



Evaluation of Quality of Life After Rhinoplasty

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ABSTRACT

Introduction

Rhinoplasty is the most common cosmetic surgery performed by otorhinolaryngologist and plastic surgeons. It can be done for both aesthetic and functional purposes. Quality of life of the patient becomes important, so in this study we will assess the quality of life of patients using outcome evaluation scores.

Materials and Methods

This prospective longitudinal clinical study was performed on patients who visited to Department of Otorhinolaryngology from March 2023 to April 2024 and underwent open rhinoplasty. Rhinoplasty Outcomes Evaluation (ROE) and Rhinoplasty Health Inventory and Nasal Outcomes (RHINO) was applied to all patients and evaluated pre and post operatively. Results obtained and statistically assessed.

Results

A total of 16 patients were studied, which shows improvement of ROE and RHINO scores from preoperative to postoperative and followed by 3 months.

Conclusion

The statistical significance of the improvements seen at the 3-month and postoperative follow-up points to the fact that rhinoplasty produces notable and long-lasting gains in both functional and cosmetic results.

Keywords

Rhinoplasty; Quality of life; Cosmetic Surgery; Patient Satisfaction

A person's perspective of their circumstances in relation to their goals, expectations, standards, and worries, as well as the cultural and value system in which they live, is known as their quality of life. As a result, it is an idea of a full image that may be achieved through a variety of artistic interventions.¹

Evaluating results Post-rhinoplasty is a vital component of cosmetic surgery that evaluates patient satisfaction and the influence of surgical procedures on the quality of life.²

In addition to enhancing aesthetics, rhinoplasty can address practical concerns, like respiratory difficulties or nose obstructions.

The evaluation of treatment efficacy and results in

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rhinoplasty can be conducted by many objective or subjective metrics. Subjective quality-of-life assessments have become increasingly significant in evaluating outcomes following any surgeries. This principle applies to cosmetic nose surgery, where patient satisfaction is the paramount sign of a good outcome, and is equally relevant to functional rhinoplasty.³

Several quality-of-life assessments have been created to evaluate patient-reported outcomes following nose surgery.³ Here, in this study we have used ROE (Rhinoplasty Outcome Evaluation) and RHINO (Rhinoplasty Health Inventory and Nasal Outcomes) scores to evaluate the outcome of rhinoplasty procedure.

Clearly, patients must express satisfaction with both functional as well as cosmetic benefits in order for rhinoplasty to be effective.

The aim and objective of this study is assess the quality of life of patients after rhinoplasty using outcome evaluation scores.

Materials and Methods

It is a prospective longitudinal clinical study performed on patients who visited to Department of Otorhinolaryngology from March 2023 to April 2024 and underwent rhinoplasty after obtaining consent. Total of 16 patients were included in the study.

ROE and RHINO score was applied to all patients and evaluated pre and post operatively.

ROE-Easy-to-use questionnaire that allows comprehensive assessment of rhinoplasty-related patient satisfaction. ROE comprises six questions : five pertaining to the cosmetic dimensions of surgery and one addressing the functional result of the procedure. Responses to each question were rated on a scale from 0 to 4, where 0 represented the most negative reaction and 4 denoted the most favorable one. The total score is calculated by adding up the scores for each question, and then dividing by 24 and multiplying by 100 to get a score between zero and 100.

RHINO- This a 10-item questionnaire to evaluate outcomes in 3 health domains- physical, mental, and social well-being. Each item in the survey is scored on a Likert scale from 1 to 5, with high numbers indicating greater satisfaction. The 10-item scores are then summated and multiplied by 2, to create a final score on a 100-point scale.

Results obtained and were statistically assessed.

The statistical analysis was done using SPSS 23.0. The categorical variables were represented in frequency and percentage. Numerical variables were represented using mean and standard deviation. ROE and RHINO across the time points were analyzed using Repeated measures of ANOVA followed by Bonferroni test. A p values <0.05 was considered statistically significant.

