>

Evaluation of patients' QoL before and after orthognathic surgery can provide complementary data to the objective assessments of success provided by the health team.<sup>9,10</sup> Consequently, the *World Health Organization questionnaire* (WHOQOL-BREF), validated in Spanish, allows a quantification of QoL in three areas: physical, social and psychological. WHOQOL-BREF has been previously used in patients who have undergone orthognathic surgery.<sup>11</sup>

To date, there are no reports quantifying the effect of orthognathic surgery on the QoL of the Chilean population. The aim of this study is to compare the presurgical and the immediate postsurgical QoL in Chilean patients with dento-facial anomalies who underwent orthognathic surgery.

## MATERIALS AND METHODS.

### Study design

A cohort study was carried out in patients with orthognathic surgery in the cities of Santiago, Valdivia, and Temuco during the first half of 2016. Protocol and informed consent were approved by the Ethics and Research Committee of the Health Service of Valdivia (No. 374/2016).

### Participants

Thirty patients older than 17 years with congenital orofacial malformation and who agreed to voluntarily participate in the study were selected. Subjects with previous orthognathic surgery, orofacial malformation due to trauma, cancer or other malformation such as cleft lip and palate or associated syndrome were excluded from the study. The group of patients who underwent orthognathic surgery was selected for convenience. Sample size calculation considered

a 5-point increase in QoL, a 95% confidence level and a margin of error of 15%. A sample size of 30 subjects was estimated.

### Variables

The WHOQOL-BREF scale validated in Spanish was used to measure QoL.<sup>11</sup> This instrument comprises 4 domains (Physical Health, Psychological Health, Social Relationships and Environment) with a total of 26 items. Each one of the items has a five-point Likert scale; the scale ranges from 0 (worst QoL) to 100 points (best QoL). The confidence level measured with Cronbach's alpha index for each domain is: Physical health 0.80, Psychological health 0.78, Social relationships 0.75 and Environment 0.78.

Variables regarding sex, age, city (Valdivia, Temuco, Santiago) and severity of malformation were also registered ("mild" for mandibular or maxillary osteotomy, "moderate" for maxillomandibular osteotomy without genioplasty, and "severe" for maxillomandibular osteotomy with genioplasty).

### Data collection

Each selected patient answered the questionnaire administered by one researcher (G.L.) during the presurgical evaluation interview. Patients had 20 minutes to respond. The researcher was allowed to answer any doubts by providing verbal feedback without intervening in the choice of the alternatives given in the instrument.

Three months after the surgery, at the postsurgical checkup, one researcher (M.C.) applied the questionnaire in similar conditions.

Sociodemographic data, severity, and QoL values of each patient were entered into a Google Drive data sheet (Google INC. USA).

### Statistic analysis

Descriptive statistical analysis was performed, including frequency, mean and standard deviation for age, sex, city and severity of malformation. t-test was used to compare the level of presurgical and postsurgical QoL (general and by domains). In addition, presurgical and postsurgical QoL was compared according to sex and severity of malformation. A level of significance of  $p < 0.05$  was considered. Analyses were performed with STATA 10.0 (STATA Corp®, USA).

**Table 1.** WHOQOL-BREF. Comparison of QoL before and after orthognathic surgery according to domains.

	Before			After			p
	QoL	SD	CI(95%)	QoL	SD	CI (95%)	
Total	76.43	13.83	71.26 – 81.59	90.5	7.18	87.82 – 93.18	<0.0001
Physical Health	20.37	3.89	18.91 – 21.82	24.47	1.99	23.72 – 25.21	<0.0001
Psychological Health	18.87	3.89	17.41 – 20.32	23.33	1.71	22.69 – 23.97	<0.0001
Social Relationships	9.03	2.67	8.03 – 10.03	11.5	2.24	10.66 – 12.34	0.0003
Environment	29.17	5.17	26.23 – 30.09	31.2	3.63	29.84 – 32.56	0.01

QoL: Quality of Life; SD: Standard deviation; CI: Confidence Interval.

**Table 2.** QoL score in WHOQOL-BREF according to sex.

Sex	Before			After			p
	QoL	SD	CI (95%)	QoL	SD	CI (95%)	
Male	74.81	13.7	67.49 – 82.13	89.06	7.94	84.83 – 93.29	0.001
Female	78.29	14.2	70.08 – 86.49	92.14	6.07	88.64 – 95.65	0.002

QoL: Quality of life; SD: Standard deviation; CI: Confidence Interval.

**Table 3.** QoL score in WHOQOL-BREF according to severity of malformation.

Severity	Before			After			p
	QoL	SD	CI (95%)	QoL	SD	CI (95%)	
Moderate	73.42	14.92	63.94 – 82.9	88.42	7.88	83.41 – 93.42	0.005
Severe	79.35	12.91	72.72 – 85.99	92	6.72	88.55 – 95.45	0.001

QoL: Quality of life; SD: Standard deviation; CI: Confidence Interval.

