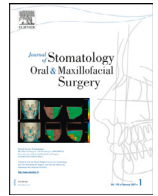




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## Original Article

## Comparison of psychosocial and aesthetic features of class III malocclusion after orthognathic surgery: Conventional approach versus surgery-first approach

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## ABSTRACT

The aim of this study is to investigate and compare the changes in psychosocial status, self-esteem, and quality of life in patients treated with conventional and SF approaches. 14 patients (mean age 23.04±3.36; 9 male and 5 female) who met the inclusion criteria were included in the SF group; 18 patients with class III malocclusion (mean age 29.27±3.78; 9 male and 9 female) were included in the COS group. In the research protocol, the first questionnaires were carried out 2 weeks before surgery (T0); second survey approximately 4 weeks after surgery (T1); and the third one was done to patients after the treatment was completed (debonding) (T2). In our study, Orthognathic Quality of Life Questionnaire (OQLQ), Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ), Oral Health Impact Profile (OHIP-14), Beck Depression Inventory second edition (BDI-II) and Rosenberg Self-Esteem Scale (RSES), surveys were conducted. No statistically significant difference was observed in all of the PIDAQ parameters and most of the OQLQ parameters within the COS and SF groups ( $P>0.05$ ). When the BDI-II results were examined, different trends in scores were observed between the two groups, and this difference was found to be statistically significant ( $P<0.05$ ). In the SF approach, progressive improvement was detected in the patients in terms of psychosocial and quality of life in the early period of treatment. The greater improvement in psychological and social characteristics in the SF approach compared to conventional orthognathic surgery may also be associated with a shorter treatment time.

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## Introduction

Orthognathic surgery provides improvements in masticatory, phonetic and respiratory functions as well as facial aesthetics. These treatments aim not only to improve the occlusion of the patients, but also to improve the patient's self-confidence, aesthetics and quality of life; Therefore, the change in the patient's facial and profile appearance after surgery and orthodontics may affect the psychological status of the patients as well as their personal and social lives[1–9]. However, the conventional approach has many disadvantages, including pre- and postoperative orthodontic treatment, such as prolonged treatment and worsening of facial profile and dental function with decompensation before surgery.

Recently, many studies have been conducted on the Surgery-First approach (SF) in the area of orthognathic surgery in the literature. It is

known that this approach has many advantages, such as the possibility of esthetic improvement from the early stage of the treatment, no pre-operative orthodontic treatment time, and shorter total treatment time [10–13]. The sudden improvement in facial aesthetics in the SF approach can also be expected to have a positive effect on patient satisfaction. However, studies on the effects of these two approaches on quality of life, psychological state, and depression are limited[14–16].

In some of the studies in the literature, only quality of life was examined, in others only self-esteem and depression were examined [17–20]. The study examining all parameters in the same study in detail is not within our knowledge. Therefore, the aim of this study is to investigate and compare the changes in psychosocial status, self-esteem, and quality of life between pre- and postoperative stages in patients treated with conventional and SF approaches.

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## Material and methods

Study design and ethical considerations were approved by the Ethical Committee of Suleyman Demirel University, Faculty of Medicine, Turkey and an informed consent was signed by all patients.

### Eligibility criteria

To be eligible for the study, adult participants had to be diagnosed as having a skeletal Class III malocclusion with a negative overjet, a maxillary deficiency and / or mandibular prognathism and a concave profile, and negative ANB angle identified in the cephalometric analysis. Double jaw surgery was performed to the all patients.

Individuals with problems other than Class III malocclusion, individuals with TMJ problems, previous orthodontic treatment, cleft lip-palate with dentofacial deformities, or obstructive sleep apnea syndrome, and patients who did not want to participate in the study were excluded from the study.

The sample size was calculated to allow a detectable difference of 4 points (Standard Deviation: 2.5; Power, 90%; Significance Level, 0.05) between the two groups based on OHRQoL measurements. It was determined that the current sample size in the study was sufficient to test other questionnaires.

