

Clinical Paper Orthognathic Surgery

Perceptions of preoperative expectations and postoperative outcomes from orthognathic surgery: Part I: Turkish female patients

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Abstract. This study was conducted in Turkish female patients to investigate their preoperative concerns, motivation, expectations, preoperative preparation for surgery and perception of outcomes concerning orthognathic surgery. Thirty women, with an age range of 18 to 31 years (mean age 21.8 ± 3.8 years), participated in the study. The expectations and the results of orthognathic treatment were assessed based on the patients' subjective appraisal. Patients completed questionnaires before and after the operations, designed to investigate the preoperative and postoperative psychological impact of the surgery, the perception of problems with physical and psychological functioning, self-image, body image and satisfaction with surgical outcome. The questionnaires were evaluated statistically with SPSS 11.5 for Windows. The patients' perception of their psychological improvement, faith in the surgical team, physical functioning, self-esteem, social confidence, body image and satisfaction after dentofacial correction were higher than the preoperative levels. The conclusions of the study support the theory that enhancement of facial appearance by orthognathic surgery improves the psychological status of females with growth disturbances of the jaw.

Keywords: psychological assessment; orthognathic surgery; preoperative/postoperative perception; female patients.

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Physical attractiveness is directly related to desirability¹. The face is potentially one of the most attractive parts of the body, so a desire to improve it is understandable. The most common motives given by patients for seeking orthognathic surgery are to improve

social acceptance, to increase their chances of marriage, and to correct facial disfigurement that causes public attention and has a negative effect on their personality^{1,3}.

Facial alteration by orthognathic surgery enhances physical attractiveness,

which influences the reactions of society². Dentofacial deformity affects the patients' quality of life in the community⁶. It worsens socialization and causes problems in finding an occupation, dating and marriage⁷. Patients who have psychosocial

problems as a result of their dentofacial deformity are reasonable candidates for orthognathic surgery¹³.

Orthognathic surgery often results in remarkable changes in facial profile¹⁰. Improvements in facial appearance after surgical correction improve psychosocial adjustment^{5,10,11}. The most common motives specified by patients for seeking cosmetic surgery are a desire for social acceptance, improvement of career opportunities, modification of negative facial characteristics that cause self-consciousness and unwanted attention, and a life-changing event, such as divorce⁹⁻¹³.

Satisfaction and the perception of surgical outcome depend on the patient's preoperative expectations and the degree to which the procedure is explained by the operating staff^{11,12,15,17}. Preoperative mood is an important factor that influences postoperative perceptions of recovery and satisfaction^{15,18}. Postoperative anxiety, distress and negative mood are increased by unanticipated events, such as prolongation of intermaxillary fixation, pain or extensive edema^{3,20}.

Preoperative explanations and emotional preparation, which aid psychological adjustment in a difficult period with a rate of slow recovery, are critical before the surgery^{4,17,18,20}. Postoperative psychological well-being is related to the success of surgery, the short healing time and optimal oral functioning¹⁹.

The focus of this study was to assess the psychological status of Turkish female patients who underwent single and double-jaw orthognathic surgery. The study was conducted in three parts: evaluating preoperative expectations and concerns; preoperative preparation for orthognathic surgery; postoperative results and outcome from orthognathic treatment.

Materials and Methods

30 female patients with dentofacial deformities were scheduled for orthognathic surgery and received questionnaires designed to assess the preoperative and postoperative psychological impact of the surgery. The patients were aged between 18 and 31 years (mean age 21.8 ± 3.8 years) with developmental antero/posterior and vertical skeletal maxillofacial deficiency.

They had been advised to have orthognathic surgery for mandibular hypoplasia-hyperplasia, maxillary hypoplasia-hyperplasia, anterior open bite, facial asymmetry and various combinations of maxillo-mandibular skeletal discrepancies. Double-jaw ($n=21$), bilateral sagittal split

(BSSO) ($n=6$), Le Fort I ($n=4$) osteotomies and genioplasties ($n=5$) were the operations performed. Two of the patients in the BSSO group underwent surgery for symptoms of severe dysfunction of the temporomandibular joint. Orthodontic treatment continued on average for 8 months postoperatively.

