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Assessment of Satisfaction Following Orthognathic Surgery in Patients with Class II and Class III Dentofacial Deformities

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Abstract

Background

This study aimed to evaluate the postoperative satisfaction levels of patients with skeletal Class II and Class III dentofacial deformities who underwent orthognathic surgery, and to investigate the potential correlations between satisfaction outcomes and sociodemographic variables.

Methods

A total of 97 patients who underwent orthognathic surgery at the Department of Oral and Maxillofacial Surgery, Marmara University, between 2018 and 2022, and for whom at least 6 months had elapsed since the surgery, were evaluated via a questionnaire. Patients were divided into two groups based on the presence of Class II and Class III deformities; satisfaction levels were statistically analyzed within and across the groups, as well as by demographic characteristics.

Results

The overall patient satisfaction rate following orthognathic surgery was 94.8%. The highest satisfaction rates were recorded for speech proficiency (97.9%) and lip posture/closure (92.8%). Conversely, the lowest positive response rate was observed regarding neurosensory changes in the lower lip and chin region (62.8%). No statistically significant differences in satisfaction levels were observed between the Class II and Class III deformity groups ($p > 0.05$). Among the evaluated sociodemographic variables, educational status was the sole factor that demonstrated a statistically significant impact, specifically on speech satisfaction ($p = 0.020$).

Conclusions

Overall patient satisfaction after orthognathic surgery is high. The vast majority of patients expressed a positive attitude toward undergoing the procedure again and would recommend it to others. Although satisfaction with neurosensory recovery remains relatively low, the high overall satisfaction rates indicate that the aesthetic and functional gains may outweigh the negative impact of neurosensory disturbances. Furthermore, the independence of satisfaction levels from most socio-demographic characteristics underlines the predictable and universally beneficial outcomes of orthognathic interventions across diverse patient profiles.

BACKGROUND

Dentofacial anomalies represent complex structural conditions that frequently compromise facial aesthetics, dental occlusion, masticatory efficiency, and speech articulation. Furthermore, these

deformities are often associated with temporomandibular joint (TMJ) disorders, challenges in maintaining optimal oral hygiene, and subsequent psychosocial distress, which collectively diminish the patient's overall quality of life. Orthognathic surgery combined with orthodontic treatment is an important intervention to address these anomalies, providing rapid and substantial improvements in mastication, deglutition, speech, and respiratory functions, while concurrently optimizing facial aesthetics (1–3). The postoperative restoration of these essential functions accelerates the patient's reintegration into daily activities and promotes a significant enhancement in psychological well-being. These positive changes directly correlate with psychosocial benefits, including elevated self-esteem and heightened self-confidence (3–5). Consequently, a vast majority of patients undergoing orthognathic surgery report highly favorable surgical outcomes and high postoperative satisfaction.

However, the literature also emphasizes that patients undergo complex functional, aesthetic, and psychological adaptations throughout the postoperative period. Comprehensive data addressing specific patient-centered needs during this transition remain limited (6). Therefore, structured postoperative evaluations are crucial to better comprehend patient experiences, refine perioperative care protocols, and maximize long-term quality of life (3).

Currently, there is a notable inconsistency in the literature regarding patient satisfaction rates following orthognathic interventions; while numerous studies report overwhelmingly positive outcomes, others highlight substantial levels of patient dissatisfaction (7).

Furthermore, while international literature on this subject is substantial, comprehensive data evaluating patient satisfaction within the Turkish population—particularly regarding distinct functional and aesthetic parameters such as occlusal stability, speech, lip posture, respiration, pain management, and neurosensory function—remain scarce. Additionally, evidence exploring the direct relationship between sociodemographic determinants and specific satisfaction domains is limited. To address these gaps, the present study aimed to comprehensively investigate the postoperative satisfaction levels among Turkish patients who underwent orthognathic surgery for Class II and Class III dentofacial deformities at a major metropolitan tertiary center, while concurrently evaluating the influence of sociodemographic factors on these outcomes.

METHODS

Study Design and Ethical Approval

This retrospective, cross-sectional study was approved by the Marmara University Faculty of Dentistry Clinical Research Ethics Committee (Approval No: 2023/165) and conducted in accordance with the principles of the Declaration of Helsinki. Participation in the survey was voluntary, and informed consent was obtained from all participants prior to their participation in the study.