Individuals were divided into two groups according to the type of treatment: patients scheduled for conventional orthognathic surgery were included in Group 1, and those with surgery-first indication into the Group 2. In all group, double jaw surgery was performed. Patients who had mild or moderate dental crowding, a flat curve of Spee, no vertical asymmetries and no transversal problems when the models were mounted on the semi-adjustable articulator for orthognathic surgery planning were allocated to the SFA group, whereas the other patients were allocated to the COS group.

### Treatment protocols

Orthodontic brackets were placed in the SF group 1 day before the operation, arch wires were placed just before the operation, and then orthognathic surgery was performed. During the operation, support was obtained from 8 mini screws for intermaxillary fixation. The surgical splint was kept for 2 weeks to provide occlusal stability. Post-operative orthodontic treatment began 15 days after surgery to provide teeth leveling and alignment, decompensation and occlusion.

The treatment of the COS group was started with orthodontic treatment for tooth leveling and decompensation. Support was obtained from the crimpable hooks placed on the arch wires for intermaxillary fixation during surgery. The surgical splint was kept for 4 weeks to provide occlusal stability. Orthodontic treatment was continued postoperatively. All patients received orthodontic treatment with a 0.022 inch MBT bracket system.

### Data collection

In the research protocol, the first questionnaires were carried out 2 weeks before surgery (T0); second survey approximately 4 weeks after surgery (T1); and the third one was done to patients after the treatment was completed (debonding) (T2). The questionnaires were digitally prepared using the SurveyMonkey program (<https://tr.surveymonkey.com/>) and sent to patients via e-mail or message.

In our study, Orthognathic Quality of Life Questionnaire (OQLQ), Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ), Oral Health Impact Profile (OHIP-14), Beck Depression Inventory second edition (BDI-II) and Rosenberg Self-Esteem Scale (RSES), surveys were conducted. Since the individuals included in our study are from the Turkish population, all questionnaires were translated into Turkish and the reliability and validity pre-tested versions were applied to the patients.

All tests and questionnaires were administered at T0, T1 and T2. Those who completed all tests and question-forms in all three stages were included in the study. The research protocol was explained to the patients and written informed consent was obtained before participating in the study.

### Instruments and measures

#### Oral health impact profile (OHIP-14)

Oral Health Impact Profile (OHIP) is a scale created to provide a more comprehensive approach to situations such as dysfunction, discomfort and incompetence reported by individuals regarding their oral conditions. It has been widely used in measuring oral health-related quality of life. It is a disease-specific measure in evaluating people's perception of the social effects of oral health disorders. The results are evaluated with 0 to 4 Likert scale. It is divided into seven main groups as, functional limitation, physical pain, psychosocial discomfort physical disability, psychosocial disability, social disability, and handicap. High values reflect the physical and mental illness of the patients, and low scores reflect that they are in good condition.

#### Orthognathic quality of life questionnaire - OQLQ

Orthognathic Quality of Life Questionnaire (OQLQ) has been developed to evaluate the facial and general appearance of patients undergoing orthognathic surgery. OQLQ consists of 22 items with a 4-point rating. 1 point means "it bothers you a little" while 4 points means "it bothers you a lot". 2 and 3 points are positioned between these two when discomfort is felt. Twenty-two items are divided into issues or areas related to the social relationships of deformity (first component), facial aesthetics (second component), oral function (third component), and awareness of dentofacial deformity (fourth component). The score range in the total OQLQ scoring ranges from 0–88. High score means low quality of life, low score means high quality of life

#### Psychosocial impact of dental aesthetics questionnaire - PIDAQ

Klages et al. based on the OQLQ questionnaire, they developed a scale specific to the field of orthodontics called the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) at the University of Mainz in 2006. The PIDAQ questionnaire consists of 23 items divided into 4 subscales that correspond to the assessed dimensions: 1) dental self-consciousness, 2) social impact, 3) esthetic attitude, and 4) psychosocial impact uses the 5-point Likert scale.

