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Evaluation esthetic and functional outcomes after rhinoplasty

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Objective The aim of this study was to determine patient satisfaction in regard to nose appearance and function with the use of a validated questionnaire, before and after rhinoplasty surgery.
Methods A prospective study was conducted among all adult patients who underwent open rhinoplasty including other nasal procedures like septoplasty or turbinoplasty between September 2018 and August 2019 in both public and private hospitals (Sulaimani Surgical Teaching Hospital and Faruk Medical City). The Rhinoplasty Outcome Evaluation (ROE) questionnaire was used to study the patients' view.
Results 100 patients participated in this study by completing the questionnaires and the follow-up period. The main reasons for rhinoplasty in our patients were: aesthetic 54% (n=54), functional 2 %(n=2), and a combination of both in 44% (n=44) patients The mean ROE score of all patients pre-operation was 51.8 (males: 49.04, females 54.74) and the mean score post-operation was 75.22 (males 75.64, females 74.81) at 6 months with no statistically significant gender differences *P*-value=0.79 However, both genders showed a statistically significant improvement between the pre- and post-operative scores (mean difference = 23.42, $P<0.017$). In the pre-operative stage, patients recorded worse score for anxious and insecure ($P<0.05$). There were no difference for gender, age, cause or literacy level in the mean post-operative scores ($P>0.05$).
Conclusions We found that patients who consider themselves anxious before surgery were less satisfied with the result of the procedure. Additionally, rhinoplasty surgery significantly improved patient quality of life regarding nose shape and function.
Keywords patient satisfaction, rhinoplasty, questionnaire, surgery

Introduction

As with any surgical procedure, the evolution of rhinoplasty is based on improved surgical techniques that survive the test of time and increasing patient expectations.[1] Aesthetic rhinoplasty is one of the most requested and most demanding facial aesthetic surgical operations nowadays. It is a complex medical procedure, as it is not simply a surgical treatment of a disease but instead involves the alteration of the appearance and characteristics of the nose and the face in general.[2] Rhinoplasty is arguably one of the most delicate and complex skeletofacial esthetic procedures. Its evaluation is also complex and should include the patients' esthetic goals, nasal function and anatomy and proportion within the face.[3] The ventilatory function of the nose must be considered when performing nasal surgery.[4] Outcomes of any surgical procedure can be measured by quantitative and/or qualitative terms. However, the lack of standardized qualitative assessment makes it difficult to compare objectively the success of different techniques and individual surgeons. Nowadays, one of the effective ways to assess the medical procedures is the self-reporting outcomes making it an important factor in clinical trials that's why, evaluation of quality of life and self-image can be a very good questionnaire to assess the success of any facial aesthetic surgery. Because they systemize the gathered information and allow the objective comparison of procedures by measuring pros and cons after the surgery.[5] Patient satisfaction depends on subjective factors such as patient perception of preoperative appearance, patient expectations, social relationship capacities.[6] Compared with primary rhinoplasty, revision rhinoplasty is a more challenging surgery because it deals with correction of various deformity of previously operated nose, the anatomy of an operated nose differs completely from its normal counterpart. For this reason, revision surgery requires special attention to anatomy, proper diagnosis, and treatment planning are key to successful revision rhinoplasty and are usually based on psychological evaluation, aesthetic analysis, and functional examination.[7] Because nasal anatomy can vary significantly between the individuals and artistic quality vary from surgeon to surgeon , beauty comes in many forms, therefore reliable evaluation of face cannot be undertaken by merely taking measurements.[8] In 2000, Alsarraf et al. created a questionnaire that offered reliability, internal consistency, and validity for several plastic surgeries, including rhinoplasty.[9] This questionnaire, the Rhinoplasty Outcomes Evaluation (ROE), allowed measure of qualitative aspects such as social, emotional, and psychological. The aim of this study was to use ROE pre- and post-operatively to evaluate the satisfaction of patients who underwent rhinoplasty and to determine the relation with patient characteristics and surgery details.

