

Research Article

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## Quality-of-Life Assessment in Orthognathic Surgery Patients: The Effect of Orthognathic Surgery on Aesthetic Perception, Psychosocial Well-being, and Oral Function

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### Abstract

**Purpose:** People with dentofacial deformities experience functional difficulties, aesthetic impairments, and psycho-social issues. The aim of our study was to evaluate the effect of orthognathic surgery on the quality of life (QoL) of patients.

**Material and Methods:** The subjects for this study were patients who underwent orthognathic surgery at King Abdulaziz University, Jeddah. A total of 29 participants responded to the QoL questionnaire. The questions were asked in both the pre-treatment phase and post-treatment phase. Each phase consisted of the following three main areas: facial aesthetics, psycho-social satisfaction, and oral function.

A scoring system “satisfaction score” was calculated by taking the average measure and converting it to a 100-point scale, where 0 is extremely dissatisfied and 100 is extremely satisfied. A paired Student’s t-test was used to compare the satisfaction score mean measures at two time points (pre-treatment and post-treatment). Statistical significance was set at a p-value < 0.05.

**Results:** There was a statistically significant improvement in the satisfaction score of facial aesthetics between the pre-treatment and post-treatment periods in both males and females (p < 0.003 and p < 0.001, respectively). There was no improvement in the psycho-social satisfaction score in the post-treatment period in males (p < 0.343). However, a statistically significant improvement was found in females (p < 0.016) regarding psycho-social satisfaction. The oral function satisfaction score improved in both females and males (p < 0.042 and p < 0.001, respectively).

**Conclusion** Orthognathic surgery can have a positive effect on the QoL of the patient. A thorough discussion with the patient should occur in the pre-treatment phase to determine the patient’s motive and expectations.

**Keywords:** Orthognathic Surgery, Orthodontic Treatment, Dentofacial Deformity, Quality Of Life, Smile Perception

### Introduction

The World Health Organization (WHO) defines Quality of Life (QoL) as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (1). The assessment of QoL has been proven to be valid in evaluating the quality and effectiveness of various available treatment approaches (2, 3). Patients with dentofacial deformities have had

an apparent distortion in maxillomandibular relationships and QoL (4).

Orthognathic surgery, which involves combined orthodontic and surgical treatment, is the optimum solution for patients with severe dentofacial deformities. The aim of this treatment is not only to improve the aesthetic appearance of a patient but also to aid in proper orthodontic therapy to reach an end result with good and

stable occlusion (5). Many studies evaluating the QoL of a patient who underwent correction of dentofacial deformities exist in the literature (5, 6). These studies evaluated and assessed the psychosocial impact of orthognathic surgery (7), positive life changes (8), and other oral functions (7).

The aim of our study was to evaluate the effect of orthognathic surgery on the QoL of patients by assessing the following three components: aesthetic outcome, psycho-social well-being of the subject, and oral function (speech and mastication) in the pre-treatment and post-treatment periods.

## Materials and Methods

### Subjects and Questionnaire:

This study was approved by the Research Ethics Committee of the Faculty of Dentistry (REC-FD), at King AbdulAziz University, Jeddah, Saudi Arabia.

The subjects for this study were patients who underwent orthognathic surgery at King Abdulaziz University, Jeddah, between 2004 and 2014. The inclusion criteria were all subjects 18 years old and above who had a skeletal malocclusion treated with orthodontics followed by a bi-maxillary orthognathic surgery procedure, with or without a genioplasty. Exclusion criteria included: those who underwent a single jaw surgery and patients with a malocclusion associated with any congenital deformity, such as clefts or craniofacial syndromes.

A total of 29 participants (12 males and 17 females) fulfilled the criteria and agreed to participate in the completion of a questionnaire developed by the authors. To complete the questionnaire, phone interviews were performed by one of the authors. Participation was voluntary, and the participants were assured confidentiality of their responses. The study subjects answered the questions at two time-points: before orthodontic treatment (pre-treatment phase) and after at least one year of completion of orthognathic surgery and post-surgical orthodontics (post-treatment phase).

The authors prepared the questionnaire by taking reference from the Oral Health Impact Profile-14 (OHIP-14) questionnaire. It consisted of questions divided into two sections, pre-treatment and post-treatment (more than 1 year). For each item, the participant was asked to choose an answer from the following scale: not at all, little, moderately, and extremely.