#### Rosenberg self-esteem scale (RSES)

RSES is used as the primary outcome measure for self-confidence. This widely used questionnaire is a 10-item self-report measure to assess global self-esteem by asking participants to reflect on their current emotions on an a 4-point scale (0, "strongly disagree"; 4, "strongly agree"). Total scores range from 0 to 40, with higher scores indicating higher global self-esteem. (30–40: good level of self-esteem; 26–29: self-esteem needs some improvement; 25–: low self-esteem).

#### Beck depression inventory (BDE-II)

BDI-II is widely used among adults and adolescents to measure depressive symptoms and has a long history in depression research. It consists of 21 items corresponding to 21 different symptoms. The 4-answer statements are presented in increasing order of severity and are scored from 0 to 3. The responses are summed up and scores from 0 to 63 are obtained, and higher scores indicate greater depressive symptoms. (0–9: Minimal depression; 10–16: Mild depression; 17–29: Moderate depression; 30–63: Severe depression)

### Statistical analysis

Comparison of chronological age, duration of treatment and cephalometric measurements of the individuals in the groups were compared with an independent *t*-test. Pearson's chi-square test was used for the distribution of the gender distribution of the groups and the components of malocclusions. The changes between the two groups of the study population according to the responses in T0, T1 and T2 were evaluated using the paired-samples test.

The differences were considered significant at  $P < 0.05$ . All analyses were carried out using SPSS package program (SPSS for Win, ver 20.0; SPSS Inc, Chicago, IL, USA).

### Results

The demographic and clinical characteristics of the groups are presented in Table 1. 14 patients (mean age  $23.04 \pm 3.36$ ; 9 male and 5 female) who met the inclusion criteria were included in the SF group; 18 patients (mean age  $29.27 \pm 3.78$ ; 9 male and 9 female) were included in the COS group. Combined skeletal Class III malocclusion was the most common in patients in the SF group, while maxillary retrognathia patients were the most common in the COS group. When the groups were compared statistically, it was seen that they had a similar distribution in terms of gender, age and malocclusion components ( $P > 0.05$ ). This shows that the groups are well matched.

During the treatment periods, it was observed that the treatment in the COS group was statistically significant approximately 3 times longer ( $P < 0.05$ ). In terms of skeletal features, there was no significant difference between the groups in the treatment initial values of the patients ( $P > 0.05$ ).

No statistically significant difference was observed in all of the PIDAQ parameters and most of the OQLQ parameters within the COS and SF groups ( $P > 0.05$ ). However, when the groups were compared, there was a significant difference in OQLQ scores between pre- and post-treatment, and between post-surgery and post-treatment ( $P < 0.05$ ).

When the BDI-II results were examined, different trends in scores were observed between the two groups, and this difference was found to be statistically significant ( $P < 0.05$ ). In RSES scores, although there were significant changes within the groups at different stages

of treatment ( $P < 0.05$ ), no significant difference was found between the groups ( $P > 0.05$ ).

A statistically significant difference was found in the total OHIP-14 results between the two groups in the study ( $P < 0.05$ ). Significant differences were observed in the OHIP-14 scores in parameters other than functional limitation. According to the OHIP-14 results, they reported a large deterioration in oral health up to T1 level in patients in the COS group and showed a significant improvement at the end of treatment (T2). In the SF group, there was a significant level of pre-operative discomfort at T0, while progressive improvement was observed as treatment progressed ( $P < 0.05$ ).

