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Quality of life assessment in orthognathic surgery patients with dentofacial deformity

Suha N. Aloosi [1], Zanyar M. Amin [1], Hawbash O. Muhamed [2*]

1. Department of Oral and Maxillofacial Surgery, School of Medicine, Faculty of Dentistry, University of Sulaimani, Kurdistan Region, Iraq.

2. Department of Oral and Maxillofacial Surgery, Sulaimany Teaching Hospital, Sulaimany, Kurdistan Region, Iraq.

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**Corresponding author:*
Hawbash O. Muhamed

Department of Oral and Maxillofacial Surgery, Sulaimany Teaching Hospital, Francois Mitterrand Street, Sulaymaniyah, Kurdistan Region, Iraq.

Tel: +964-77-1564731
Fax: +98-21-42792662
Email: shakhawandr@Hotmail.com

ABSTRACT

Objective: Quality of life assessment of Kurdish patients with dentofacial deformities after orthognathic surgery to compare their results with those of patients who have no dentofacial deformity by applying the orthognathic quality of life questionnaire (OQLQ).

Materials and Methods: Three groups of patients were interviewed, and orthognathic quality of life questionnaires (OQLQ) was used to assess generic health-related quality of life. They were asked to complete the Kurdish version of the 22-item orthognathic quality of life questionnaire (OQLQ) for control, preoperatively and postoperatively patient. Responses at these different time points were compared using paired t-tests, with the significance level set to $P<0.05$.

Results: There were statistical differences in the satisfaction of four domains (oral function, facial aesthetics, psychological, and social aspects) by these indicated that quality of life was significantly improved by orthognathic surgery (all $P<0.001$). Results showed statistical differences between groups and suggested that patients with no deformity and those subjected to orthognathic surgery have a better quality of life compared to those with a facial deformity.

Conclusion: Dentofacial correction by orthognathic surgery seems to have a positive effect on the quality of life.

Keywords: Orthognathic surgery; Dentofacial deformities; Quality of life.

Introduction

Quality of life is determined by people's perception according to the World Health Organization (WHO), about their position in life by taking into account their cultural context and their value system, as well as their goals, expectations, and concerns. This concept is easy to understand and is greatly influenced by many aspects of life [1]. Modern society places great importance on physical appearance. Aesthetic and facial appearance affects a person's self-confidence and acceptance in society, which in general affect his or her quality of life [2]. Orthognathic surgery, a corrective jaw procedure, is indicated in cases of severe dentofacial deformity that cannot be corrected by orthodontic treatment alone [3]. Orthognathic surgery is used to correct dentofacial deformities to provide better maxilla-mandibular function and facial aesthetics. Many surgical techniques are available, and they are applied according to the needs of each specific case [4,5,6]. The dentofacial deformity is unequivocally connected with a psychosocial burden and societal drawback since of the way that both people and others see

the variety in facial appearance [7]. Patients are reported to underperform in school, college, or the workplace and have trouble in appearance. Orthognathic treatment is a complex procedure the decision to continue with it often involves external influences, including the views and opinions of friends, family, and healthcare professionals [8]. Whereas orthognathic surgery will create a physical alter, patients also expect nonphysical benefits, such as improvements in self-confidence or lifestyle [9]. Therefore these benefits can be measured by using assessments of patient-reported quality of life (QoL). Assessments of this type have been used throughout healthcare but can be particularly pertinent for interventions such as orthognathic surgery, in which a disease is not cured or life expectancy altered. The increasing use of QoL measures in orthognathic surgery highlights the importance of a patient-centered approach [10] and a shared–decision-making process [11]. QoL measures also give consideration to indirect effects that may occur following treatment in addition to the physical changes traditionally recorded [9]. Thus the aim of this study was to measure the impact of orthognathic surgery on patients' quality of life using a Kurdish translated version of the 22-item self-reported OQLQ.

