

Research Article

A Multifaceted Survey On The Quality Of Life Of Patients Having Orthognathic Surgery.

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Abstract

Dentofacial abnormalities are corrected by orthognathic surgery (OGS), which enhances appearance and functionality. Although earlier studies indicate beneficial effects on psychosocial well-being, self-esteem, and quality of life (QoL), there is still a lack of a thorough evaluation that takes emotional stability and depressive symptoms into account. The psychological and social impacts of OGS, such as indication-specific quality of life, self-esteem, depression, and emotional stability, were to be assessed in this study. Techniques: The Orthognathic Quality of Life Questionnaire (OQLQ), FACE-Q, Rosenberg Self-Esteem Scale (RSES), Freiburg Personality Inventory (FPI), and Patient Health Questionnaire-9 (PHQ-9) were validated questionnaires used in a cross-sectional investigation. Ninety individuals who have received OGS at one facility provided the data. The findings were contrasted with reference studies and normative data on patients before and after OGS and facial surgeries performed solely for aesthetic purposes. Findings: In every OQLQ domain, postoperative patients showed noticeably better quality of life. High satisfaction with face function and appearance was indicated by FACE-Q scores, which were consistent with reference research. The study group had mostly balanced emotional stability and higher self-esteem scores than the general population ($p < 0.001$). However, compared to normative data, the study group had a higher prevalence of depressed symptoms, especially among male participants ($p < 0.001$). Conclusions: The results support the favorable psychological effects of OGS by indicating that it significantly enhances QoL, self-esteem, and emotional stability. Nonetheless, a subset of patients' continued depressive symptoms emphasizes the necessity of psychological assistance throughout treatment. Future longitudinal research is required to validate long-term benefits and improve patient care because of the cross-sectional approach.

Keywords : orthognathic surgery; quality of life; Rosenberg Self-Esteem Scale; depression; emotionality; patient reported outcomes; survey.

INTRODUCTION

Orthognathic surgery (OGS) improves function and attractiveness by realigning the teeth and skeleton. OGS has been demonstrated to enhance quality of life (QoL) in a number of ways and is typically used on patients with severe dentofacial abnormalities that cannot be addressed with orthodontics alone [1,2].

Since QoL and patient satisfaction are multifaceted concepts that encompass psychological, physical, and social domains as subjectively perceived by the individual, as well as the complex interactions between sensations, expectations, experiences, satisfaction, physical and emotional aspects, and social well-being, evaluating them is extremely difficult [3–6]. Orthognathic treatments can enhance self-confidence, body image, and social adjustment [2,8–10], and research indicates that dental appearance affects personality perceptions [7]. Furthermore, research has highlighted how people with and without dentofacial abnormalities perceive their quality of life differently [11–14]. A thorough assessment needs to take function, aesthetics, and social and psychological aspects into

account [15]. Commonly used validated instruments include the Short Form Health Survey (SF-36), Oral Health Impact Profile Questionnaire-14 (OHIP-14), and Orthognathic Quality of Life Questionnaire (OQLQ) [16]. The Rosenberg Self-Esteem Scale and interviews are additional techniques [17, 18]. Few studies have evaluated OGS patients' mental, physical, and social health, including emotional stability, depression, and self-esteem. PROMs, or patient-reported outcome measures, are still not widely used. The viability of multidimensional assessment techniques in various patient populations has been demonstrated by extensive research on QoL in plastic surgery [19–24], and this might potentially be applied to OGS. The purpose of this cross-sectional study was to assess how OGS affected patients with Class II and III dentofacial abnormalities' quality of life, self-esteem, depression, emotional stability, and patient-reported outcomes (PROs). The study also aimed to compare these results with data from the general population and the body of existing literature. The authors postulated that, when compared to the general population and, specifically, to patients before to therapy, OGS has a beneficial impact on multidimensional quality of

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Received: 15-Jan-2025, ; **Editor Assigned:** 17-Jan-2025 ; **Reviewed:** 06-Feb-2025, ; **Published:** 16-Feb-2025,

Citation: AnneKarin Bär. A Multifaceted Survey on the Quality of Life of Patients Having Orthognathic Surgery. *Advances in Plastic Surgery*. 2025 February; 1(1).