### Discussion

Although the indications of the surgery-first approach are more limited than conventional orthognathic surgeries, it has distinct advantages over conventional applications in patients with appropriate indications. In the surgery-first approach, the patient's surgery at the beginning of the treatment and the sudden change in profile and facial appearance accordingly enable the patients to get better psychosocially at the beginning of the treatment [10–13]. In our study, psychosocial aspects of patients who underwent conventional surgery were compared with surgery-first. The aim of this study is to examine the changes in psychosocial, esthetic, depression and self-esteem of patients with two different orthognathic surgery protocols from the preoperative period to the postoperative 6th month.

However, this study brings new perspectives to the evolution of orthognathic surgery patients in terms of both psychosocial and esthetic aspects. There are studies in the literature that mostly evaluate the quality of life of orthognathic surgery patients, and there are very limited studies evaluating their psychological conditions in the same study. To the best of our knowledge, this study seems to be the first study to compare a conventional orthognathic surgery cohort with the surgery-first orthognathic surgery group in terms of both psychological characteristics, social aspects, quality of life, depression and self-esteem.

The timing of data collection has an impact on outcomes when examining changes in patients' psychosocial status. Most researchers recommend that surveys and indexes be applied on the pre-operative orthodontic preparation day and an average of

**Table 1**  
Demographic and clinical characteristics of the groups.

	Conventional Ortognathic Surgery Group (COS)	Surgery-First Group (SF)	P
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	
AGE *	23.04 ± 3.36	29.27 ± 3.78	NS
(years)			
GENDER †	9 (%50)	9 (%35.71)	NS
(n;%)	9 (%50)	5 (%64.29)	
Male			
Female			
TREATMENT TIME *	1.67 ± 0.47	0.58 ± 0.26	***
(years)			
SKELETAL FEATURES †	8 Maxillary Retrognathia	7 Maxillary Retrognathia	NS
Type of	1 Mandibular Prognathia	3 Mandibular Prognathia	
Class III Malocclusion	9 Combined	4 Combined	
CEPHALOMETRIC MEASUREMENTS *	SNA (°)	78.54 ± 3.06	NS
	SNB (°)	83.36 ± 4.17	NS
	ANB (°)	-4.82 ± 3.61	NS
	SN-Go/Gn (°)	37.08 ± 5.28	NS
	Overjet (mm)	-3.46 ± 3.09	NS
	Overbite (mm)	-0.46 ± 2.05	NS

$\bar{x}$ : mean; SD: Standard Deviation.

† Pearson chi-square test.

\* Independent *t*-test; NS: Not significant  $P > 0.05$ .

\*\*\*  $P < 0.001$ .