1. Patients and Methods

2.1 Study design

To evaluate the difference in the quality of life of patients with dentofacial deformity to a normal patient, the study was started by (300) three hundred eligible patients and was enrolled in this study. (200) two hundred patients were those visited the Department of Oral Maxillofacial Surgery, Sulaymaniyah teaching Hospital seeking for facial deformity correction also (100) one hundred patients have a dental problem visited the dental center for another dental problem and divided as three groups of patients were set: group I, patients (control group) with no facial deformity; group II, patients with facial deformity before surgery (not operated); group III, patients with a facial deformity and subjected to surgery. Group I (control group) comprised 100 patients (32 males and 68 females) who had no dentofacial deformity and were diagnosed as nonsyndromic, no cleft lip and palate, and no physical facial trauma and were not subjected to any surgical procedures. Group II was composed of 100 patients (36 males and 64 females) with dentofacial deformities and diagnosed as nonsyndromic, without cleft lip and palate also must not have facial trauma or were not subjected to the surgical procedure; all patients in this group were in the orthodontic phase before orthognathic surgery. Group III comprised 100 patients (27 males and 73 females) who had dentofacial deformities and were nonsyndromic, no cleft lip and palate, and no facial trauma but was subjected to orthognathic surgery for dentofacial deformity correction (at least 6 months after surgery).

2.2 Instruments and Data Collection

By using orthognathic quality of life questionnaire (OQLQ) which consists of 22 questions are rated on a 5-point Likert scale ranging from (score 0) "does not bother me at all" 1= 'means it bothers you a little'; 2 and 3= 'lie between these statements and 4= 'means it bothers you a lot. Mean range from (Score 0)= 'means does not bother you to (score 4) "bothers me a lot".

The questions in the III group time points addressed four main areas as follows:

- Facial aesthetics: measure patient satisfaction with facial appearance and smile. Scale as an aesthetic impact (items 1, 7, 10, 11, and 14, range 0 to 20).

- Oral function: measure patient problems in mastication and speech. Scale as an oral function (2 to 6, range 0 to 20).

- Psychological impact: The effect of the dentofacial deformity on the patient's conscious awareness. Scale as awareness impact (8, 9, 12, and 13, range 0 to 16).

- Social impact: The effect of the dentofacial deformity on the patient's social life. Scale as a social impact (items 15 to 22, range 0 to 32).

The total score is 0 to 88 divided by Aesthetic (0-20) + Oral function (0-20) + Psychological (0-16) + Social (0-32). A lower score indicates a better Quality of Life and vice versa.

The questionnaire was applied by a trained researcher. The questionnaire was translated into Kurdish using a standardized forward-backward linguistic translation method. The content validity of the questionnaire was approved by psychiatric specialists. All patients in the sample; information about age and gender were also collected (Table 2) show demographic data. Also, The OQLQ was applied to all the sample data were collected using self-administered 22-item orthognathic quality of life questionnaire. The orthognathic quality of life questionnaire (OQLQ) was developed as an instrument to estimate the quality of life in patients treat-

ed with orthognathic surgery in 2000 and validated in 2002 by Cunningham et al. [12,13,14].

2.3. Data Analysis

Descriptive summary statistics were generated for the questionnaires the "IBM SPSS Statistics version 25" was used for the analysis of the data, and both descriptive and inferential statistics were used. Furthermore, a P-values of (≤0.05 and <0.001) were considered as statistically significant, and highly significant associations, respectively. Also, the Student's T-Test was used to compare numerical independent and dependent variable pairs.

2.4. Ethical considerations

The research protocol was approved in advance by the ethics committee of the Kurdistan Board for medical specialty and written informed consent was obtained from all subjects prior to the investigation.

Results

The study sample consisted of three groups to have 100 patients each. The whole sample average age was 25.5 years (S.D. 4.77) and the pretreatment patients (group II) were significantly younger than the post-surgery (group III), 24.14 years (S.D. 5.61) versus 25.32 years (S.D. 6.03), p<.001. Female was most (205/300, 68%) and also single were most (205/300, 68%). (Table III) show demographic information on the whole sample. The OQLQ questionnaire composed of 22 questions is divided into 4 main as follow social aspects (questions 15-22), facial aesthetics (1,7,10,11, and 14), oral function (2-6) and psychological aspects (8,9,12, and 13) (Table 3).