Patient Selection and Eligibility Criteria Medical records and archival data of patients who underwent orthognathic surgery at the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Marmara

University, between January 2018 and December 2022 were retrospectively reviewed.

Inclusion Criteria: Patients diagnosed with initial skeletal Class II or Class III malocclusions; individuals who underwent bimaxillary orthognathic surgery; a minimum postoperative healing period of 6 months to ensure that transient early postoperative complications did not bias survey responses; and the absence of cognitive or communication impairments.

Exclusion Criteria: Patients aged 45 years or older at the time of surgery, and individuals who provided incomplete questionnaire responses.

Out of the screened cohort, 97 patients met the eligibility criteria and were included in the final analysis. The study population was stratified into two primary groups based on the definitive diagnosis of dentofacial deformity: Class II and Class III.

Data Collection Tools

Data collection was executed using two distinct survey instruments:

Patient Data Form: A customized demographic questionnaire designed to record baseline sociodemographic characteristics, including age, gender, educational level, income status, marital status, and employment status.

Satisfaction Survey: A modified 9-item satisfaction questionnaire originally developed by Kiyak et al. (8) The instrument utilizes a 7-point Likert scale to evaluate distinct dimensions of patient perception. For analytical purposes, responses were categorized into three tiers: scores of 1–3 were classified as negative, a score of 4 was defined as neutral, and scores of 5–7 were classified as positive.

The survey structure is divided into two primary dimensions:

Qualitative/General Perceptions: Evaluating overall postoperative satisfaction, willingness to undergo the surgical procedure again, and willingness to recommend the surgery to other patients.

Quantitative/Functional Parameters: Assessing patient satisfaction regarding dental occlusion/bite, speech proficiency, lip posture/closure, respiratory function, pain experience, and neurosensory sensation. Prior to administration, the survey items were audited and validated for clinical relevance and clarity by a panel of expert senior oral and maxillofacial surgeons. The complete questionnaire is presented in Supplementary 1.

Statistical Methods

Data were analyzed using IBM SPSS V23 software. The Fisher Exact Test, Fisher-Freeman-Halton Test, and Pearson Chi-Square Test were used to compare the distributions of responses according to sociodemographic characteristics. Normality of distribution was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk Tests. For comparing scale scores that did not follow a normal distribution in

binary groups, the Mann-Whitney U and Kruskal-Wallis H tests were used. Analysis results were presented as frequencies (percentages) for categorical data and as means ± standard deviations and medians (minimum-maximum) for quantitative data. Results were evaluated at a significance level of $p < 0.05$.

RESULTS

Demographic Characteristics

The clinical and demographic characteristics of the 97 participants are detailed in Table 1. The study sample comprised 55 females (56.7%) and 42 males (43.3%). The vast majority of the cohort reported a middle-income status (83.5%) and possessed a university degree (71.1%). Regarding marital and employment status, 80.4% of the participants were single and 68.0% were actively employed. Age distribution analysis showed that 41.2% of the patients fell within the 18–24 age range, while 58.8% were 25 years of age or older (Table 1).

Table 1
Frequency and percentage distributions of demographic data

Gender	Frequency	Percentage
Male	42	43,3
Female	55	56,7
Income Level		
Low	11	11,3
Medium	81	83,5
High	5	5,2
Education Level		
Elementary School	5	5,2
High School	14	14,4
University	69	71,1
Master's	9	9,3
Marital Status		
Single	78	80,4
Married	19	19,6
Employment Status		
Employed	66	68
Unemployed	31	32
Age		
18–24	40	41,2
25 and older	57	58,8

Distribution of Questionnaire Responses

The study included 32 patients diagnosed with skeletal Class II deformities and 65 patients with Class III deformities. An inter-group comparison revealed high rates of positive responses across both deformity groups. No statistically significant differences were detected between Class II and Class III patients across any of the surveyed items ($p > 0.05$). Nonetheless, Class III patients descriptive rates of

satisfaction were higher, particularly regarding occlusion, speech proficiency, lip posture, and respiratory parameters. Conversely, both cohorts reported the lowest satisfaction scores for Question 9, which assessed lower lip and chin neurosensory sensation. Detailed question-response distributions are detailed in Supplementary Table 2.

