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ORIGINAL ARTICLE EXPERIMENTAL/SPECIAL TOPICS

Quality of Life Among Iranian Adults Before and After Rhinoplasty

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Abstract
Background Despite developments in the therapeutic field of cosmetic surgery, there is a little information about the effects of cosmetic procedures on quality of life (QOL), especially in Iran. Rhinoplasty is one of the most common cosmetic surgeries. This type of surgery has remarkable effects on physical and mental health and also improves nasal functioning. The purpose of this study was to survey QOL among Iranian adults before and after rhinoplasty.
Methods In this descriptive and analytical cross-sectional study, from March 2009 to March 2010, data were collected from 75 subjects, 16 years old and above, before and 6 months after rhinoplasty. A trained interviewer interviewed and completed standardized questionnaires investigating QOL, including the SF-36 version 2, NOSE, and Rosenberg questionnaires. Data analysis was conducted using SPSS ver. 16. Results before and after surgery were compared.
Results The mean age of the subjects was 26.05 ± 7.78 years, with a median of 24 years. The female-to-male ratio was 4.35:1. In all cases and all questionnaires, QOL was improved after rhinoplasty. Significant differences were observed on the NOSE questionnaire ($p = 0.005$) and the Rosenberg questionnaire ($p = 0.002$). On the SF-36 questionnaire, significant differences were observed in four subscales, including physical functioning ($p = 0.047$), role of emotion ($p = 0.01$), bodily pain ($p = 0.01$), and vitality ($p = 0.05$).
Conclusions According to this study, QOL is improved after rhinoplasty in Iranian adult patients. With proper patient selection and a successful operation, improvement of physical and mental health can be expected.

Keywords Rhinoplasty · Quality of life · Aesthetic surgery · Cosmetic surgery

Rhinoplasty is one of the most common cosmetic surgeries. Cosmetic surgeries are done to improve function and have a remarkable effect on physical and mental health [1, 2]. Initially, rhinoplasty was confined to repairing damage, but in modern times it has been used to change the nose shape for aesthetic purposes [3].

According to the American Society for Aesthetic Plastic Surgery Reports, cosmetic procedures increased by 147% from 1997 to 2009 [4]. Although there are no exact statistics about cosmetic surgery in Iran because of a lack of registration, the increasing number of rhinoplasty surgeries and those applying for rhinoplasty suggests that rhinoplasty has increased in Iran, and in recent years there has been a greater number of requests from middle-aged people. In Iran, primarily women are interested rhinoplasty. Recently, however, men have also been interested in this operation.

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Despite developments in this therapeutic field, we have little information about the effects of cosmetic procedures on patients' quality of life (QOL) [5]. Researchers have concluded that cosmetic surgeries affect QOL [6–8]. Quality of life is an important long-term outcome for patients receiving cosmetic procedures. The measurement of QOL entails multidimensional assessments of physical, social, psychological, and emotional domains [9].

Studies have shown that patients suffering from visible physical disorders are better candidates for rhinoplasty. Aside from post-trauma rhinoplasty, candidates should be considered carefully, and a psychological consultation should be conducted for vague cases [10].

According to a study by Grossbart and Sarwer [11] investigating the effect of plastic surgery on behavior and mood, self-esteem increased in all patients, and plastic surgery was a positive step in improving QOL. Some studies have shown that cosmetic surgery does not benefit mental health [11–13]. The effect of different cosmetic procedures on QOL has been surveyed in several studies [14–17]. A recent study in Brazil found higher self-esteem in patients 6 months after surgery for asymmetric breasts [18].

As previously mentioned, rhinoplasty is an increasingly performed surgery in Iran, and many applicants are referred to medical centers for this type of procedure. Because of the high cost of this procedure and its important effect on QOL, complementary research is needed. In this study we investigated QOL before and after rhinoplasty using standard questionnaires to survey the effect of rhinoplasty on QOL, and researched other factors such as the motivation for the operation.