- Facial aesthetics

In this domain "facial aesthetics" the mean±SD (5.03 ±0.17) groups I and (5.96±1.41) group III this shows that the answers "It does not bother me" or "It does not apply to me" were more frequent in groups I and III. Also, mean±SD (8.88±1.92) show as the answer "It does bother me" was more frequent in group II as a result showed how the surgery had changed such dissatisfaction in those who had their deformity corrected. Thus, there was a significant statistical similarity between groups I and III in the "facial aesthetics" domain, and there was a difference between these groups and group II in the same domain (P<.001). (Figure 1) (Table 3) show patient satisfaction very near to normal patients compare to other domains.

- Oral function

In this domain "oral function" was similar to the previous domains. Groups I and III had more of the response "It does not apply to me," and group II had more responses revealing its dissatisfaction with oral function. In addition, these results highlight the fact that dentofacial deformities influence not only aesthetics but also affect mastication, speech, and other oral function. There was a significant statistical similarity between groups I and III in the "oral function" domain, and there were differences between these groups and group II in the same domain (P<.001) (Figure 1).

- Social aspects

In this domain "social aspects" Similar responses were found the mean±SD (8.01±0.10) groups I and (9.47± 2.48) group III this shows that the answers "It does not bother me" or "It does not apply to me" were more frequent in groups I and III. There was a statistical similarity between groups I and III in the "social aspects" domain. Also mean±SD (11.28±2.55) show as the answer "It does bother me" was more frequent in group II as a result group II Feel that their dentofacial deformity was a social barrier and there was a significant statistical difference between these 2 groups (I, III) and group II in the same domain (P<.001) (Figure 1) (Table 3).

- Psychological aspects

In this domain "psychological aspects" also was similar to other domain. Groups I and III showed a relative balance between all answers group II had more of the answers "It does bother me" this response revealing its dissatisfaction psychologically to facial deformity. There was a significant statistical similarity between groups I and III in the "psychological aspect" domain, and there was a difference between these groups and group II in the same domain (P<.001). (Figure 1) show patient satisfaction not very near to normal patients compare to other domains.

Total score (Figure I) revealed mean scores of each group (in the whole questionnaire) graphic line shows a similarity between groups I and III, whose mean scores were low (22 in group I and 26 in group III), patient satisfaction in normal group and postoperation group 75%, 70% respectively. Whereas individuals in group II presented higher mean scores [34] patient satisfaction in the preoperation group 61%. Therefore, we could assume that individuals who lived with the deformity and were later subjected to the orthognathic surgery experienced significant improvement if see patient sat-

isfaction change from pre to postoperation 61% to 70% in comparison with patients who did not have any deformity which is very near because of normal patient satisfaction 75%. There was a significant statistical difference in this domain among the 3 groups (group II> group III> group I) (P<.01).

Number	Question
1	I am self-conscious about the appearance of my teeth.
2	I have problems biting.
3	I have problems chewing.
4	There are some foods I avoid eating because the way my teeth meet makes it difficult.
5	I don't like eating in public places.
6	I get pains in my face or jaw.
7	I don't like seeing a side view of my face (profile).
8	I spend a lot of time studying my face in the mirror.
9	I spend a lot of time studying my teeth in the mirror.
10	I dislike having my photograph taken.
11	I dislike being seen on video.
12	I often stare at other people's teeth.
13	I often stare at other people's faces.
14	I am self-conscious about my facial appearance.
15	I try to cover my mouth when I meet people for the first time.
16	I worry about meeting people for the first time.
17	I worry that people will make hurtful comments about my appearance.
18	I lack confidence when I am out socially.
19	I do not like smiling when I meet people.
20	I sometimes get depressed about my appearance.
21	I sometimes think that people are staring at me.
22	Comments about my appearance really upset me, even when I know people are only joking.

Table 1. Orthognathic quality of life questionnaire. The answers for all questions were (0,1,2,3,4) 0= does not bother me at all. 1= It bothers you a little; 2_3= Lie between these statements; and 4= It bothers you a lot.