Table 2
Distribution of questions by educational level

	Educational level				Test Statistic	p
	Elementary School	High School	University	Graduate School		
Question 1 (Repeat Surgery)						
Negative	0 (0)	2 (14, 3)	4 (5, 8)	1 (11, 1)	5,079	0,61*
Neutral	0 (0)	0 (0)	1 (1, 4)	0 (0)		
Positive	5 (100)	12 (85,7)	64 (92,8)	8 (88,9)		
Question 2 (Surgery Recommendation)						
Negative	0 (0)	1 (7, 1)	3 (4, 3)	1 (11, 1)	5,823	0,355*
Neutral	1 (20)	0 (0)	2 (2, 9)	0 (0)		
Positive	4 (80)	13 (92,9)	64 (92,8)	8 (88,9)		
Question 3 (Overall Satisfaction)						
Negative	0 (0)	0 (0)	2 (2, 9)	1 (11, 1)	8,018	0,211*
Neutral	1 (20)	0 (0)	1 (1, 4)	0 (0)		
Positive	4 (80)	14 (100)	66 (95,7)	8 (88,9)		
Question 4 (Closure/Bite)						
Negative	0 (0)	0 (0)	3 (4, 3)	1 (11, 1)	5,737	0,343*
Neutral	0 (0)	3 (21,4)	4 (5, 8)	0 (0)		
Positive	5 (100)	11 (78,6)	62 (89,9)	8 (88,9)		
Question 5 (Speech) Negative	0 (0)	0 (0)	0 (0)			

	Educational level				Test Statistic	p
	Elementary School	High School	University	Graduate School		
Neutral	1 (20)	0 (0)	0 (0)	1 (11, 1)	9,367	**0,020***
Positive	4 (80)[a]	14 (100)[ab]	69 (100)[b]	8 (88,9)[a]		
Question 6 (Lip Posture)						
Negative	0 (0)	0 (0)	1 (1, 4)	1 (11, 1)	6,867	0,262*
Neutral	1 (20)	0 (0)	4 (5, 8)	0 (0)		
Positive	4 (80)	14 (100)	64 (92,8)	8 (88,9)		
Question 7 (Breathing)						
Negative	0 (0)	0 (0)	3 (4, 3)	0 (0)	3,861	0,612*
Neutral	1 (20)	0 (0)	4 (5, 8)	0 (0)		
Positive	4 (80)	14 (100)	62 (89,9)	9 (100)		
Question 8 (TMJ/facial pain)						
Negative	0 (0)	0 (0)	3 (4, 3)	1 (11, 1)	3,999	0,584*
Neutral	1 (20)	1 (7, 1)	5 (7, 2)	0 (0)		
Positive	4 (80)	13 (92,9)	61 (88,4)	8 (88,9)		
Question 9 (Sensation)						
Negative	1 (20)	2 (14, 3)	13 (18,8)	4 (44,4)	4,572	0,579*
Neutral	1 (20)	3 (21,4)	12 (17,4)	0 (0)		
Positive	3 (60)	9 (64,3)	44 (63,8)	5 (55,6)		

** Fisher-Freeman-Halton Test; a-b: There is no difference between groups sharing the same letter.*

When analyzing the survey items based on sociodemographic variables, a statistically significant association was identified exclusively between educational attainment and satisfaction with speech

proficiency ($p = 0.020$, Table 2). Post-hoc pairwise comparisons revealed that this significant variance was prominent between university graduates and cohorts holding either elementary school or postgraduate degrees. Comparisons of survey responses across income levels, marital status, employment status, and age groups revealed uniformly high positive satisfaction rates. No statistically significant correlations were found between these demographic parameters and the distribution of survey answers ($p > 0.05$). Descriptively, higher rates of positive responses for specific items were observed among female participants, single individuals, and unemployed/student cohorts.

The overall satisfaction rate for the complete sample was 94.8%. The highest levels of positive responses were achieved for speech satisfaction (97.9%), lip posture and competence (92.8%), and willingness to undergo the procedure again or recommend it to others (91.7%). Satisfaction regarding occlusal/masticatory alignment and tolerance of TMJ/facial pain was 88.6%. Neurosensory perception of the lower lip and chin yielded the lowest positive response rate (62.8%), demonstrating a substantially higher negative response rate (20.6%) compared to all other parameters ($p < 0.05$).