Methods

This was a descriptive and analytical cross-sectional study. All individuals over 16 years of age referred to Hazrat Fatemeh Medical Center, Tehran University of Medical Science (the University of Medical Sciences in Tehran, the cosmopolitan center and capital of Iran) from March 2009 to March 2010 for elective rhinoplasty were enrolled in this study. Eighty patients were studied. Five were unable to complete the second-phase questionnaires because of loss to follow-up. Therefore, 75 persons completed the standard QOL questionnaires in both the first and second phases. A trained interviewer interviewed each patient separately and completed a short 36-item health-surgery questionnaire (SF-36 version 2) [18, 19], the Rosenberg self-esteem scale (RSES), and the Nasal Obstructive Symptoms Evaluation (NOSE) [20–22], which were translated and validated for the Iranian population [23, 24]. Demographic characteristics were also collected at the beginning of the questionnaire.

The SF-36 version 2 questionnaire is a brief and multifunctional health survey from the patient's point of view and has 36 questions for people aged 14 years and older. The SF-36 version 2 consists of eight scaled scores that are the minimum standards necessary for psychological study in comparing individuals. These eight scales have 40 items from which the mental and physical component scores are obtained. The RSES questionnaire consists of ten questions about self-esteem, and each question has four options for a total score ranging from 10 to 40. The RSES measures global self-esteem and personal worthlessness; higher scores indicate higher self-esteem. The NOSE scale is designed to assess nasal obstruction. It consists of five questions with five options each and is scored from 0 to 20, with higher scores indicating more severe nasal obstruction.

After collecting the data, the patients underwent rhinoplasty. Six months after surgery, the patients were invited for the second interview. The same questionnaires with the same methodology were completed by the same interviewer. Data analysis was conducted using SPSS ver. 16. Paired-sample *t*-tests and Wilcoxon signed-ranks tests were used to compare the results before and after rhinoplasty. To increase the accuracy of comparison between different scales of the SF-36 version 2 and other questionnaires, a linear transformation was conducted.

Results

As seen in Table 1, the mean age of the 75 subjects was 26.05 ± 7.78 years, with a median age of 24 years. Most subjects (54.67%) were between 16 and 25 years old, and 41.33% were between 26 and 45 years old. Four percent were over 46 years old. The youngest subject was 16 years old and the oldest was 53 years old. The female-to-male ratio was 4.35:1.

The most common education levels reached by the patients were secondary school diploma and university level, with each comprising 45.33% of the study population. Those with a secondary school education comprised 9.33% of the study group, and none of the participants were illiterate.

Most individuals (73.33%) were single, and 26.67% were married. The average number of children that the married subjects had was 2.1 ± 1.4, with a median of 2 and a total number ranging from 0 to 5. None of the participants were divorced or widowed.

Subjects were self-employed (22.67%), housewives (18.67%), employed (17.33%), university students (16%), unemployed (16%), or students (9.33%). The subjects were categorized into three groups according to monthly income. Those with an income of 200–500 US dollars comprised

Table 1 Major characteristics of study participants ($n = 75$)

Mean age (SD)	26.7 ± 7.78
Age range (years)	
16–25 (%)	54.67
26–45 (%)	41.33
>45 (%)	4
Gender	
Male (%)	18.67
Female (%)	81.33
Education	
Secondary school (%)	9.33
Over secondary school diploma (%)	45.33
University (%)	45.33
Marital status	
Not married (%)	73.33
Married (%)	26.67
Occupation	
Unemployed (%)	16
Housewife (%)	18.67
Student (%)	9.33
University student (%)	16
Employed (%)	17.33
Self-employed (%)	22.67
Monthly income	
<$200 (%)	12
$200–$500 (%)	61.33
>$500 (%)	21.33
Missing (%)	5.33
Reason for rhinoplasty	
Therapeutic (%)	4
Cosmetic (%)	53.33
Therapeutic and cosmetic (%)	41.33
Missing (%)	1.34
Family history	
Yes (%)	69.33
No (%)	24
Missing (%)	6.67
Chronic disease history	
Yes (%)	86.7
No (%)	12
Missing (%)	1.3
Complication	
Yes (%)	16
No (%)	70.67
Missing (%)	13.33
Rhinoplasty operation type	
Open (%)	58.67
Closed (%)	14.67
Missing (%)	26.8