	Data/Groups	Group I (n=100)	Group II (n=100)	Group III (n=100)
	Age	26.76±6.73	24.14±5.61	25.32±6.03
Gender	Male	32 (32%)	36 (36%)	27 (27%)
	Famale	68 (68%)	64 (64%)	73 (73%)
Marital status	Single	59 (59%)	69 (69%)	77 (77%)
	Married	41 (41%)	31 (31%)	23 (23%)

Table 2. Demographic data.

Variables	Normal control		Preoperative		Postoperative		P-value*
	Mean±SD	Range	Mean±SD	Range	Mean±SD	Range	
Facial aesthetics (1,7,10, 11, and 14)	5.03 ± 0.17	5 to 6	8.88±1.92	5 to 14	5.96±1.41	5 to 12	<0.001
Oral function (2-6)	5.02 ±0.14	5 to 6	6.77±1.67	5 to 12	5.73±1.51	5 to 13	<0.001
Psychological aspect (8, 9,12, and 13)	4.05±0.22	4 to 5	7.09±1.61	4 to 11	5.77±1.76	4 to 11	<0.001
Social aspect (15-22)	8.01±0.1	8 to 9	11.28±2.55	8 to 20	9.47±2.48	8 to 23	<0.001
Total scores	22.11±0.35	22 to 24	34.02±5.01	24 to 52	26.93±5.64	22 to 46	<0.001
Satisfaction % in total scores	75%		61%		70%		<0.001

Table 3. Comparison of mean scores of OQLQ between control and case groups.

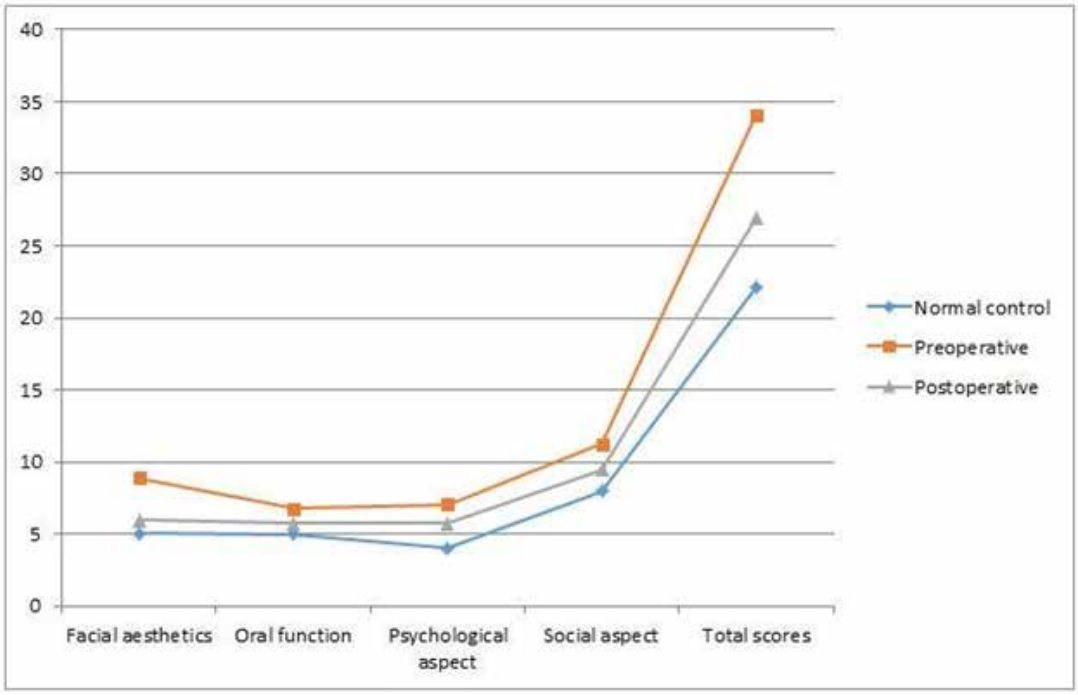

Figure 1. Shows distribution of the scores among the groups.