Methods

This study was approved by Kurdistan Board for Medical Speciality prior to initiation. We performed prospective study of all adults who underwent open rhinoplasty between September 2018 and August 2019 in both public and private hospitals (Sulaimani Surgical Teaching Hospital and Faruk Medical City). All patients requested doing rhinoplasty, in addition to septoplasty or turbinoplasty were included in the study. Patients younger than 18 years and with congenital or neoplastic nasal deformities were excluded. We included 100 patients who underwent a pre-operative consultation with an oral and maxillofacial and plastic surgeon and answered

the Rhinoplasty Outcomes Evaluation questionnaire (ROE) Kurdish version. In addition, the questionnaires asked patient's demographic data such as age, sex, education level, psychological aspects, and reason for doing rhinoplasty. Post-operative satisfaction was evaluated by a phone call at 3 and 6 months after surgery, by the same maxillofacial surgeon. The validated Kurdish version of the ROE questionnaire was used and it is composed of six questions (five about nose shape and one about nasal breathing). Each questions scored by the patient on a scale from 0 to 4, where 0 is the most negative answer and 4 the most positive one (Fig. 1). A higher score indicates more satisfaction. A positive difference between post- and pre-operative scores means improvement after intervention. It was also asked if the surgeon explained for the patient what be corrected during rhinoplasty.

Results

After inclusion and exclusion criteria were met, 100 patients participated in this study. The sample was composed of 87 female and 13 male patients. The population was divided into three age groups: 18–29 years old, 30–49 years old and ≥50 years old. The characteristics of the patients are mentioned in detail in Table 1. The reasons for undergoing rhinoplasty were aesthetic in 54% (n=54) of patients, functional in 2% (n=2) and a combination of aesthetic and functional in 44% (n=44). It was also asked if the surgeon explained what would be corrected in the nose surgery and 0% answered not at all,

Table 1. **Patient's demographic data.**

	Frequency	Percent
Gender		
Male	13	13.0
Female	87	87.0
Total	100	100.0
Age		
18-29	41	41.0
30-49	58	58.0
50 and above	1	1.0
Total	100	100.0
Degree		
12 grade and less	34	34.0
Institution	30	30.0
College degree	36	36.0
Total	100	100.0
Cause		
Functional	2	2.0
Aesthetic	54	54.0
Both	44	44.0
Total	100	100.0

فورمی هه لسه نگاننی نه شته رگه ری جوانکاری لووت

1.تا جه ند شیوازی لوتت به دله؟ .

0 .هیچ 1.که م 2.تاراده یه ك 3.زۆر 4.به ته واوی.

2.تا جه ند ده توانیت هه ناسه بده یت له ریی لوتته وه؟.

0. هیچ 1.که م 2.تاراده یه ك 3.زۆر 4.به ته واوی .

3.تا جه ند هاوری و دۆستانت لوتیان به دله؟.

0 .هیچ 1.که م 2.تاراده یه ك 3.زۆر 4.به ته واوی . .

4.شیوه ی ئیستای لوتت ریگره له جالاکی کۆمه لایه تی یان بیشه که ت ؟.

0.هه میشه 1.زۆرجار 2. هه ندیك جار 3.که م جار 4.هه رگیز

5.تاجه ند بروات وایه شیوازی لوتت ئه کریت جوانتربیت له ئیستا؟..

0.هیچ 1.که م 2.تاراده یه ك 3.زۆر 4.به ته واوی.

6.جه زه که یت شیواز یان هه ناسه دان به لوتت بگۆری به نه شته رگه ری؟.

0. بی گومان 1.ئه گه ری زۆره 2.ئه گونجیت 3.تاراده یه ك نه خیر 4.نه خیر

Fig. 1 **Kurdish version of rhinoplasty outcomes evaluation questionnaire.**

Table 2. **Psychological status of the patients.**

	Pre-operative psychology		Psychology after 3 months		Psychology after 6 months	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Calm	44	44.0	67	67.0	79	79.0
Anxious	56	56.0	33	33.0	21	21.0
Total	100	100.0	100	100.0	100	100.0

Table 3. **Mean pre- and post-operative scores and correlation with psychological aspects.**

	Pre-operatively	Post-operatively 3 months	Post-operatively 6 months
Calm			
Mean	54.07	72.99	76.93
SD	15.13	9.64	8.15
Anxious			
Mean	53.94	62.89	70.83
SD	14.75	10.77	12.88
***P*-value**	0.97	0.001	0.017