## RESULTS.

Thirty patients participated in the study, 16 males (53.3%). No losses occurred during the course of the research. Mean age was  $20.73 \pm 2.53$  years, with a range of 17 to 26 years. Patients came from hospitals in Valdivia (17%), Temuco (23%) and Santiago (60%).

The most frequent surgery was bimaxilar osteotomy with mentoplasty in 17 cases (56.67%), followed by bimaxillary osteotomy in 12 cases (40%) and 1 case of unimaxillary osteotomy (3.33%).

The presurgical QoL score according to the WHOQOL-BREF scale was  $76.43 \pm 13.83$  and  $90.5 \pm 7.18$  three months

after the surgery ( $p < 0.0001$ ). Scores for each domain before and after surgery are shown in Table 1. Scores of presurgical and postsurgical QoL according to sex are shown in Table 2. QoL scores of patients with moderate and severe anomaly are summarized in Table 3. Only one patient with mild severity was registered and consequently excluded from this analysis.

## DISCUSSION.

The results of this study confirm an increase in the QoL of patients after orthognathic surgery. This agrees with other studies, which show an increase in QoL scores at 4 and 6 months after surgery.<sup>8,12,13</sup> Other authors report postsurgical

satisfaction scores of 77.9%, with postsurgical satisfaction results ranging from 8 to 10 points in the Visual Analogue Scale 12 months after the surgery.<sup>14</sup> One study in Germany reported a high patient satisfaction after orthognathic surgery, mainly in those patients with class III skeletal abnormalities.<sup>9</sup>

When comparing QoL to severity of malformation, lower QoL scores were observed in patients with moderate dentofacial abnormality when compared with severe. A similar study suggests that patients with mild orofacial malformation tend to have a lower QoL than patients with severe malformation, suggesting that the latter would have a better perception of postsurgical success.<sup>10</sup>

It was observed that QoL scores increased in men and women. Similar results are found in a study reporting that QoL increases in the same level in both sexes.<sup>10</sup> However, in another study researchers found that the postsurgical perception of QoL is lower in women than in men.<sup>15</sup>

An increase in QoL was observed in the individual scores in all the domains of the questionnaire. Comparing these results to other studies, it is concluded that orthognathic surgery can be associated with a significant improvement in the patient's QoL in the medium term, both psychologically and socially.<sup>16,17</sup> Another study suggests that improvements in social relationships and QoL should be considered as an independent success measure after this type of surgery.

A significant increase in the Social Relationships domain was observed, as reported in other studies conducted in Brazil and Saudi Arabia.<sup>10,18,19</sup> On the other hand, research conducted in India and Ireland suggests that there are only statistically significant differences in the Facial Esthetics domain and not in other aspects. This does not agree with the

results obtained in the Chilean population.<sup>4,20</sup>

Within the limitations of this study is the use of an instrument for measuring only general aspects of QoL. QoL is a broad construct whose aspects may not be directly related to orthognathic surgery.<sup>11</sup> In addition, sampling was for convenience, which may not reflect the QoL of Chilean patients who have undergone orthognathic surgery. On the other hand, patients could have overestimated postsurgical measurements to avoid affecting the final result of the surgery.

For future studies it is suggested the inclusion of psychosocial aspects that may allow a better evaluation of the success of the treatment and to study factors associated with negative outcomes of orthognathic surgery.

## CONCLUSION

Orthognathic surgery significantly improved QoL scores in Chilean patients according to the WHOQOL-BREF scale.

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## **Evaluación de la calidad de vida en chilenos sometidos a cirugía ortognática. Estudio de cohorte.**

**Resumen:** Comparar la calidad de vida pre y postquirúrgica inmediata en pacientes chilenos sometidos a cirugía ortognática. Materiales y método: Estudio de cohorte. Participaron 30 pacientes (edad promedio 20.73, 53.33% hombres) sometidos a cirugía ortognática, principalmente por

anomalía esquelética severa (17 cirugías, 56.7%) y moderada (12 cirugías, 40%) de tres hospitales chilenos entre los meses de febrero y junio del 2016. Cada paciente respondió el cuestionario autocumplido World Health Organization Quality of Life Bref version (WHOQOL-BREF) validado en español para el registro de la calidad de vida (CV) en cirugía ortognática, previo a la cirugía y luego de tres meses postoperatorio.

Se describieron los puntajes de CV general y por dominios, se analizaron los cambios en la CV general según sexo y severidad de la malformación orofacial (leve, moderada o severa) (t-test  $p < 0.05$ ; STATA 10.0). Resultados: El promedio del puntaje de CV fue  $76.43 \pm 13.83$  antes de cirugía y  $90.5 \pm 7.18$  después de tres meses de cirugía ( $p < 0.001$ ). Las diferencias fueron estadísticamente significativas según sexo y tipo de

malformación orofacial ( $p < 0.01$ ). Se observó un aumento de los valores en todos los dominios de la encuesta WHOQOL-BREF. Conclusión: La cirugía ortognática mejoró significativamente los puntajes de CV en pacientes chilenos según la escala WHOQOL-BREF.

**Palabras clave:** *Cirugía Ortognática, Calidad de Vida, Anomalía Dentofacial, Chile.*

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