The study was conducted on patients who underwent surgery between 2000 and 2006. All patients were invited to participate in their presurgical consultation appointments. The questionnaires were given before and approximately 1 year after surgery to eliminate stress factors on the patients' well-being such as the discomfort of orthodontic hardware and the negative impact of postoperative complications, such as lip numbness, edema or limited mouth opening and chewing capacity. Approval for the study was given by the Research Ethics Committee of the Institutional Review Board at Marmara University and all participants (and legal guardians if under the age of 18 years) gave signed informed consent.

Psychological Evaluation

The questionnaire was designed to assess the patients' perceptions of preoperative and postoperative periods in two sections. It was adapted from the Maslach Burnout Inventory¹⁹ and Kiyak's personal inventory with American patients^{15,16}. The items of both instruments were designed to investigate the psychological levels and to assess the perception of the women. Numerous established scales were reviewed but none of them was used completely.

The questionnaire was composed of 154 questions designed to measure problems with oral functioning, general health, appearance and interpersonal relationships. It was structured to recall their current feelings before and after surgery. That was done to assess their comparative perception of changes versus stability in each problem area, such as occlusion, facial appearance, psychological status and oral function.

The survey was constructed in two subscales. The 104 items in the first subscale assessed emotional distress and psychological status before surgery, preoperative expectations and the patients' perception of orthognathic surgery. The main items in the preoperative section included anxiety/distress, preoperative explanation of surgical procedures, psychological relaxation of a participant after having an interview with an operated patient, postoperative

complications, trust in the surgical team, and family support.

The second subscale concerned the postoperative period with 50 questions about adjusting to their new profile, satisfaction with healing, considering re-operation, recommending orthognathic surgery to other patients, anxiety/distress, patients' opinion about their body image, depression after surgery, satisfaction with surgical outcome, improvement in their concept of beauty, increase in self-confidence and improvement in social relations.

The second subscale of the inventory was given to the patients 1 year after surgery to ensure continuity in the responses and to prevent any bias. Major postsurgical sequelae (edema, paresthesia, mastication and speech problems) have generally disappeared by then. To prevent overstatements, patients were asked to be realistic when completing the questionnaire. The examiner was a neutral person whose main responsibilities were to minimize response bias and to ensure completion of all items.

Statistical Analysis

Descriptive statistics and Pearson correlation coefficients (SPSS 11.5 for Windows) were calculated to assess simple bivariate relationships between the following variables: adequate explanation of operation, psychological preparation for surgery, dialogue with an operated patient, trust in surgical team, acknowledgement of postoperative problems, family support, being ready for surgery, difficulty in getting used to postoperative appearance, satisfaction with healing, re-operation, recommending surgery to other patients, anxiety/distress, improvement of postoperative appearance, satisfaction with postoperative body image, improvement in self-confidence, improvement in concept of beauty and improvement in social life.

Results

Regarding the preoperative explanation of the surgical procedures: 73% of participants reported that the procedures had been explained to them completely ($n=21$), 10% were given very little or no information ($n=3$), and 17% were given partial information ($n=5$) about the surgical steps and complications. This item has multiple strong correlations with 'trust in the surgical team', 'acknowledgement of postoperative problems', 'ready for surgery', 'difficulty in getting used to postoperative appearance', 'satisfaction

with healing', 'satisfaction with surgical results', 'improvement in postoperative appearance', 'improvement in self-confidence', and 'becoming more beautiful'. It has negative correlation with 're-operation', 'recommending surgery to other patients', 'anxiety/distress' and 'satisfaction with postoperative body image'.

Regarding psychological preparation for surgery: 83% of the participants said they were ready ($n = 25$); 13% were not ready ($n = 4$); and 3% were ready to some extent ($n = 1$). This correlates with 'dialogue with an operated patient', 'acknowledgement of postoperative problems', 'ready for surgery' and 'difficulty in getting used to postoperative appearance'. It has negative correlations with 'recommending surgery to other patients' and 'anxiety/distress'.

Regarding dialogue with an operated patient: 66% of the candidates agreed ($n = 20$); 20% disagreed ($n = 6$); and 13% partially agreed ($n = 4$) with the operated patients. This item correlates with 'psychological preparation for surgery' and 'acknowledgement of postoperative problems'. It correlates negatively with 'recommending surgery to other patients'.