**Table 2**  
Comparison of pre-surgery, post-surgery and post-treatment values in groups.

	Pre-Surgery (T0)			Post-Surgery (T1)			Post-Treatment (T2)		
	COS $\bar{x} \pm SD$	SFA $\bar{x} \pm SD$	P	COS $\bar{x} \pm SD$	SFA $\bar{x} \pm SD$	P	COS $\bar{x} \pm SD$	SFA $\bar{x} \pm SD$	P
OQLQ (Total Score) - [0–88]	61.44 ± 12.75	66.24 ± 14.23	NS	32.56 ± 6.53	37.72 ± 6.02	*	16.63 ± 6.12	15.49 ± 7.23	NS
Social Relationship - [0–32]	20.6 ± 6.12	22.65 ± 6.31	NS	9.28 ± 3.48	12.46 ± 3.96	*	5.1 ± 2.32	4.76 ± 1.17	NS
Facial Aesthetic - [0–20]	16.25 ± 4.24	17.96 ± 4.72	NS	7.43 ± 4.67	8.33 ± 4.93	NS	3.67 ± 4.66	3.27 ± 3.85	NS
Oral Function - [0–20]	11.75 ± 4.72	12.13 ± 4.29	NS	6.21 ± 2.84	7.47 ± 3.56	NS	3.06 ± 2.48	2.48 ± 0.77	NS
Awareness of Dentofacial Deformity - [0–16]	12.84 ± 2.63	13.5 ± 2.37	NS	9.64 ± 3.23	9.46 ± 3.64	NS	4.8 ± 3.04	4.98 ± 3.41	NS
PIDAQ (Total Score) - [0–92]	48.79 ± 6.77	49.3 ± 6.81	NS	37.15 ± 4.68	37.28 ± 4.79	NS	27.29 ± 5.37	27.06 ± 5.66	NS
Dental Self-Consciousness - [0–24]	14.51 ± 5.01	14.54 ± 4.72	NS	11.71 ± 5.71	11.73 ± 5.81	NS	8.47 ± 3.81	8.29 ± 3.62	NS
Social Impact - [0–32]	10.63 ± 6.41	10.88 ± 5.89	NS	7.26 ± 3.63	7.49 ± 3.51	NS	5.21 ± 2.73	5.14 ± 2.81	NS
Esthetic Attitude - [0–12]	10.41 ± 5.82	10.54 ± 5.69	NS	8.73 ± 4.74	8.69 ± 4.91	NS	6.55 ± 3.49	6.57 ± 3.41	NS
Psychological Impact - [0–24]	13.24 ± 6.18	13.34 ± 5.95	NS	9.31 ± 4.64	9.36 ± 4.93	NS	7.08 ± 3.46	7.07 ± 3.81	NS
OHIP – 14 (Total Score) - [0–56]	9.74 ± 1.64	16.08 ± 2.96	***	12.88 ± 3.91	10.5 ± 2.56	*	4.89 ± 0.38	6.68 ± 1.06	*
Functional Limitation - [0–8]	1.41 ± 2.3	1.44 ± 1.54	NS	1.68 ± 1.59	1.75 ± 1.51	NS	0.67 ± 0.31	0.61 ± 1.17	NS
Physical Pain - [0–8]	2.27 ± 1.9	2.84 ± 2.32	NS	2.4 ± 2.45	2.5 ± 1.92	NS	1.27 ± 0.49	1.02 ± 1.33	NS
Psychosocial Discomfort - [0–8]	1.50 ± 1.29	3.23 ± 2.39	*	2.82 ± 2.18	1.57 ± 1.16	NS	0.56 ± 0.29	1.17 ± 0.84	*
Physical Disability - [0–8]	0.50 ± 1.01	1.93 ± 2.30	*	0.78 ± 0.98	0.55 ± 0.49	NS	0.41 ± 0.31	0.35 ± 0.19	NS
Psychosocial Disability - [0–8]	2.25 ± 2.63	2.73 ± 1.95	NS	2.49 ± 2.53	2.22 ± 2.84	NS	1.05 ± 0.63	1.93 ± 1.87	*
Social Disability - [0–8]	1.33 ± 1.88	2.36 ± 1.69	*	1.50 ± 2.38	1.13 ± 1.76	NS	0.72 ± 0.18	0.76 ± 0.97	NS
Handicap - [0–8]	0.48 ± 0.51	1.55 ± 1.57	*	0.61 ± 1.20	0.78 ± 1.26	NS	0.21 ± 0.41	0.64 ± 1.03	**
BDI – II (Total Score) - [0–63]									
Beck Depression Inventory	12.45 ± 1.36	13.05 ± 2.07	NS	11.9 ± 0.71	11.27 ± 3.06	NS	11.27 ± 0.78	10.66 ± 1.74	*
RSES (Total Score) - [0–40]									
Rosemberg Self-Esteem Scale	21.44 ± 2.22	23.91 ± 2.58	*	27.94 ± 1.69	29.54 ± 1.75	*	28.38 ± 1.14	30.18 ± 1.53	*

COS: Conventional Orthognathic Surgery; SFA: Surgery-First Approach; P, results of student *t*-test;  $\bar{x}$ :Mean; SD:Standard Deviation.

NS Not significant  $P > 0.05$ .

\*  $P < 0.05$ .

\*\*  $P < 0.01$ .

\*\*\*  $P < 0.001$ .