The questions in the pre-treatment and post-treatment time points addressed three main areas as follows:

- Facial aesthetics: Satisfaction with facial appearance and smile.
- Psycho-social impact: The effect of the dentofacial deformity on the patient's social life and career.
- Oral function: Problems in mastication and speech.

The participants were also asked at the post-treatment phase if they would recommend this treatment to others.

### Statistical Analysis

A reliability analysis, Cronbach's Alpha, was used to test the internal consistency of the responses of the samples in each domain. A scoring system "satisfaction score" was devised by

taking the average measure and converting it to a 100-point scale, where 0 is extremely dissatisfied and 100 is extremely satisfied. A paired Student's t-test was used to compare the satisfaction score mean measures at two time points (pre-treatment and post-treatment). Statistical significance was set at a p-value < 0.05. All statistical analyses were carried out using SPSS, version 22 (IBM, Chicago, IL, USA).

## Results

A total of 29 participants (12 males [41.4%] and 17 females [58.6%]) were included in the study. The mean age was 28.14 years with a range of 18–46 years.

### Facial Aesthetics

In this study, 41% of the respondents were dissatisfied about their pre-treatment facial appearance, and 62.1 % were dissatisfied about their pre-treatment smile (Figure 1). In the post-treatment period, the percentage of those dissatisfied with their facial appearance dropped to 6.9 %. Moreover, 44.8% of the respondents were moderately satisfied with their smile, and 51.7% were extremely satisfied, with only 3.4 % completely dissatisfied with their smile (Figure 2).

The mean satisfaction score for both males and females for pre-treatment facial aesthetics was  $28.16 \pm 29.2$ . There was a statistically significant improvement in the satisfaction of facial aesthetics in the post-treatment period, with a mean score of  $(81.03 \pm 23)$  ( $p < 0.001$ ). Both males and females showed this significant improvement ( $p < 0.003$  and  $p < 0.001$ , respectively) (Table 1).

### Psychological and Social

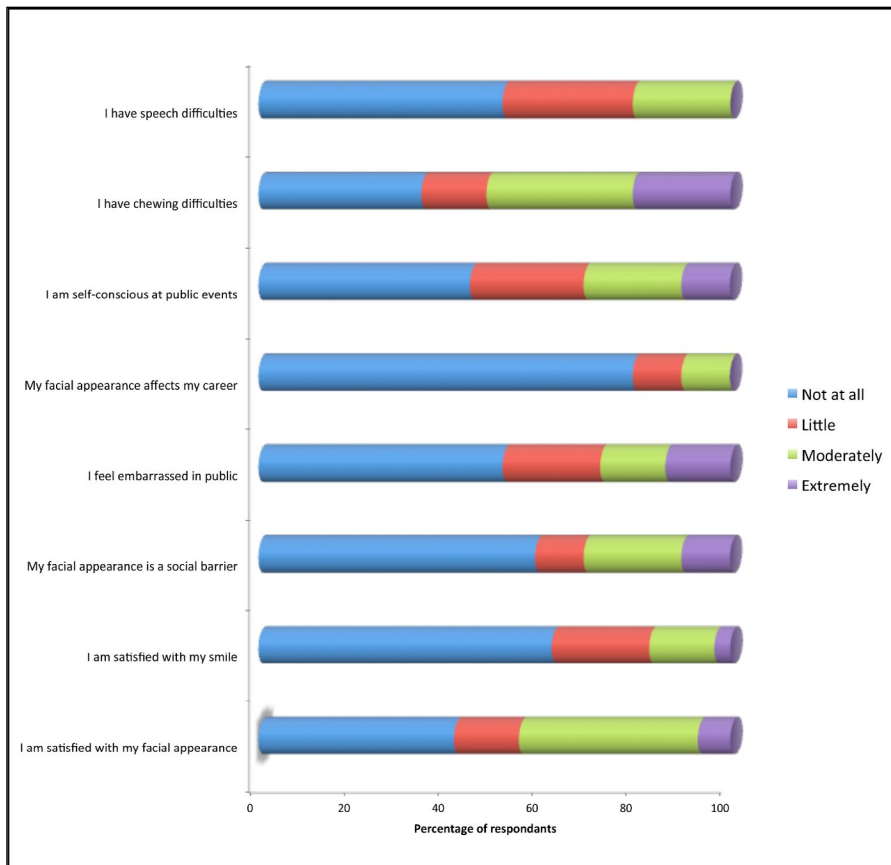
In general, 58,6% of the respondents did not feel that their pre-treatment facial appearance was a social barrier. When separated by gender, 76.5% of the females and 33.3% of the males did not feel that their dentofacial deformity was a social barrier. In addition, 51.7 % of the participants felt that they were not embarrassed at all due to their facial appearance. The majority (79.3%) did not feel that their facial appearance negatively affected their career, and 44.8% did not feel shy or self-conscious at social activities (Figure 1).