None of the participants had doubts about the experience level of the surgical team: 93% ($n = 28$) had complete faith in the surgical team and 7% trusted the surgical team ($n = 2$). This item correlates with 'explanation of operative procedures', 'acknowledgement of postoperative problems', 'difficulty in getting used to postoperative appearance', 'satisfaction with healing', 'satisfaction with surgical result', 'becoming more beautiful', 'improvement in self-confidence', 'satisfaction with postoperative body image' and 'improvement in postoperative appearance'. It correlates negatively with 're-operation' and 'anxiety/distress'.

Regarding acknowledgement of postoperative problems: 50% were complete ($n = 15$), 17% were enough ($n = 5$), 17% were partial ($n = 5$), 7% were very little ($n = 29$) and 3% were not acknowledged ($n = 10$). It has no correlation with 'age', 'family support', 'satisfaction postoperative body image', 'improvement in self-confidence', 'becoming more beautiful' and 'improvement in social life'. It correlates negatively with 're-operation' and 'recommending surgery to other patients'.

Regarding family support: 80% of patients ($n = 24$) reported moral support from their families, but 2 families displayed negative attitudes to surgical interventions. This item correlates only with 'improvement in postoperative appearance'.

A total of 90% were ready for surgery ($n = 27$) and 10% were not ($n = 3$). This item correlates with 'explanation of operative procedures', 'psychological preparation for surgery' and 'acknowledgement of postoperative problems'. It correlates negatively with 'recommending surgery to other patients' and 'anxiety/distress'.

A total of 23% of patients had difficulty getting used to their postoperative appearance ($n = 7$), 7% had partial difficulty ($n = 2$), and 70% got used to their new profiles easily ($n = 21$). This item has correlations with 'explanation of operative procedures', 'psychological preparation for surgery', 'trust in surgical team', 'acknowledgement of postoperative problems' and 'improvement in postoperative appearance'. It has negative correlations with 'anxiety/distress' and 'satisfaction with postoperative body image'.

In all, 20% would not consider any re-operation ($n = 6$), 17% were ambivalent ($n = 5$), and 63% would consider re-operation ($n = 19$). It has multiple negative correlations with 'explanation of operative procedures', 'trust in surgical team', 'acknowledgement of postoperative problems', 'satisfaction with healing', 'satisfaction with surgical result', 'improvement in postoperative appearance', 'improvement in self-confidence' and 'becoming more beautiful'. It correlates positively with 'recommending surgery to other patients' and 'anxiety/distress'.

Regarding recommending surgery to other patients: 70% considered advising surgery ($n = 21$), 13% were ambivalent ($n = 4$) and 13% rejected recommendation ($n = 4$). It correlates negatively with the items 'explanation of operative procedures', 'psychological preparation for surgery', 'dialogue with an operated patient', 'acknowledgement of postoperative problems', 'ready for surgery', 'satisfaction with healing' and 'improvement in self-confidence'. This item also correlates positively with the items 're-operation' and 'anxiety/distress'.

In total, 776% of patients were very satisfied with the surgical result ($n = 23$), 17% were satisfied ($n = 5$), 3% were partly satisfied ($n = 1$), and 3% were not satisfied ($n = 1$). It correlates with 'explanation of operative procedures', 'acknowledgement of postoperative problems', 'satisfaction with healing', 'improvement in postoperative appearance', 'improvement in self-confidence' and 'becoming more beautiful'. The negative correlations of this item are 're-operation', 'anxiety/distress' and 'satisfaction with postoperative body image'.

Regarding psychological distress/anxiety: 53% of participants were not distressed ($n = 16$), 23% were a little distressed ($n = 7$), 7% were ambivalent ($n = 2$) and 17% were distressed ($n = 5$). It has multiple negative correlations with 'explanation of operative procedures', 'psychological preparation for surgery', 'acknowledgement of postoperative problems', 'ready for surgery', 'difficulty in getting used to postoperative appearance', 'satisfaction with healing', 'satisfaction with surgical results', 'improvement in postoperative appearance'. This item has positive correlations with 're-operation', 'recommending surgery to others' and 'satisfaction with postoperative body image'.