Discussion

In recent times, people have directed great care towards their appearance and how it can affect their careers, relationships, self-confidence, and, generally, quality of life. Health defines by the world health organization (WHO) as «a state of complete physical, mental and social wellbeing and not merely the absence of any disease or infirmity» [15]. In every person the QOL is affected by a compromise in the physical, mental and social dimensions of health. Dentofacial deformities result in a compromise in aesthetics, function as well as overall psychological status of the patients [16]. Most patients who visit a clinic for the first time with dentofacial deformities frequently behave in a shy, defensive, and passive manner due to of a lack of confidence in their appearance [17]. Facial appearance leads to impacts and influences on many aspects of life such as social interactions, chances when seeking employment, being chosen as a partner, and their personality characteristics; therefore it affects their QOL. Therefore orthognathic surgery in these patients has become more important because it has been widely performed to improve dentofacial deformities [18,19].

The initial question that this study aimed to answer was whether dentofacial deformity has some negative influence on the patient›s quality of life and whether surgical correction of this deformity could change this negative influence. Previous studies showed the growing interest in investigating the impact of facial deformities on quality of life [14]. This study in our locality

showed that there were significant improvements in patients' quality of life after orthognathic surgery compared with baseline levels. Our finding is consistent with similar studies conducted in China and the USA using the same questionnaire [20,21]. Furthermore, this finding is supported by many other studies that show remarkable improvements in patients' wellbeing in different aspects including psychological, functional, social and emotional [13,22,23,24,25–28]. These findings illustrate the effectiveness of orthognathic surgery beyond its surgical complications like swelling, bleeding, and pain.

In terms of different aspects of patients› QOL, maximum changes occurred in the esthetic, functional domain and then social and psychological aspects, respectively. These results are similar to previous studies [20,22,29]. According to Cunningham et al. [13] quality of life, as a concept explored in clinical research, is related to patients health, making this concept a multidimensional one. The same author assessed the quality of life in another study [12] and found a significant correlation between the «social aspects» and «aesthetics» domains after orthognathic surgery, thus corroborating the findings of the present study.

Ribeiro-Neto et al. [14] made a comparative study on the three groups OQLQ and stated that significant changes were observed in the aesthetic, psychological, social and function domains, also corroborating the findings of the present study. Lee et al. [24] evaluated the quality of life through three different instruments and showed statistical differences in all 4 domains through the application of the OQLQ. They [6, 30] also reported improvement in the quality of life after surgery, even in the early stages, after applying the condition-specific questionnaire (OQLQ). According to those authors, the orthognathic surgery corrects the dentofacial deformity, and the questionnaire (OQLQ) addresses specific issues. They conclude that the OQLQ is highly capable of identifying changes in the quality of life of treated patients. With regard to the present study, we also addressed the importance of the outcome of every surgical intervention, which was the main reason for conducting this study. Almost all of these studies evaluated different patients in different groups (I, II, and III) based on previously described characteristics (methodology). This methodology was chosen by us the authors to include a larger number of participants and to assess the quality of life of different individuals with or without facial deformity. However, the authors showed that patients without facial deformity answered the questionnaire similar to those who had the deformity and had been treated. Most studies assessing orthognathic surgery showed improvement in the quality of life after it [30-33]. The majority of the participants were dissatisfied with their facial appearance and smile in the pre-treatment evaluation. This was more evident in females. This is understandable because females tend to be more open to express concerns and feelings regarding aesthetics and appearance. Interestingly, the females in our study population felt that their job was affected due to their dentofacial deformity. The present study shows a greater change in pre-operative and post-operative scores of facial aesthetics and functional domain which is similar to previous studies but in contrast, to study by Abdullah et al. [6] in their study, the difference in social aspect domain was greatest. They also found the changes in scores of awareness domain to be very small finding it is similar to other studies and contributed that malocclusion and their treatment had little effect on general quality of life. This is again in contrast to the present study. In the present study, we find that mean score changes in awareness domain is similar to changes in other domain of OQLQ. This could be attributed to the fact that all the patients in our study were well educated and were more conscious about their appearance.