Comparison of Satisfaction Scores

Global satisfaction scores were systematically aggregated and compared across classification groups, gender, income, education, marital status, employment status, and age brackets. No statistically significant variances in cumulative satisfaction scores were established for any of the investigated clinical or demographic factors ($p > 0.05$, Table 3). These findings corroborate that overall patient satisfaction remained uniformly elevated across the entire study cohort.

Table 3
Comparison of satisfaction scores by demographic characteristics

Classification	Mean ± SD	Median (Min–Max)	Test Statistic	p
Class II	2,8 ± 0,28	2,89 (1,67 – 3)	1198	0,196*
Class III	2,85 ± 0,28	3 (1,44 – 3)		
Gender				
Male	2,81 ± 0,34	2,89 (1,44 – 3)	1169,5	0,910*
Female	2,85 ± 0,23	2,89 (1,67 – 3)		
Income Level				
Low	2,89 ± 0,17	3 (2,44 – 3)	0,685	0,710**
Medium	2,82 ± 0,3	2,89 (1,44 – 3)		
High	2,91 ± 0,12	3 (2,78 – 3)		
Educational Level				
Elementary School	2,8 ± 0,23	2,78 (2,44 – 3)	0,517	0,915**
High School	2,87 ± 0,17	2,94 (2,56 – 3)		
University	2,84 ± 0,28	2,89 (1,44 – 3)		
Master's	2,74 ± 0,44	3 (1,67 – 3)		
Marital Status				
Single	2,84 ± 0,26	2,89 (1,44 – 3)	686,5	0,597*
Married	2,8 ± 0,34	2,89 (1,56 – 3)		
Employment Status				
Employed	2,82 ± 0,32	2,94 (1,44 – 3)	1004	0,875*
Unemployed	2,86 ± 0,17	2,89 (2,33 – 3)		
Age				
18–24	2,84 ± 0,25	2,89 (1,67 – 3)	1137	0,981*
25 and older	2,83 ± 0,3	2,89 (1,44 – 3)		

*Mann-Whitney U Test; **Kruskal-Wallis H Test; Mean ± standard deviation; Median (minimum–maximum)

DISCUSSION

Patient-reported satisfaction following orthognathic surgical interventions is intrinsically multidimensional. It depends not only on the technical precision and execution of the surgical plan by the maxillofacial team but also on subjective postoperative experiences, individual coping mechanisms, and the realistic fulfillment of preoperative expectations. Modern patient-centered healthcare paradigms increasingly prioritize the patient's subjective perception alongside objective clinical and radiographic criteria when defining surgical success (2, 9).

Consistent with prevailing epidemiological trends in orthognathic literature, the majority of the current study population presented with skeletal Class III deformities. This predominant presentation may be attributed to the fact that individuals with Class III malocclusions frequently experience severe aesthetic compromises and profound functional masticatory limitations, which increases their motivation and willingness to seek definitive surgical corrections (10).

Patient satisfaction following orthognathic surgery is generally reported to be high in the literature. Our findings confirm this trend, showing an overall satisfaction rate of 94.8%, which aligns well with international benchmarks. Nonetheless, significant variations across different study cohorts remain evident (7). For instance, while prior investigations report that between 63.0% and 92.3% of patients would recommend orthognathic treatment to others our cohort presented a recommendation rate near the top of this range at 91.7%. Similarly, 91.7% of our patients stated they would choose to undergo the same surgical procedure again if given the option, which aligns with rates reported in the literature (11) These fluctuations suggest that patient satisfaction is a dynamic process influenced by baseline psychological profiles, individual expectations, and the specific psychometric tools utilized across different clinical settings (9).