61.33% of the study population, while 21.33% had a monthly income greater than 500 U.S. dollars, and 12% had an income less than 200 U.S. dollars. Those participants not answering this question comprised 5.33% of the study group.

Most people (53.33%) mentioned cosmetic reasons as their motivation for rhinoplasty, while 41.33% stated cosmetic-therapeutic reasons and 1.34% declined to answer. The majority (69.33%) had previous experience with cosmetic surgery through relatives having undergone similar procedures; 24% had no such relatives.

No chronic disease history was observed in 86.7% of the study group. Only 12% answered yes to having a chronic disease (e.g., hypothyroid disease, which requires long-term therapy), and 1.3% of the participants declined to answer. Most of the participants (89.3%) did not use a specific medication, whereas 9.4% of the study population used levothyroxin sodium for the treatment of long-term hypothyroidism.

The results of the SF-36 version 2 questionnaire (Table 2) indicated higher scores (better conditions) for all eight subscales. In four subscales, including role of emotion ($p = 0.01$), vitality ($p = 0.05$), physical functioning ($p = 0.047$), and bodily pain ($p = 0.01$), there was a statistically significant difference before and after rhinoplasty. In the four other subscales, including physical roles ($p = 0.37$), social functioning ($p = 0.87$), general health ($p = 0.99$), and mental health ($p = 0.42$), no statistically significant differences were observed. Two scales of the SF-36 version 2 questionnaire (Table 3), general health ($p = 0.15$) and mental health ($p = 0.27$), were improved, but statistically significant differences were not observed.

In the Rosenberg questionnaire, the mean score before rhinoplasty was 22.4 ± 2.4. After surgery, the mean score increased to 23.6 ± 2.4. These results indicate that there were no statistically significant differences observed in the RSES scale ($p = 0.002$).

The mean score before rhinoplasty on the NOSE questionnaire was 4.94 ± 6.51, and after surgery the mean score decreased to 2.25 ± 3.4. No statistically significant differences were observed between before and after rhinoplasty in terms of breathing conditions ($p = 0.005$).

Discussion

Quality-of-life assessments are important indicators of overall health. The assessment of QOL is deeply rooted around the world and is widely used in developing countries, but in Iran it is very new. Many types of questionnaires have been used to assess QOL, such as the SF-36 version 2, NOSE, and Rosenberg questionnaires, and they have been translated for use in other countries, including

Table 2 Subscale results of SF-36 questionnaire before and after rhinoplasty

	Mean	SD	Score	*Z*	*p*
Physical functioning					
Before	26.65	3.46	88.25		
After	28.62	1.69	94.1	−1.99	0.047
Physical role					
Before	7.31	1.05	20.69		
After	7.40	1.06	21.25	−0.9	0.37
Bodily pain					
Before	9.83	2.03	78.3		
After	10.78	1.88	87.8	−2.64	0.01
Vitality					
Before	16.49	3.07	62.45	−1.97	0.05
After	17.37	3.04	66.85		
Social functioning					
Before	8.42	1.78	80.25		
After	8.51	1.36	81.37	−0.16	0.87
Emotional role					
Before	5.07	1.03	17.25		
After	5.51	0.92	20.92	−20.92	0.01
General health					
Before	20.15	3.34	75.75		
After	20.27	3.32	76.35	−0.8	0.42

Table 3 SF-36 questionnaire score comparisons before and after rhinoplasty

	Mean	SD	*T*	*p*
Physical health				
Before	65.29	6.58		
After	67.09	5.56	−1.46	0.15
Mental health				
Before	50.75	9.11		
After	52.21	8.32	−1.1	0.27
Final score				
Before	117.25	12.56		
After	118.75	12.97	−0.74	0.47

T Student's *t* test

Iran [23, 24]. The ease of use, the simple scoring system, and the interpretability of final scores are among the advantages of these questionnaires.