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life and enhances all areas studied. Evaluating the viability and the amount of work and strain patients would have to endure in order to organize a prospective research in the future was a secondary goal.

RESOURCES AND PROCEDURES

Research Subjects

From July 2010 to July 2020, consecutive patients who had OGS at the Department of Oral and Maxillofacial Surgery, Federal Armed Forces Hospital Koblenz, Germany, at various postoperative time periods were included in this cross-sectional study. Patients between May and September of 2021 were asked to freely participate. Ninety of the 254 patients that qualified were included. All patients had fully healed and were back to their regular social, professional, and everyday activities at the time of data collection.

Criteria for Inclusion and Exclusion

Skeletal dentofacial abnormalities of Class II or III were present in eligible individuals. They either had bimaxillary surgery (BSSO and Le Fort I) or single-jaw surgery (bilateral sagittal split osteotomy (BSSO), Le Fort I osteotomy). Cleft lip and palate, craniofacial disorders, and trauma-related face malformations were among the exclusion criteria.

Surgical Intervention and Aftercare

The operations were carried out by five skilled surgeons. Orthodontic treatment was managed by referring orthodontists both before and after surgery. For internal fixation, titanium miniplate osteosynthesis was employed. The removal of the orthodontic appliance or 6–9 months after surgery, which usually corresponds with the removal of the miniplate, marked the end of routine follow-up.

Information Gathering

Six questionnaires were used to gather data: five validated instruments, the OQLQ [25], FACE Q [26–29], Rosenberg Self-Esteem Scale (RSES) [30], Freiburg Personality Inventory (FPI) [31], and Patient Health Questionnaire-9 (PHQ-9) [32,33], in addition to a self-developed, indication-specific questionnaire. Prior research has employed a comparable set of questionnaires [20–24]. Participants' post-operative assessment times ranged from six months to ten years. This variability was taken into account while interpreting the data, recognizing that the amount of time that has passed since surgery may have an impact on patient-reported outcomes. Participants who had not returned their questionnaires were contacted by phone following two mail reminders. Ninety of the 154 people who initially consented returned questionnaires that were either fully or partially filled out.

Surveys

The self-created survey evaluated treatment satisfaction, surgical concerns, and demographic and socioeconomic characteristics. All of the questions are in the Supplementary Materials. Participants in the study had to respond to 91 questions in total, which came from both the validated and self-developed questionnaires.

Questionnaire on Orthognathic Quality of Life

Social aspects, face aesthetics, oral function, and knowledge of dentofacial aesthetics are the four areas covered by the 22 items that make up the OQLQ. A 4-point Likert scale was used to grade each issue; higher scores denoted a lower quality of life [25]. Two more questions (OQOL-G) were included for the German version [34].

FACE-Q

Over 40 separate scales and checklists make up the FACE-Q, a comprehensive PROM tool that assesses a range of factors related to patient experience of care, quality of life, adverse effects, and facial appearance [26]. A distinct score on a 3- or 4-point Likert scale is provided by each measure. Orthognathic-relevant FACE-Q scales were chosen for this study: 10 questions on "satisfaction with facial appearance overall," 5 questions on "satisfaction with lower face and jawline," and 8 questions on "social function" from the "quality of life" domain. The first two scales have response possibilities ranging from "very dissatisfied" to "very satisfied" (scores range from 5 to 20 and 10 to 40, respectively). "Definitely disagree" to "definitely agree" are the possible answers on the "social function" scale (score range: 8–32). Rasch-transformed scores (0–100), where higher scores indicate greater satisfaction, were created from raw data because they are non-linear [35]. Results were compared with two reference studies that validated the Chinese and Cantonese FACE-Q versions in patients with Class II and III dentofacial deformities before and after OGS in order to gauge improvements in patient satisfaction following OGS [36,37]. Additionally, postoperative assessments from a sizable validation study of patients having aesthetic facial operations were used to compare the outcomes [26].