Improvement of postoperative appearance: 90% of female patients expressed complete correction and improvement of postoperative image ($n = 27$); 10% said they had very little or no change ($n = 3$). This item correlates with 'explanation of operation', 'trust in surgical team', 'acknowledgement of postoperative problems', 'difficulty in getting used to postoperative appearance', 'satisfaction with healing', 'improvement in self-confidence' and 'becoming more beautiful'. It correlates negatively with 're-operation', 'anxiety/distress' and 'satisfaction with postoperative body image'.

Regarding satisfaction with postoperative body image: 90% of the patients ($n = 27$) liked their postoperative body image very much and 10% did not ($n = 3$). It correlates negatively with 'explanation of operative procedures', 'trust in surgical team', 'difficulty in getting used to postoperative appearance', 'satisfaction with surgical result', 'improvement in postoperative appearance', 'improvement in self-confidence' and 'becoming more beautiful'. This item correlates positively with 'anxiety/distress'.

Regarding improvement in self-confidence after surgery: 63% reported an absolute improvement in social adjustment ($n = 19$), 13% were partially adjusted, and 43% reported very little or no improvement ($n = 7$). This item correlates with the items 'explanation of operative procedures', 'trust in surgical team', 'satisfaction with healing', 'satisfaction with surgical result', 'improvement in postoperative appearance', 'becoming more beautiful' and 'postoperative improvement in social life'. This item also has negative correlations with 're-operation', 'recommending surgery to other patients' and 'satisfaction with postoperative body image'.

Table 1. Correlation between items in the first subscale

Items in the questionnaire	Explanation of surgical procedures	Psychological preparation for surgery	Dialogue with an operated patient	Trust in surgical team	Acknowledgement of postoperative problems	Family support	Ready for surgery	Difficulty in getting used to postoperative appearance	Satisfaction with healing
Age	-0.203	0.083	-0.212	0.092	0.021	0.004	0.132	0.242	-0.088
Explanation of surgical procedures	1	0.310	0.219	0.700(**)	0.618(**)	0.249	0.415(*)	0.509(**)	0.734(**)
Psychological preparation for surgery	0.310	1	0.409(*)	0.700(**)	0.684(**)	0.015	0.789(**)	0.422(*)	0.115
Dialogue with an operated patient	0.219	0.409(*)	1	0.248	0.475(**)	0.139	0.250	0.317	0.186
Trust in surgical team	0.700(**)	0.280	0.248	1	0.475(**)	0.356	0.359	0.410(*)	0.755(**)
Acknowledgement of postoperative problems	0.618(**)	0.684(**)	0.475(**)	0.475(**)	1	0.122	0.519(**)	0.553(**)	0.443(*)
Family support	0.249	0.015	0.139	0.356	0.122	1	0.085	0.074	0.203
Ready for surgery	0.415(*)	0.789(**)	0.250	0.359	0.519(**)	0.085	1	0.290	0.186
Difficulty in getting used to postoperative appearance	0.509(**)	0.422(*)	0.317	0.410(*)	0.553(**)	0.074	0.290	1	0.347
Satisfaction with healing	0.734(**)	0.115	0.186	0.755(**)	0.443(*)	0.203	0.186	0.347	1
Re-operation	-0.718(**)	-0.239	-0.187	-0.530(**)	-0.508(**)	-0.144	-0.225	-0.242	-0.722(**)
Recommending surgery to other patients	-0.487(**)	-0.590(**)	-0.388(*)	-0.313	-0.627(**)	-0.086	-0.483(**)	-0.335	-0.424(*)
Satisfaction with surgical result	0.691(**)	0.088	0.059	0.640(**)	0.406(*)	0.108	0.143	0.296	0.906(**)
Anxiety/Distress	-0.501(**)	-0.543(**)	-0.334	-0.491(**)	-0.605(**)	-0.155	-0.414(*)	-0.600(**)	-0.653(**)
Improvement in postoperative appearance	0.745(**)	0.193	0.139	0.864(**)	0.439(*)	0.393(*)	0.268	0.531(**)	0.838(**)
Satisfaction with postoperative body image	-0.717(**)	-0.165	-0.110	-0.793(**)	-0.302	-0.242	-0.236	-0.598(**)	-0.591(**)
Improvement in self-confidence	0.516(**)	0.176	0.081	0.503(**)	0.172	0.158	0.353	0.177	0.533(**)
Became more beautiful	0.693(**)	0.144	0.140	0.494(**)	0.223	0.098	0.303	0.281	0.519(**)
Improvement in social life	0.080	0.015	0.013	-0.078	-0.101	-0.333	-0.104	0.113	0.035