In the post-treatment period, only 20.7 % of the participants felt that they were not socially accepted, whereas 55.2% felt that they had improved self-esteem. However, 24.1% still felt that their dentofacial deformity negatively affected their career (Figure 2).

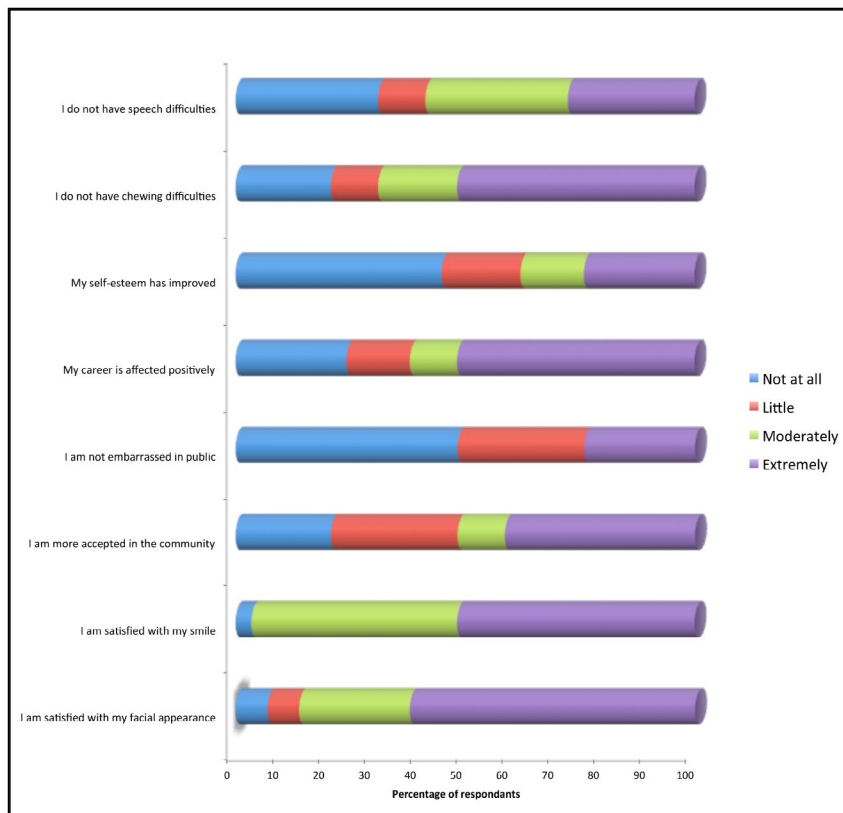
For the male participants, the pre-treatment satisfaction score for the psycho-social section of the questionnaire did not improve in the post-treatment period ( $p < 0.343$ ); however, there was a statistically significant improvement in this score in females ( $p < 0.016$ ) (Table 1).

### Oral Function (speech and mastication)

The majority of males (91.6%) reported some degree of chewing difficulty in the pre-treatment period, whereas only 47% of the females reported these difficulties. Regarding speech, 48.3% of both males and females reported having some degree of speech and pronunciation difficulties (Figure 1).



**Figure 1**



**Figure 2**

In the post-treatment period, 8.3 % of the males and 29.4% of the females felt that there was no improvement in mastication. Regarding speech in the post-treatment period, 16.7% of the males and 41.2% of the females reported that they still had speech

difficulties (Figure 2).

The oral function satisfaction score improved in both females and males ( $p < 0.042$  and  $p < 0.001$ , respectively) (Table 1).