The Rosenberg Scale of Self-Esteem

A 10-item test used to gauge self-esteem is called the RSES [30]. Half of the items are positively written (such as "life satisfaction") and half are negatively worded (such as "feelings of failure"), and responses are recorded on a 4-point Likert scale ranging from "strongly disagree" to "strongly agree." Greater self-esteem is indicated by higher total scores (0–40). Schmitt and Allik's study used German population standards as a reference and supplied generic population data for 53 countries [38].

Personality Inventory of Freiburg

With 138 items broken down into 12 scales—Life Satisfaction, Social Orientation, Achievement Orientation, Inhibition, Excitability, Aggressiveness, Stress, Physical Complaints, Health Worries, Openness, and additional scales for Extraversion and Emotionality—the FPI-R (evised) is a psychological assessment tool that measures personality traits [39]. This study's Emotionality module assesses responses to stress and emotional stimuli. To enable normative comparisons, raw scores were converted based on age and sex groups [31]. Extremely balanced (1–2), balanced (3–7), and unbalanced/hypersensitive (>7) are the three categories for scores.

Questionnaire-9 on Patient Health

The PHQ-9 was used to measure the degree of depression [32, 40]. Responses range from 0 (not at all) to 3 (almost every day), and the nine items match the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for major depressive disorder [41]. Mild (≥ 5), moderate (≥ 10), or severe (≥ 15) depression are indicated by PHQ-9 scores (0–27) [32]. The outcomes were contrasted with German population normative data [42].

Analysis of Statistics

The data were displayed as frequency (%) or mean $\pm$ standard deviation. IBM SPSS Statistics 26.0 (IBM Corp., Armonk, NY, USA) was used for the analyses. For data that was regularly distributed, paired or unpaired t-tests were used, with $p < 0.05$ indicating statistical significance.

Moral Points to Remember

All participants provided written informed consent in line with the Declaration of Helsinki. The local ethics committee gave its approval to the study (No. 2021-15595_1).

FINDINGS

Indication-Specific, Self-Developed Questionnaire

The study had 90 participants in total (dropout rate: 64.6%), of which 44 were female, 42 were male, and 4 were non-binary. The age range was 20–62 years old, with a mean of 33.3 ± 10 years. Bimaxillary jaw surgery ($n = 18$, 20%), Le Fort I ($n = 6$, 7%), or BSSO ($n = 66$, 73%), were used to address dentofacial abnormalities; most of these involved mandibular setback ($n = 38$, 42%). The majority of patients experienced stress related to treatment as expected ($n = 55$, 61.1%). At 22.2% ($n = 20$), it was lower than anticipated, but 16.7% ($n = 15$) had a higher burden than anticipated. Intermaxillary fixation ($n = 44$, 48.9%), nasogastric tube irritation ($n = 43$, 47.8%), and swelling ($n = 40$, 44.4%) were the most often reported issues.

Reduced jaw opening was one of the long-term issues ($n = 13$, 14.4%). The greatest improvements in biting and chewing

($n = 75$, 83.3%), facial profile ($n = 57$, 63.3%), decreased temporomandibular joint pain ($n = 24$, 26.7%), and enhanced pronunciation ($n = 12$, 13.3%) were noted by patients after surgery. Sixty-three patients (71.5%) said they would “definitely” or “probably” have surgery again, while 74 patients (84.1%) expressed extremely or moderate satisfaction with the surgical outcome overall. The Supplementary Materials provide the complete results.