Conclusions

The present study showed a highly significant improvement in our patients' quality of life following orthognathic surgery by improvement in all four OQLQ domains. The facial aesthetics domain was shown to be more important for patients than were social aspects and oral function. This suggests that quality of life improves in patients who have their dentofacial deformities corrected. These patients recover their self-esteem, and their oral function improves, making their lives better. Concluded that orthognathic surgery is of significant benefit to patients with a dentofacial deformity.

Conflict of Interest

There is no conflict of interest to declare.

References

[1] Soh CL, Narayanan V. Quality of life assessment in patients with dentofacial deformity undergoing orthognathic surgery—a systematicreview. Int J Oral Maxillofac Surg. 2013; 42:974-980.

[2] Marques, L.S., Ramos-Jorge, M.L., Paiva, S.M., Pordeusb, I.A., Malocclusion: esthetic impact and

quality of life among Brazilian schoolchildren. Am. J. Orthod. Dentofacial Orthop. 2006; 129, 424–427.

[3] Ong, M.A.D., Spectrum of dentofacial deformities. Ann. Acad. Med. Sing. 2004; 33, 239–242.

[4] Gava ECB, Miguel JAM, Araujo AM, Oliveira BH. Psychometric properties of the Brazilian version of the orthognathic quality of life questionnaire. J Oral Maxillofac Surg. 2013; 71:2013..8:1762.e1-1762.e8.

[5] Murphy C, Kearns G, Sleeman D, Cronin C, Allen PF. The clinical relevance of orthognathic surgery on quality of life. Int J Oral Maxillofac Surg. 2011; 40:926-930.

[6] Abdullah WA. Changes in quality of life after orthognathic surgery in Saudi patients. Saudi Dent J. 2015;27:161-164. doi:10.1016/j.sdentj.2014.12.001.

[7] Alanko OM, Svedstrom-Oristo AL, Tuomisto MT. Patients' perceptions of orthognathic treatment, well-being, and psychological or psychiatric status: a systematic review. Acta Odontol Scand. 2010; 68:249–260.

[8] Garvill J, Garvill H, Kahnberg KE, Lundgren S. Psychological factors in orthognathic surgery. J Craniomaxillofac Surg. 1992; 20:28–33.

[9] Ryan FS, Barnard M, Cunningham SJ. What are orthognathic patients' expectations of treatment outcome—a qualitative study. J Oral Maxillofac Surg. 2012;70:2648–2655.

[10] Department of Health. Department of Health Business Plan 2013–2015. Available at: http://transparency.number10.gov. uk/business-plan/3/64. Accessed January 1, 2015.

[11] Elwyn G, Frosch D, Thomson R, et al. Shared decision making: a model for clinical practice. J Gen Intern Med. 2012; 27:1361–1367.

[12]Cunningham SJ, Garrat AM, Hunt NP. Development of a condition- specific quality of life measure for patients with dentofacial deformity: II. Validity and responsiveness testing. Community Dent Oral Epidemiol. 2002; 30:81-90.

[13]Cunningham SJ, Garrat AM, Hunt NP. Development of a condition- specific quality of life measure for patients with dentofacial deformity. Community Dent Oral Epidemiol. 2000; 28:195-201.

[14] Ribeiro-Neto CA, Ferreira G, Monnazzi GCB, Gabrielli MFR, Monnazzi MS. Dentofacial deformities and the quality of life of patients with these conditions: a comparative study. Oral Surg Oral Med Oral Pathol Oral Radiol. 2018; 126(6):457–462. doi:10.1016/j.oooo.2018.08.013.

[15] Agrawal Ronika CD. Assessment of quality of life in normal individuals using the SF-36 questionnaire. Int J Cur Res Rev 2017; 9 (February (3)).

[16]Takatsuji H, Kobayashi T, Kojima T, Hasebe D, Izumi N, Saito I, et al. Effects of orthognathic surgery on psychological status of patients with jaw deformities. Int J Oral Maxillofac Surg 2015; 44 (September (9)):1125–30.

[17]Almeida AB, Leite IC, Melgaço CA, Marques LS. Dissatisfaction with dentofacial appearance and the normative need for orthodontic treatment: determinant factors. Dental Press J Orthod. 2014;19(3):120–126. doi:10.1590/2176-9451.19.3.120-126.oar.