	N	Mean score ± SD	Mean score ± SD	p-value
		Pre-treatment	Post-treatment	
<b>Facial Aesthetics</b>				
<b>All</b>	29	28.16 ± 29.2	81.03 ± 23.0	< 0.001*
<b>Male</b>	12	33.33 ± 34.1	84.72 ± 18.1	0.003*
<b>Female</b>	17	24.51 ± 25.8	78.43 ± 26.2	< 0.001*
<b>Psycho-social</b>				
<b>All</b>	29	25.00 ± 24.0	48.28 ± 27.3	< 0.001*
<b>Male</b>	12	29.17 ± 26.9	41.67 ± 22.8	0.343
<b>Female</b>	17	22.06 ± 22.0	52.94 ± 29.9	0.016*
<b>Oral Function</b>				
<b>All</b>	29	34.48 ± 28.8	59.20 ± 31.7	0.011*
<b>Male</b>	12	50.00 ± 21.3	65.28 ± 21.9	0.042*
<b>Female</b>	17	23.53 ± 28.9	54.90 ± 37.2	0.001*

**Table 1:** Pre- and post-treatment mean satisfaction score and standard deviation of the respondents (from 0 to 100), where 0 is dissatisfied and 100 is completely satisfied. Asterisk denotes statistical significance at  $p < 0.05$ .

## Discussion

In 1999, Phillips stated that a patient-centered approach for examining the outcomes of services is an important supplement to the study of morphological and physiological responses to treatment. The success of treatment must also be defined in the context of the patient's perceptions and beyond traditional health indicators, such as mortality and morbidity (3). The adoption of sociodental values in peoples' lives was addressed by Cohen and Jago in 1976; they stated that among all oral disorders, malocclusions are the most difficult to measure (9). That difficulty may be due to a difference in the professional view in regards to deviation from normal and the cultural values influencing body image, as well as aesthetic knowledge (8).

Orthognathic procedures are considered elective; therefore, they are done only in certain cases that have factors indicating the use of this type of treatment (10). Although these procedures have some risks and complications, over the last 30 years and with advancements in surgical techniques and materials, they have

become routinely preformed (5, 11, 12). The impact of any type of treatment on a patient's QoL has significant influence on the decision to undergo the treatment (13)

Our research aimed to evaluate the quality of different aspects of patients' lives. Esperao et al. used the OHIP-14 and concluded that female patients report a greater impact of their oral status on QoL than male patients (7). In contrast, De Ávila et al. stated that there was no statistically significant difference in relation to gender (14).

The majority of the participants were dissatisfied with their facial appearance and smile in the pre-treatment evaluation. This was more evident in females. This is understandable because females tend to be more open to express concerns and feelings regarding aesthetics and appearance.

Interestingly, the females in our study population felt that their job was affected due to their dentofacial deformity. This again emphasizes the fact that facial appearance has an impact on psycho-social aspects of the female life. Severity of the dentofacial deformity, which was not considered in our study, might have



contributed to this gender difference.

Although post-treatment results suggest improvement in facial appearance and smile satisfaction, a small percentage of respondents still reported dissatisfaction in the post-operative period. This might be attributed to relapse and stability of the results (15, 16), patient's expectations of the treatment, or the severity of the deformity. It is prudent that the expectations of orthognathic surgery be discussed thoroughly with the patient prior to treatment.

Oral function was found to be at the bottom of the patient's concerns, with only a minor percentage of males and females reporting difficulties in chewing and pronunciation. Rustemeyer et al reported that functional problems were usually more neglected or at least placed more in the background (17) This might be explained by the fact that the major motivation for surgical treatment in skeletal malocclusions is aesthetics (18).

Another study found that patients' motivation for orthognathic surgery was dental aesthetics (80% of the participants), prevention of dental problems (69% of the participants), and improved self-confidence (68% of the participants). Females sought treatment to improve self-confidence and their smile, while males wanted treatment to improve their social life (19). Another study stated that the most important factors in encouraging patients who undergo treatment with orthognathic surgery are improvement in aesthetics and correction of function (10).

Finally, less than 50% of the female participants and 75% of the male participants would recommend this treatment to others. This shed more light on gender differences in terms of expectations from surgical dentofacial deformity treatment. As each individual orthognathic patient had different motivations, expectations of treatment differed (20).

## Conclusion

In general, a significant improvement occurred in the satisfaction score in both genders between the pre-treatment and post-treatment phases regarding facial aesthetics and oral function. From the psycho-social aspect, only the females showed a significant improvement.

Orthognathic surgery can have a positive effect on the QoL of the patient. Although the surgery may be considered life changing, it is regarded as an elective procedure. A thorough discussion with the patient should occur in the pre-treatment phase to determine the patient's motive and expectations.

Further studies should correlate the magnitude of the dentofacial deformity with the post-treatment QoL.

## Disclosure

The authors do not have any financial or non-financial competing interests to disclose.

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