Questionnaire on Orthognathic Quality of Life

The study group's mean OQLQ scores are shown in Table 1 in comparison to the pre-treatment dentofacial deformity patients from the reference study by Bock et al. The research group's scores were in the median range, indicating significant deterioration in a number of QoL categories, such as social aspects, oral function, face aesthetics awareness, and dentofacial aesthetics. In each of the four domains, there were notable variations between the groups. Patients' oral function (MD 4.3), awareness of dentofacial aesthetics (MD 1.9), and social aspects of dentofacial deformities and facial aesthetics (MD 3.0 for each) all improved after OGS (all $p < 0.05$).

FACE-Q

The mean scores for specific FACE-Q scales in the study group are shown in Table 2, along with a comparison to pre- and post-surgical values from reference studies. In every evaluated domain, the research group consistently showed greater results after surgery than the pre-surgical reference populations. For the Look of the Face With a mean post-surgical score of 67.4 ± 19.0 overall, the study group's results were comparable to those found in the reference studies (Su et al.: 68.1 ± 20.4 , Tan et al. Class II: 67.7 ± 20.1 , Class III: 66.9 ± 18.0). The study group's mean score in the Social Self-Confidence category was 62.7 ± 20.6 , which was lower than the post-surgical values reported by Tan et al.'s Class II (68.8 ± 18.8) and Class III (71.6 ± 19.6) groups but higher than the post-surgical score from Su et al. (56.7 ± 23.6). A post-operative mean of 68.1 ± 19.2 was reported by Klassen et al. (2015), a validation research that focused on individuals having merely aesthetic facial treatments [26]. The study group obtained a mean score of 71.5 ± 22.6 for the Lower Face and Jawline, which was in line with Tan et al. (Class II: 69.7 ± 20.9 , Class III: 70.3 ± 20.4) and Su et al. (72.3 ± 21.0). Orthognathic surgery patients typically report more satisfaction with the lower face and jawline compared to aesthetic surgery patients, according to Klassen et al. (2014), who found a lower mean of 60.0 ± 26.0 among patients receiving exclusively aesthetic operations [28].

Personality Inventory of Freiburg

On the FPI's Emotionality scale, the study group's mean score

was 3.6 ± 3.4 , which was much lower than the normative data from the German population as a whole (5.4 ± 3.7 , $p < 0.001$) [31] (Table 3). 46.2% ($n = 30$) of the participants were defined as highly balanced, 33.8% ($n = 22$) as very balanced, 10.8% ($n = 7$) as balanced, and 9.2% ($n = 6$) as imbalanced based on their degrees of emotional stability (Figure 1). These results show that while a smaller percentage of the study group exhibited mild to moderate emotional instability, the majority showed a high degree of emotional stability.

Questionnaire-9 on Patient Health

Compared to the normative data from the German population (2.9 ± 3.5 , $p < 0.001$) [42], the study group's mean PHQ-9 score of 4.2 ± 4.7 was substantially higher (Table 3).

The mean PHQ-9 score for male research participants, when stratified by gender, was 4.6 ± 5.1 , substantially higher than the normative male population (2.7 ± 3.5 , $p < 0.001$). The mean score of 4.0 ± 4.4 for female participants, on the other hand, was higher than the normative female population (3.1 ± 3.5), although it fell short of statistical significance ($p = 0.111$). 37 persons in the study group had minimal symptoms, 17 had mild symptoms, and 1 had significant symptoms, according to a further assessment of depression severity. A majority of the participants were male, and six of them satisfied the criteria for severe depressive disorder.

CONVERSATION

With an emphasis on QoL, self-esteem, depression, emotional stability, and PROs associated with outward appearance, this study sought to assess the effects of OGS on patients with dentofacial abnormalities. The findings show progress in all of these areas, which is in line with earlier studies [8,9]. However, these results should be interpreted cautiously because of the inherent constraints of cross-sectional design.