The present study indicates that Iranians who are interested in rhinoplasty have a mean age of 26 years. Almost all applicants (96%) were under 45 years old, and most (81.33%) were female. This shows the greater tendency of women and girls to undergo these types of surgeries. Based on data from previous studies, these results were expected. In a study by Haraldsson in Sweden [25] that observed rhinoplasty on 64 people, the mean age was 31 years and 68.75% were female. The education level was secondary school in 9.3%, and none were illiterate, which indicates that people with less education do not show a greater tendency for these surgeries, mainly due to the high cost of such surgeries and the low income rate of this group. As we mentioned previously, only 12% of applicants had a monthly income of less than 200 U.S. dollars. However, more information about this issue is required.

The occupation distribution in the Haraldsson study was also similar to ours as only 16% were unemployed. The majority of our participants (73.33%) were single, indicating a greater tendency for surgery in this group. Although applicants were informed that their data would be kept confidential, it is possible that subjects did not provide correct responses to the questionnaires. This could be due to insurance reasons regarding cosmetic or therapeutic surgery. Therefore, the value of 41.33% who declared cosmetic-therapeutic reasons for surgery is unreliable. The high rate (70%) of history of cosmetic surgery in relatives was very surprising, and this may have been an incentive for surgery. Also, hereditary characteristics may be the reason for this high percentage of rhinoplasty and cosmetic surgeries in relatives. In the Haraldsson study, 89% of those who underwent rhinoplasty suggested it to others [26]. This might be due to a decreased fear of surgery or the positive advantages of cosmetic procedures. The results of our study based on the SF-36 version 2, NOSE, and Rosenberg questionnaires indicate that QOL changes after rhinoplasty. These changes are improved physical performance, mental condition, mental health, vitality and freshness, self-esteem, and breathing. In a study by Klassen et al. [2], QOL was evaluated before and 6 months after cosmetic surgery. The results showed that QOL evaluated with the SF-36 version 2 questionnaire improved significantly in all eight subscales, and even in a group showing no changes in QOL, four subscales, i.e., physical performance, role of emotion, social performance, and mental health, showed statistically significant differences before and after surgery [2].

Cook and colleagues [14] found that cosmetic surgery could positively affect self-esteem. This result must be interpreted with caution because studies regarding these issues are generally made with inappropriate control groups and a short-term follow-up course. A recent study by Neto et al. [18] showed QOL and self-esteem improvements 6 months after cosmetic breast surgery using the SF-36 version 2 and Rosenberg questionnaires. Self-esteem, bodily pain, vitality and freshness, role of emotion, and mental health were statistically significantly different compared with before surgery. The results of that study are very similar to our results. The only difference

was the statistically significant difference observed in the mental health subscale in the Neto et al. [18] study compared with the significant difference observed on the physical functioning scale in our study.

A study by Hellings et al. [26] indicated that rhinoplasty caused an increase in personal satisfaction. Similar to our study, a study by Litner et al. [27] showed that rhinoplasty caused an increase in QOL.

Conclusions

QOL is an important indicator of overall health. In recent years, the focus on patient-centered issues has provided opportunities to investigate the effect of cosmetic procedures. Available data indicate that cosmetic interventions have a positive effect on QOL. As our study showed, it seems that rhinoplasty is capable of creating a positive effect on appearance and improves physical performance, mental health, vitality and freshness, self-esteem, breathing, and QOL. Statistically significant differences in physical functioning, bodily pain, vitality, and role of emotion were observed 6 months after rhinoplasty. It means that careful patient selection and a successful operation can improve mental and physical health.

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