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed)

Improvement in the concept of beauty (becoming more beautiful): 60% of females reported becoming more beautiful (n = 18), 17% reported limited improvement (n = 5) and 23% stated no change (n = 7). This item correlates with ‘explanation of operative procedures’, ‘trust in surgical team’, ‘satisfaction with healing’, ‘satisfaction with surgical result’, ‘improvement in postoperative appearance’, ‘improvement in self-confidence’ and ‘improvement in social adjustment’.

There was 40% improvement in social adjustment after surgery (n = 12), 17% partial improvement, 10% very little and 33% no improvement. The latter correlates with the ‘improvement in self-confidence’ and ‘becoming more beautiful’.

One of the surprising results was no correlation between age and the remaining items of the survey.

Discussion

Patients undergoing surgery for dentofacial deformity are mostly satisfied with the surgical results^{15,16}. Presurgical psychological distress has a negative impact on surgical outcome⁸. Dissatisfaction after surgery was significantly related to occurrence of ‘postoperative surprises’¹⁸. The factors associated with unexpected post-surgical events are inadequate explanation of surgery, emotional unpreparedness, great expectations, poor support system, and inadequate stress-coping mechanisms^{4,16,18,19}.

The postoperative adaptation of patients to changes in facial form and oral functioning takes much longer than expected. This period appears to have a dynamic relationship with interpersonal factors, such as the individual’s relationships with family, friends and co-workers as well as their performance at work or school^{1,17}. Correction of a facial deformity may not be the major determinant for improving social life^{5,6}. Orthognathic surgery might not be beneficial for a female patient who assumed that it would solve most of her personal problems¹².

Patients who receive inadequate explanation of the surgery are prone to be emotionally unprepared and anxious. The more informed patients and families were, the easier postsurgical adjustment and the more realistic expectations from the surgical outcome were⁷. According to this survey, explanation of the treatment steps prepares female patients for surgery, strengthens their faith in the surgical team and increases their satisfaction with the surgical outcome. The preoperative explanation of surgical steps in details is of

paramount importance, because it reduces anxiety and distress and considering re-operation. If there are complications or problems in the sequence of postoperative healing (facial edema, pain, lip paresthesia), the preoperative explanation prepares the patients to overcome such unanticipated events without any distress.

Psychological preparation minimizes difficulty in getting used to the postoperative body image and surgical distress; however it does not prevent female patients from not recommending surgery to others. That is attributed to the women's fear of surgery, because they consider orthognathic operations to be 'aggressive' and 'bloody'. Many women want to speak to a patient who has undergone the same procedure prior to their surgery^{17,18,20}. In this survey, the women talked to previously operated patients, and as a consequence, they felt more ready for surgery and expressed much satisfaction with the outcome. During conversations, the operated participants quoted their experiences, which also had a contributory effect on the emotional preparation of the non-operated patients. That activity did not create any negative impression on the patients since it did not cause any distress or anxiety (Table 1).

The females prepared psychologically were more likely to undergo a jaw operation. This underlines the importance of the psychological preparation of candidates for surgery, which reduces the healing period and causes less emotional distress if there are unforeseen problems (Table 1). Psychological distress and anxiety were decreased to the some level by explanation of the surgical steps, psychological support and faith in the surgical team. Post-operative distress disappeared gradually during the onset of successful scores (Table 1). Distress and anxiety scores were independent of age.

The influence of age on the females was not statistically significant regarding the probability of satisfaction from the surgical outcome (Table 2). When these findings were compared with the previous studies, it was apparent that age had an insignificant influence on the expectations and the surgical outcome among this Turkish female population. These findings completely differed from the previous studies²⁰.