6 months after the surgical procedure. In the 6-month postoperative period, edema decreases, esthetic facial and oral function changes can be seen more clearly, and the patient can return to social interaction[1–4].

In our study, we chose to do an evaluation in the 1st month postoperatively, the reason for this is that the quality of life, self-esteem or depression are affected by pain, edema and intermaxillary elastic, etc., immediately after surgery. It is because we want to confirm that it is getting worse because of the circumstances.

Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) was developed based on the Orthognathic Quality of Life Questionnaire (OQLQ), which was developed by Klages to evaluate the facial and general appearance of patients undergoing orthognathic surgery [21]. Although there are differences between the scoring of OQLQ and PIDAQ questionnaires, they are almost similar in terms of subgroups. In our study, in most of the results of both OQLQ and PIDAQ questionnaires, no significant difference was found between both groups.

While Huang et al. found the quality of life scores similar between the two groups, they found a more satisfactory quality of life in the SF approach compared to the conventional approach[18]. A meta-analysis study from 2019 also revealed a more significant improvement in the SF approach in quality of life scores[22]. Saghafi et al. also reported a more significant improvement in the SF approach, while the most significant improvement was in the facial esthetic and social aspects[19]. In our study, a significantly higher increase was found in the OQLQ results in the pre- and post-surgery results in the social relationship, facial esthetic, oral function and total score in the SF approach.

When the results of OHIP-14 were examined, a significant difference was observed between the two groups in the oral health impact profile in parameters other than functional limitation. In the results

of the OHIP-14 questionnaire, a postoperative decrease was detected with an increase from the pre-treatment to the preoperative period due to the worsening in the pre-surgery profile in the conventional group; there is a trend towards progressive improvement in the SF approach. The OHIP-14 results highlight the significant difference, with a large improvement in discomfort in SF approach compared to conventional approach. In fact, despite the pain and edema, it seems at surgery first patients immediately notice improvement in their condition after surgery. However, after a few months of orthodontic treatment, patients will again perceive their oral health and psychological well-being[17,18,23].

There are quite a limited number of those evaluating the level of depression in studies on the SF approach. It was observed that the patients included in our study had a similarly slightly depressive ( $10^+$ – $16^-$ ) condition in both groups. Compared to the conventional approach, in the SF approach, a significant decrease was observed in the level of depression between the end of treatment and the beginning of treatment. Although Brucoli et al. obtained similar results in their studies, it was not statistically significant. The reason for this may be the evaluation time, the initial depression level of the patients. Our study revealed that the advantages of the SF approach between the pre- and post-treatment are also effective at the level of patient depression.

There was no significant difference between conventional approach and SF approach according to RSA. While self-esteem was found to be low in individuals in both groups at the beginning of the treatment ( $25^-$ ), significant improvement was observed in both groups after the treatment, but not at a significant level. Although there are very few studies in the literature that can be compared, our findings were consistent with Brucoli et al.'s study[17].

In generally, when the results of the study are examined, it is seen that both treatment protocols are successful in contributing