2% (n=2) answered somewhat, 21% (n=21) answered moderately, 31% (n=31) answered very much, and 46% (n=46) answered completely. Regarding psychological aspects, 56% (n=56) of the patients considered themselves anxious and 44% (n=44) calm pre-operatively and secure patients were 23% and 35% for both calm and anxious patients after 3 months 6 months post-operatively, respectively (Table 2). ROE score of all patients pre-operation was 51.8 (males 49.04, females 54.74.) and the mean score post-operation was 71.13 (males 71.47, females70.79) at 3 months after rhinoplasty and 75.22 (males 75.64, females 74.81) at 6 months after rhinolasty with no statistical differences between males and females *P*-value=0.79. However both genders showed a statistically significant improvement between the pre- and post-operative scores (mean difference = 23.42, $P<0.017$). Also, there was a difference between 3 and 6 months' post-operative scores after 6 months period most of the patient were satisfied with the results. The correlation between psychological aspects and satisfaction is presented in Table 3, showing that anxious patients were significantly less satisfied than calm patients in the pre-operative period. There were no gender, no age, no cause, and no literacy level differences in mean post-operative scores ($P>0.05$). Primary rhinoplasty was performed in 96% and revision rhinoplasty in 4% patients. There was no significant difference in post-operative ROE scores between the two groups.

Discussion

This prospective study involved 100 patients who were evaluated by Kurdish version ROE questionnaire before surgery, at 3 and 6 months post-operatively, to gain more precise results about satisfaction. Results of the present study showed statistically significant improvement in ROE scores after rhinoplasty surgery, demonstrating a high satisfaction level in this patient population. Since rhinoplasty has a huge psychological impact,[10] the result of rhinoplasty was found to have a great impact on the psychological status of the patient while present study observed no significant differences in ROE scores for sex, age, literacy level, reason for doing rhinoplasty, or primary versus revision.

In our study, the mean pre-operative ROE score was 51.8 and the mean post-operative score after 6 months was 75.22, indicating an improvement of 23.42 after surgery. These numbers are not in line with those reported by Alsarraf et al., which found a mean pre-operative score of 38.8 and a mean improvement of 44.5.[11] The reason for that discrepancy is that most of the patients in the present study had already acceptable nose shape because when they were asked about limitation of social activity due the appearance of the nose only one patient (1%)

Table 4. **Rhinoplsaty outcomes evaluation questionnaire (ROE) pre-operation.**

ROE pre-op	Most negative answer	Somewhat	Moderately	Very much	Most positive answer
How well do you like the appearance of your nose	44	28	23	5	0
How well are you will able to breath through your nose	2	29	15	20	34
How much friends like your nose	7	23	37	29	4
Current nasal appearance limits social activities?	1	10	8	14	67
Is nasal appearance the best that can be?	0	2	20	58	20
Would you like surgically alter the appearance and function of your nose?	59	9	6	5	21

Table 5. **Rhinoplsaty outcomes evaluation questionnaire (ROE) 3 months post-operation.**

ROE after 3 months	Most negative answer	Somewhat	Moderately	Very much	Most positive answer
Nose appearance	5	9	19	47	20
Nasal breathing	1	6	20	50	23
How much friends like your nose	2	4	16	58	20
Current nasal appearance limits social activities?	1	4	0	8	87
Is nasal appearance the best that can be?	20	28	22	23	7
Would you like surgically alter the appearance and function of your nose?	5	9	8	27	51

Table 6. **Rhinoplasty outcomes evaluation questionnaire (ROE) 6 months post-operation.**

ROE after 6 months	Most negative answer	Somewhat	Moderately	Very much	Most positive answer
Nose appearance	1	6	11	43	39
Nasal breathing	1	4	14	43	38
How much friends like your nose	2	3	13	49	33
Current nasal appearance limits social activities?	1	1	0	3	95
Is nasal appearance the best that can be?	33	24	19	17	7
Would you like surgically alter the appearance and function of your nose?	6	4	6	19	65

answered that nose shape had always limited social activities and 67 patients (67%) answered never. Although a significant improvement was found in ROE scores in our population, this study focused on a patient population drawn from both public and private hospital, where rhinoplasty is performed in association with other nasal procedures.

In our sample, there were 87 women and 13 men which shows that women are more concerned than men about their physical appearance. Regarding age and education level, the majority of patients were between 30 and 49 years old and had college degree and above, respectively. Prospective studies are really important, since they improve selection of good candidates for surgery and objective assessment of surgery results. This study was conducted in a maxillofacial department of Sulaimani Teaching Hospital comprising senior specialists, residents, and plastic surgery department in Faruk Medical City. Hence, one limitation of the study is that the rhinoplasty was performed by different surgeons with different levels of experience in the aesthetic area. Therefore, expectations in terms of both the pre-operative consultation and the post-operative satisfaction may have been affected by this factor.

Conclusions

We found that patients who consider themselves anxious before surgery were less satisfied with the result of the procedure. Additionally, rhinoplasty surgery significantly improved patient quality of life regarding nose shape and function.

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