[18] Gift, H. C., and M. Redford. "Oral Health and the Quality of Life." Clinics in Geriatric Medicine 1992: 673–683.DOI:10.1016/S0749-0690(18)30471-3.

[19] Macgregor, F C. "Facial Disfigurement: Problems and Management of Social Interaction and Implications for Mental Health." Aesthetic plastic surgery 14.4 (1990): 249–57. DOI: 10.1097/00006534-199108000-00064.

[20]Choi, Wing Shan et al. "Change in Quality of Life after Combined Orthodontic-Surgical Treatment of Dentofacial Deformities." Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology 109.1 (2010): 46–51. DOI: 10.1016/j.tripleo.2009.08.019.

[21] Motegi, Etsuko et al. "Health-Related Quality of Life and Psychosocial Function 5 Years after Orthognathic Surgery." American Journal of Orthodontics and Dentofacial Orthopedics 124.2 (2003): 138–143. DOI: 10.1016/S0889-5406(03)00391-3.

[22] Modig, Maria, L. Andersson, and I. Wårdh. "Patients' Perception of Improvement after Orthognathic Surgery: Pilot Study." British Journal of Oral and Maxillofacial Surgery 44.1 (2006): 24–27. DOI: 10.1016/j.bjoms.2005.07.016.

[23] Y. Sun and C. Jiang, "The impact ofmalocclusion on self-esteem of adolescents," Chinese journal of stomatology, (2004). vol. 39, no. 1, pp.67–69.

[24] Lee S, Mcgrath C, Samman N. Quality of life in patients with dentofacial deformity: a comparison of measurement approaches. Int J Oral Maxillofac Surg. 2007; 36:488-492. DOI: 10.1016/j.ijom.2007.01.011.

[25] Scariot, Rafaela et al. "Epidemiological Analysis of Orthognathic Surgery in a Hospital in Curitiba, Brazil: Review of 195 Cases." Revista Española de Cirugía Oral y Maxilofacial 32.4 (2010): 147–151. DOI: 10.1016/s1130-0558(10)70034-4.

[26] Bertolini, F., V. Russo, and G. Sansebastiano. "Pre- and Postsurgical Psycho-Emotional Aspects of the Orthognathic Surgery Patient." The International journal of adult orthodontics and orthognathic surgery 15.1 (2000): 16–23. Print.

[27] Desforges, Emmanuelle et al. "The Psychological Impact of Orthognathic Surgery." L' Orthodontie française 78.2 (2007): 113–121. DOI: 10.1051/orthodfr:2007013.

[28] Ürker, N. et al. "Perceptions of Preoperative Expectations and Postoperative Outcomes from Orthognathic Surgery: Part I: Turkish Female Patients." International Journal of Oral and Maxillofacial Surgery 37.8 (2008): 710–715. DOI: 10.1016/j.ijom.2008.04.014.

[29] R. J. Fonseca, R. D. Marciani, T. A. Turvey, and J. Scully, Oral and Maxillofacial Surgery, 2009.

[30] Lee S, Mcgrath C, Samman N. Impact of orthognathic surgery on quality of life. J Oral Maxillofac Surg. 2008; 66:1194-1199. DOI: 10.1016/j.joms.2008.01.006.

[31]Eslamipour F, Najimi A, Tadayonfard A, Azamian Z. Impact of Orthognathic Surgery on Quality of Life in Patients with Dentofacial Deformities. Int J Dent. 2017;2017:4103905. doi:10.1155/2017/4103905.

[32]Maisa O. Al-Sebaei. "Quality-of-Life Assessment in Orthognathic Surgery Patients: The Effect of Orthognathic Surgery on Aesthetic Perception, Psychosocial Well-Being, and Oral Function." International Journal of Dentistry and Oral Health 3.1 (2017): 01–06. DOI: 10.25141/2471-657X-2017-1.0001.

[33]Chaurasia, Nitesh et al. "Assessment of Changes in Quality of Life in Patients with Dentofacial Deformities after Orthognathic Surgery—A Study in Nepalese Population." Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology 30.2 (2018): 111–114. DOI: 10.1016/j.ajoms.2017.10.005.

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