Results

The age of the participants in the study ranged from 18 to 50 years, with a mean age of 29.06 ± 9.59 years. The

study included a total of 16 participants, of which 9 (56.3%) were male and 7 (43.8%) were female. The primary indications of participants showed among the 16 participants, 4 (25.0%) reported aesthetic concerns, 4 (25.0%) had functional complaints, and 8 (50.0%) presented with both aesthetic and functional issues (Table I).

Table I: Showing age, gender and indication of the participants

	N	MEAN	STD. DEVIATION
Age	16	29.063	9.588
		Frequency	Percent
Gender	Female	7	43.8
	Male	9	56.3
	Total	16	100.0
Indication	Aesthetic	4	25.0
	Functional	4	25.0
	BOTH	8	50.0
	Total	16	100.0

The study evaluated the ROE scores at three different time points: preoperative, postoperative, and three months postoperatively. The mean preoperative ROE score was 32.29 ± 5.79 , which increased significantly to 54.69 ± 8.42 postoperatively and further improved to 75.11 ± 8.08 at three months. The analysis showed a statistically significant difference across the time points ($F = 153.682$, $p < 0.001$). The ROE scores showed significant improvements across all time points. The mean differences were -22.40 (preoperative vs. postoperative), -42.82 (preoperative vs. three months postoperatively), and -20.42 (postoperative vs. three months postoperatively), all with highly significant p-values ($p < 0.001$) (Table II, III, Figure 1).

Table II: Showing ROE scores at different time points

ROE	MEAN	STD. DEVIATION	N	F VALUE	P VALUE
pre	32.288	5.793	16	153.682	p<0.001
post	54.688	8.423	16		
3M	75.113	8.081	16		

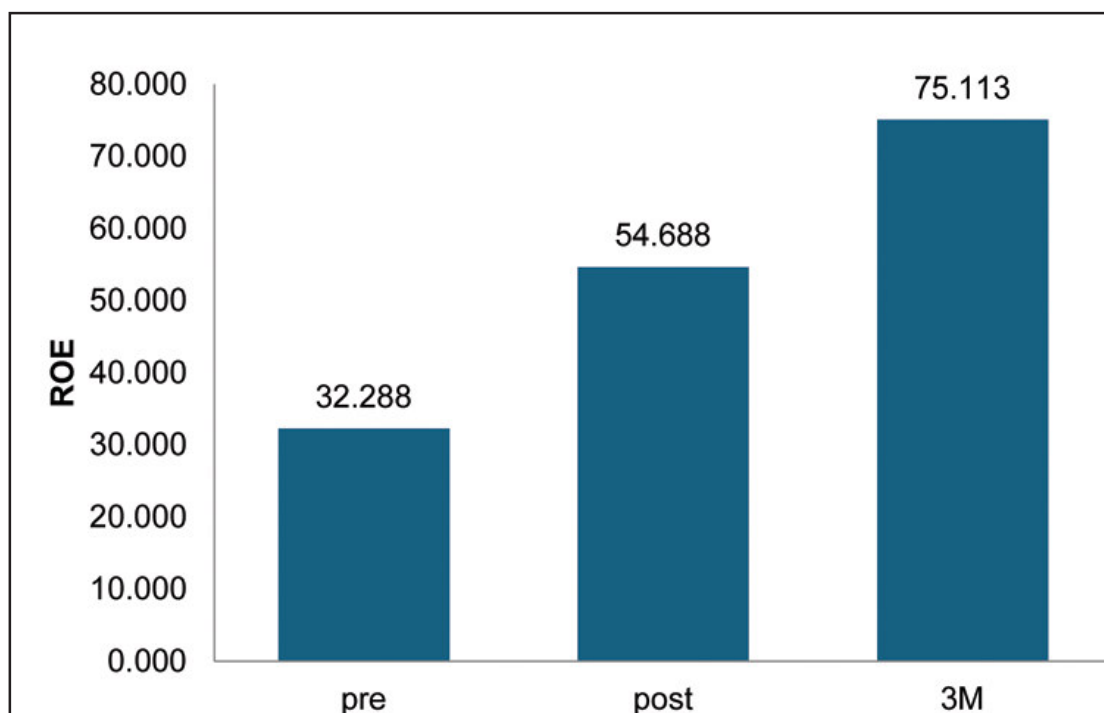


Fig. 1. Representing mean of ROE score in pre, post and 3 months postoperative period