The capacity of orthognathic surgery to substantially optimize oral function is well established (12, 13). In the present study, the 88.6% satisfaction rate regarding dental occlusion and chewing indicates that the functional goals of treatment were successfully met for most patients. Furthermore, while patients frequently express preoperative anxiety regarding potential speech deterioration, 97.9% of our cohort reported high satisfaction with postoperative speech articulation. This confirms that speech proficiency is preserved or enhanced after surgical jaw repositioning, supporting prior studies that report no long-term adverse effects on articulation (14, 15). Such high satisfaction levels highlight that orthognathic correction offers substantial communication and social benefits alongside functional gains. Interestingly, few studies have explicitly evaluated the correlation between lip posture/closure and patient satisfaction (15). The high satisfaction rate regarding lip architecture (92.7%) observed in our study suggests that prioritizing soft tissue harmony provides multifaceted aesthetic benefits to the patient. Additionally, the high rate of positive respiratory outcomes (91.7%) underscores the wider physiological value of orthognathic interventions, particularly bimaxillary advancements. Neurosensory alteration due to surgical manipulation of the inferior alveolar and infraorbital nerves remains a primary postoperative complication in orthognathic surgery. In our sample, while 88.6% of patients reported

postoperative TMJ/facial pain as tolerable, a small percentage rated it as neutral (7.2%) or intolerable (4.1%). More notably, temporary paresthesia or numbness in the lower lip, chin, and gingival tissues frequently occurs. Although objective neurosensory recovery usually begins within weeks, subjective sensory alterations can persist over a longer period (15). Importantly, our study showed that 20.6% of patients who expressed dissatisfaction with their neurosensory recovery still reported high overall postoperative satisfaction. This indicates that patients prioritize structural, functional, and facial aesthetic improvements over minor neurosensory deficits when evaluating their overall surgical outcome. Demographically, our study included a higher proportion of female patients (56.7%) than male patients (43.3%), corroborating evidence that women seek orthognathic correction more frequently (16). Literature suggests that while male patients prioritize functional improvements such as mastication, female patients often present with distinct aesthetic motivations (12). Because bimaxillary orthognathic surgery concurrently satisfies both functional and aesthetic criteria, postoperative satisfaction scores were high across both genders (Male: 88.1%; Female: 89.67%), with no statistically significant differences found. Similarly, the high percentage of single individuals (80.4%) in our sample reflects young adult cohorts who place higher importance on facial appearance during key psychosocial stages of life (16). Although single patients descriptively reported higher satisfaction levels, matching some previous trends (1) the difference between married and single patients was not statistically significant ($p > 0.05$). The single sociodemographic variable that demonstrated a statistically significant impact on a specific satisfaction domain was educational attainment, which correlated with speech satisfaction ($p = 0.02$). Statistically significant differences were identified between university graduates and those holding either elementary school or postgraduate degrees. This variance likely stems from the descriptive imbalances in our sample distribution and the unique sociocultural diversity of Istanbul, where different professional and educational environments may dictate distinct communication needs and expectations

CONCLUSION

Bimaxillary orthognathic surgery yields high overall patient satisfaction rates among individuals presenting with skeletal Class II and Class III dentofacial deformities. Satisfied patients demonstrate a highly favorable attitude toward recommending the procedure to others and would choose to undergo the surgery again. Although subjective satisfaction with neurosensory recovery is comparatively lower, it does not significantly compromise global patient-reported outcomes. This confirms that substantial aesthetic and functional improvements successfully compensate for potential neurosensory disturbances. Furthermore, high satisfaction scores in less frequently assessed parameters—such as lip posture, lip competence, and speech articulation—highlight the comprehensive benefits of these surgical interventions. Finally, because postoperative satisfaction levels are largely independent of sociodemographic factors, orthognathic surgery can be considered a highly predictable and widely beneficial treatment modality across diverse patient populations.

Limitations of the Study

The primary limitations of this study include its retrospective, single-center design and an unequal sample size distribution between the Class II and Class III groups. These factors may have limited the statistical power required to detect subtle differences between the deformity cohorts. Future prospective, multi-center studies utilizing standardized quality-of-life instruments are recommended to validate these findings on a broader scale.

Abbreviations

TMJ
temporomandibular joint

Declarations

Ethics approval and consent to participate

This study was approved by the Marmara University Faculty of Dentistry Clinical Research Ethics Committee (Approval No: 2023/165) and was conducted in accordance with the principles of the Declaration of Helsinki. Participation in the survey was voluntary, and informed consent was obtained from all participants prior to their participation in the study.

Consent for publication

Not applicable.

Clinical trial number

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

AO and OA designed the study. AO collected the data, performed the analyses, interpreted the findings, and wrote the manuscript. OA critically reviewed the manuscript and contributed to its final revision. All authors read and approved the final manuscript.

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Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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