Several studies report that females seek orthognathic surgery for more esthetic purposes^{7,14,18}. Turkish females have a strong perception of body image and concept of looking good in their social life. Skeletal disfigurement has a negative impact on a patient's social life, therefore

Table 2. Correlation between items in the second subscale

Items in the questionnaire	Re-operation	Recommend surgery to other patients	Satisfaction with surgical result	Anxiety/Distress	Improvement in postoperative appearance	Satisfaction with postoperative body image	Improvement in self-confidence	Became more beautiful	Improvement in social life
Age	0.210	0.125	-0.072	-0.038	0.113	0.045	-0.091	-0.296	-0.245
Explanation of operative procedures	-0.718(**)	-0.487(**)	0.691(**)	-0.501(**)	0.745(**)	-0.717(**)	0.516(**)	0.693(**)	0.080
Psychological preparation for surgery	-0.239	-0.590(**)	0.088	-0.543(**)	0.193	-0.165	0.176	0.144	0.015
Dialogue with an operated patient	-0.187	-0.388(*)	0.059	-0.334	0.139	-0.110	0.081	0.140	0.013
Trust in surgical team	-0.530(**)	-0.313	0.640(**)	-0.491(**)	0.864(**)	-0.793(**)	0.503(**)	0.494(**)	-0.078
Acknowledgement of postoperative problems	-0.508(**)	-0.627(**)	0.406(*)	-0.605(**)	0.439(*)	-0.302	0.172	0.223	-0.101
Family support	-0.144	-0.086	0.108	-0.155	0.393(*)	-0.242	0.158	0.098	-0.333
Ready for surgery	-0.225	-0.483(**)	0.143	-0.414(*)	0.268	-0.236	0.353	0.303	-0.104
Difficulty in getting used to postoperative appearance	-0.242	-0.335	0.296	-0.600(**)	0.531(**)	-0.598(**)	0.177	0.281	0.113
Satisfaction with healing	-0.722(**)	-0.424(*)	0.906(**)	-0.653(**)	0.838(**)	-0.591(**)	0.533(**)	0.519(**)	0.035
Re-operation	1	0.553(**)	-0.668(**)	0.469(**)	-0.542(**)	0.348	-0.432(*)	-0.488(**)	-0.138
Recommending surgery to other patients	0.553(**)	1	-0.271	0.596(**)	-0.291	0.175	-0.410(*)	-0.295	-0.116
Satisfaction with surgical result	-0.668(**)	-0.271	1	-0.550(**)	0.779(**)	-0.513(**)	0.525(**)	0.528(**)	0.133
Anxiety/Distress	0.469(**)	0.596(**)	-0.550(**)	1	-0.623(**)	0.374(*)	-0.331	-0.258	-0.056
Improvement in postoperative appearance	-0.542(**)	-0.291	0.779(**)	-0.623(**)	1	-0.742(**)	0.618(**)	0.538(**)	-0.017
Satisfaction with postoperative body image	0.348	0.175	-0.513(**)	0.374(*)	-0.742(**)	1	-0.387(*)	-0.569(**)	-0.081
Improvement in self-confidence	-0.432(*)	-0.410(*)	0.525(**)	-0.331	0.618(**)	-0.387(*)	1	0.715(**)	0.435(*)
Became more beautiful	-0.488(**)	-0.295	0.528(**)	-0.258	0.538(**)	-0.569(**)	0.715(**)	1	0.601(**)
Improvement in social life after surgery	-0.138	-0.116	0.133	-0.056	-0.017	-0.081	0.435(*)	0.601(**)	1

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

it seems reasonable to offer orthognathic surgery to women with dentofacial deformity to improve their psychological level and quality of life.

Almost all the expectations of the patients were met by the surgical corrections. The female patients adapted better to the physical and psychological changes than was expected. Patients reported high levels of satisfaction and improvement in self-image and overall body image after surgery. Improvement in self-image reflects improvement in body image, self-confidence and interpersonal relationships. The results from the questionnaire indicated that the obvious improvement in psychological status, body image and facial profile caused remarkable satisfaction with surgical outcome through enhancing social adjustment, self-confidence and social life.

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