Table III: Showing pairwise comparison of ROE

(I) FACTOR		MEAN DIFFERENCE (I-J)	STD. ERROR	P VALUE	95% CONFIDENCE INTERVAL FOR DIFFERENCE	
					LOWER BOUND	UPPER BOUND
Pre	Post	-22.400*	2.394	.000	-28.850	-15.950
	3m	-42.824*	2.553	.000	-49.701	-35.948
Post	3m	-20.424*	2.380	.000	-26.835	-14.014

The study assessed the RHINO scores at three time points: preoperative, postoperative, and three months postoperatively. The mean preoperative score was 42.31 ± 4.62 , which increased significantly to 50.75 ± 2.91 postoperatively and further to 84.25 ± 5.11 at three months. The analysis revealed a highly significant difference across the time points ($F = 382.806$, $p < 0.001$). The results show significant improvements in RHINO at all time points. The mean differences were -8.438 (preoperative vs. postoperative), -41.938 (preoperative vs. three months postoperative), and -33.500 (postoperative vs. three months postoperative), all with

p-values less than 0.001, indicating significant reductions across the time points (Table IV, V, Figure 2).

Aesthetic procedures shows higher improvements in ROE scores, whereas functional procedures show steady improvement in RHINO score. Patients who underwent for both aesthetic and functional purpose showed balanced improvements in both scores.

Table IV: Showing RHINO scores at different time points

RHINO	MEAN	STD. DEVIATION	N	F VALUE	P VALUE
pre	42.313	4.615	16	382.80	p<0.001
post	50.750	2.910	16		
3m	84.250	5.106	16		

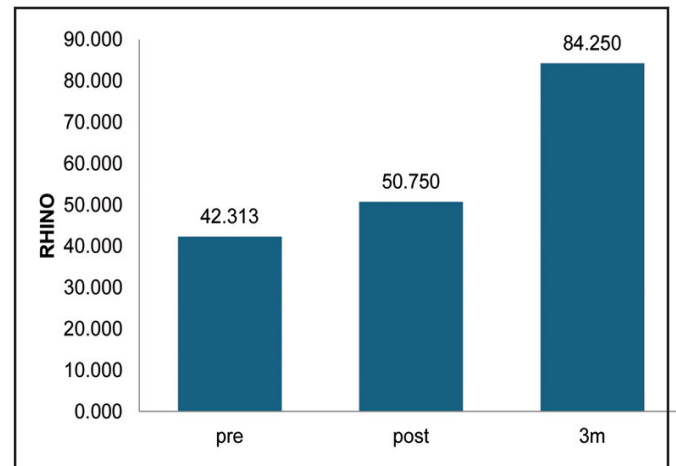


Fig. 2. Representing mean of RHINO score in pre, post and 3months postoperative period

Table 5 : Showing pairwise comparison of RHINO score

(I) FACTOR		MEAN DIFFERENCE (I-J)	STD. ERROR	P VALUE	95% CONFIDENCE INTERVAL FOR DIFFERENCE	
					LOWER BOUND	UPPER BOUND
Pre	Post	-8.438*	.987	.000	-11.097	-5.778
	3m	-41.938*	2.030	.000	-47.406	-36.469
Post	3m	-33.500*	1.618	.000	-37.857	-29.143

Discussion

This study aimed to evaluate the aesthetic and functional outcomes following rhinoplasty, using the ROE and RHINO scores at three distinct time points: preoperative, postoperative, and three months postoperatively. The study involved 16 participants, aged 18 to 50 years, with a gender distribution of 56.3% male and 43.8% female.

The primary indications for surgery included aesthetic concerns (25%), functional complaints (25%), and a combination of both (50%). Our findings showed significant improvements in both ROE and RHINO scores across all time points, with notable increases in both aesthetic and functional domains.