A multifaceted strategy was used to evaluate many psychosocial aspects, including PROs through the FACE-Q, which offered insightful information about subjective perceptions of surgical outcomes. Validated questionnaires (OQLQ, FACE-Q, RSES, FPI, and PHQ-9) were used. However, individuals' data collecting times varied greatly, ranging from six months to ten years after surgery. This variation might have affected recollection accuracy and patient-reported satisfaction, especially for those who underwent surgery a few years earlier. In order to better understand how psychological adaption and satisfaction change over time, future research should think about stratifying results by establishing postoperative time points.

According to OQLQ scores, patients had moderate deficits in a number of QoL characteristics prior to surgery [2,34]. All OQLQ domains showed notable improvements after surgery, which is consistent with results from systematic reviews

[2,16]. These patterns were supported by the FACE-Q results, which demonstrated improved satisfaction with social function, lower face and jawline, and facial attractiveness after OGS [36,37]. According to reference studies, postoperative improvements in face function and appearance are typically greater for patients who had lower preoperative satisfaction [26, 28]. These findings are supported by the study group's postoperative outcomes.

Compared to the general population, the research group's self-esteem scores were noticeably higher [38]. This result confirms other studies that OGS improves self-esteem, especially in individuals with Class III malocclusions [43,44]. The FPI's measure of emotional stability revealed that individuals had a generally balanced temperament, with a sizable percentage being categorized as emotionally stable. This implies that OGS has beneficial psychological effects in addition to physical repair.

Depressive symptoms were more common in the study group than in the normative population, even if self-esteem and emotional stability had improved [42]. These results are consistent with research showing that depression symptoms continue after OGS [45–47], indicating that psychological factors may play a role in mental health outcomes even after surgery. Male individuals had considerably higher PHQ-9 scores than their normative counterparts ($p < 0.001$), but female participants did not exhibit a significant difference, even though the mean depression score was within the minimal range. Given that preoperative psychological circumstances, coping strategies, and cultural expectations may all play a role in these findings, this gender disparity merits more investigation. Future research should try to identify the root reasons of these differences and determine whether providing male patients with specific preoperative psychological care could lessen their propensity for depression. Among the many drawbacks of this study is its cross-sectional design, which makes it impossible to determine causality. Although a consistent surgical approach was guaranteed by the participation of five skilled surgeons, treatment consistency may have been impacted by the variation in referring orthodontists overseeing orthodontic treatment before and after surgery. Interpreting the results requires taking into account the sample's heterogeneity. The social, emotional, and psychological backgrounds of the patients varied, as did the length of time it took them to recover from surgery. These elements contribute possible confounders while also increasing the study's complexity. To increase the findings' generalizability, future research should strive for more stratified analyses or adjust for these characteristics. The high dropout rate (64.6%), which was probably caused by the questionnaire's complexity (91 items), was another significant drawback. Alternative data collection techniques, including shorter, adaptive electronic surveys, should be investigated

in future studies in order to increase participation rates and data completeness while preserving measurement accuracy. Furthermore, prospective longitudinal research is required to evaluate long-term psychological effects and offer more profound understanding of the long-term effects of surgical procedures.

All things considered, this study demonstrates the complex effects of OGS on patients' social and psychological health. With the exception of depressive tendencies, the results lend credence to the idea that OGS significantly enhances emotional stability, self-esteem, and quality of life.

CONCLUSIONS

The psychological and social impacts of OGS on individuals with dentofacial abnormalities are thoroughly evaluated in this study. The results show notable gains in emotional stability, self-esteem, and quality of life after surgery. Furthermore, similar to the postoperative outcomes seen in the research group, reference studies show that patients with lower preoperative satisfaction typically see larger postoperative improvements in face function and attractiveness. A subgroup of patients' continued depressive symptoms, however, may indicate the need for additional psychological care during the course of treatment. Even though the study confirms the benefits of OGS, its cross-sectional design and sample size restrictions show that more longitudinal research is required to fully comprehend long-term effects. Future research should prioritize enhancing sample representativeness and lowering patient burden in questionnaire-based investigations. Enhancing the general wellbeing of patients receiving OGS, improving treatment regimens, and improving patient care all depend on these insights.

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