**Table 3**  
Mean values and statistical comparison of changes in groups.

		$\Delta T0-T1$	<i>p</i>	$\Delta T1-T2$	<i>p</i>	$\Delta T0-T2$	<i>p</i>
OQLQ (Total Score) - [0–88]	COS	-28.98	NS	-16.39	**	-44.81	**
	SFA	-28.52		-22.23		-50.75	
Social Relationship - [0–32]	COS	-11.32	NS	-4.18	**	-15.49	*
	SFA	-10.19		-7.69		-17.89	
Facial Aesthetic - [0–20]	COS	-8.82	NS	-3.76	*	-12.58	*
	SFA	-9.63		-5.06		-14.69	
Oral Function - [0–20]	COS	-5.75	NS	-3.15	*	-8.69	NS
	SFA	-4.66		-4.99		-9.65	
Awareness of Dentofacial Deformity - [0–16]	COS	-3.19	NS	-4.84	NS	-8.04	NS
	SFA	-3.86		-4.48		-8.52	
PIDAQ (Total Score) - [0–92]	COS	-11.64	NS	-9.86	NS	-21.49	NS
	SFA	-12.02		-10.22		-22.24	
Dental Self-Consciousness - [0–24]	COS	-2.79	NS	-3.24	NS	-6.04	NS
	SFA	-2.81		-3.44		-6.25	
Social Impact - [0–32]	COS	-3.37	NS	-2.05	NS	-5.42	NS
	SFA	-3.39		-2.35		-5.74	
Esthetic Attitude - [0–12]	COS	-1.68	NS	-2.18	NS	-3.86	NS
	SFA	-1.85		-2.12		-3.97	
Psychological Impact - [0–24]	COS	-3.93	NS	-2.23	NS	-6.16	NS
	SFA	-3.98		-2.29		-6.27	
OHIP – 14 (Total Score) - [0–56]	COS	+3.14	***	-7.99	***	+4.86	***
	SFA	-5.58		-3.82		+9.39	
Functional Limitation - [0–8]	COS	+0.27	NS	-1.01	NS	-0.74	NS
	SFA	+0.31		-1.14		-0.83	
Physical Pain - [0–8]	COS	+0.13	**	-1.13	NS	-0.99	**
	SFA	-0.34		-1.48		-1.82	
Psychosocial Discomfort - [0–8]	COS	+1.32	***	-2.26	**	-0.94	**
	SFA	-1.66		-0.39		-2.06	
Physical Disability - [0–8]	COS	+0.28	**	-0.37	*	-0.09	**
	SFA	-1.38		-0.19		-1.58	
Psychosocial Disability - [0–8]	COS	+0.24	**	-1.44	**	-1.19	*
	SFA	-0.51		-0.29		-0.79	
Social Disability - [0–8]	COS	+0.17	***	-0.78	**	-0.61	**
	SFA	-1.23		-0.37		-1.59	
Handicap - [0–8]	COS	+0.13	***	-0.39	*	-0.27	**
	SFA	-0.77		-0.14		-0.91	
BDI – II (Total Score) - [0–63] Beck Depression Inventory	COS	-0.55	**	-0.63	NS	-1.18	**
	SFA	-1.78		-0.61		-2.39	
RSES (Total Score) - [0–40] Rosemberg Self-Esteem Scale	COS	+6.49	NS	+0.44	NS	+6.94	NS
	SFA	+5.63		+0.64		+6.27	

COS: Conventional Orthognathic Surgery; SFA: Surgery-First Approach;.

P, results of independent *t*-test;.

NS: Not significant *P*>0.05.

\* *P*<0.05;.

\*\* *P*<0.01.

\*\*\* *P*<0.001.

positively to the psychosocial state of the patient. The low number of patients in the study population and the lack of a long-term (1 or 2 years) follow-up for further application of the questionnaires can be considered as the limitation of this study. In addition to common indications for all patients in both protocols, the fact that both protocols cannot be applied depending on clinical reasons in some cases may create a bias for the study in terms of the distribution of patients to groups. This situation can be considered as a limitation for our study.

In conclusion, it was seen that both orthognathic surgery approaches positively affect the patients in terms of psychosocial and quality of life due to their contribution to the face and profile appearance. In the SF approach, progressive improvement was detected in the patients in terms of psychosocial and quality of life with the correction of the patient's primary complaint, the non-esthetic face and profile appearance, in the early period of treatment. The greater improvement in psychological and social characteristics in the SF approach compared to conventional orthognathic surgery may also be associated with a shorter treatment time. While both orthognathic

surgical approaches did not significantly affect self-esteem, a greater reduction in depression level was observed in the SF approach. [Table 2](#) and [3](#)

## Discussion

There is no competing interest.

## References

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