In our study, the mean age of 29.06 ± 9.59 years was

noted. The mean age of presentation in a study was 34.9 years in a study by Lee MK et al,³ 44.8 years in a study by Chang et al⁴ and 36.3 years in a study by Rabaioli et al.⁵ The age group of 25-35 years exhibits a heightened need for social acceptance and experiences greater negative effects due to unrealistic pressures to conceal facial imperfections in this era. Therefore, it is essential to provide comprehensive counseling and guidance to these age groups of patients to enhance postoperative surgical satisfaction.

In this study, there were a total of 16 participants, comprising 9 males (56.3%) and 7 females (43.8%). This finding aligns with the research conducted by Bilgin E et al. (2020)⁶ Khansa I et al. (2015)⁷ reported greater satisfaction among females, whereas Sozen et al. (2017)⁸ found no significant difference in surgical outcome satisfaction between male and female patients. This observation may have originated from a heightened concern among females regarding their facial appearance in contrast to their male counterparts.

The ROE questionnaire assesses several factors including respiratory function, quality of life and cosmetic appearance.

The ROE scores, which primarily assess aesthetic outcomes, revealed significant improvements. The mean preoperative score was 32.29 ± 5.79 , which increased to 54.69 ± 8.42 postoperatively. The differences between the time points were highly significant ($p < 0.001$), supporting the effectiveness of surgical intervention for improving the aesthetic appearance of the nose. This is similar to research by Arima et al.⁹ and Cngi C and Eskiizmir G,¹⁰ who found that the ROE score increased by 50.5 and 56.3 points, pre and postoperatively. Nevertheless, the research conducted by Meninguad et al. (2008)¹¹ and Bulut OC et al. (2015)¹² demonstrated modest enhancements of 30.4 and 21.7 points, respectively.

These numbers are in line with those reported by Alsarraf et al., which found a mean pre-operative score of 38.8 and a mean improvement of 44.5.¹³

Regarding functional outcomes, the RHINO scores demonstrated significant improvements as well, with a mean preoperative score of 42.31 ± 4.62 , which increased

to 50.75 ± 2.91 postoperatively and 84.25 ± 5.11 at three months. The analysis showed highly significant improvements between the time points ($p < 0.001$), with the most substantial gains observed between the preoperative and three-month postoperative periods. These results suggest that functional improvements, particularly related to nasal airflow and obstruction, require more time to manifest compared to aesthetic changes. This is similar to research by Abianeh et al.¹⁴ who found that RHINO score increased from 64.13 ± 11.43 to 83.36 ± 11.03 , which was statistically significant ($P < 0.001$). Therefore, RHINO is better for detailed, comprehensive evaluations that include both function and psychological well being.

Both these results highlight the lasting benefits of rhinoplasty for improving appearance, nose function, and mental health. The consistent results at all time points show that rhinoplasty can significantly improve patients quality of life.

It is also important to note that the greatest improvements were observed 3 months postoperative, suggesting that while patients report immediate improvements after surgery, the most noticeable benefits are often realized after a few months of healing. The 3-month time frame should, therefore, be considered as a critical period for evaluating the final results of rhinoplasty in clinical practice, as many of the benefits become most apparent at this stage. Surgeons should be aware that while immediate postoperative results are encouraging, patients might continue to experience improvements during the early recovery phase.

One interesting observation in our study was that patients who underwent surgery for both aesthetic and functional concerns demonstrated balanced improvements in both ROE and RHINO scores. There aren't many research on outcome evaluation in this part of the nation. Thus, our research becomes significant in this context.

Conclusion

In conclusion, the statistical significance of the improvements observed at postoperative and 3-month follow up suggests that rhinoplasty leads to significant and

lasting improvements in both functional and aesthetic outcomes. The most substantial changes were observed from preoperative to 3 months postoperative, with continued positive effects.

These results highlight the lasting benefits of rhinoplasty for improving appearance, nose function, and mental health. The consistent results at all time points show that rhinoplasty can significantly improve patients' quality of life.

The use of both the ROE and RHINO scores provides a comprehensive assessment of both aesthetic and functional outcomes, allowing for a holistic evaluation of surgical impact. Additionally, the inclusion of multiple time points (preoperative, postoperative, and three months postoperatively) strengthens the findings by providing a more nuanced view of the trajectory of improvements over time.

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