

Keywords

Patient, Clinic, Rhinoplasty, Surgery, Outcomes

Authors

¹Elman Azimov

¹Azerbaijan Medical University.
0000-0003-4355-329X

²Dilara Azimli

²ENT plastic surgeon Vimay Medical Center
0009-0007-7316-921X

³Saatova Aydan

³Kharkov Medical University
0009-0005-3616-6605

⁴Rufat Azimli

⁴Azerbaijan Medical University
0009-0007-7227-8262

Received-20-05-2026

Revised-24-06-2026

Accepted-28-06-2026

Doi:10.1922/ejprd.v34i4s.1454

Patient Outcomes and Clinic After Rhinoplasty Surgery

ABSTRACT

Objective: This study aimed to evaluate the aesthetic and functional outcomes, as well as patient satisfaction, following rhinoplasty with a focus on tip reconstruction using both traditional and modified surgical techniques.

Methods: A total of 300 patients (215 females, 85 males) underwent rhinoplasty, with 146 patients receiving traditional tip surgery and 154 undergoing the modified technique. Aesthetic outcomes, including tip projection, supratip and infratip collapse, alar width, columella width, and nasal dorsum contour, were assessed preoperatively and six months postoperatively. Patient-reported satisfaction, functional improvement in breathing, psychological wellbeing, and social confidence were measured using a structured questionnaire and analyzed statistically with SPSS, including descriptive statistics, Pearson correlations, ANOVA, and reliability tests.

Results: Preoperative assessments showed comparable baseline aesthetic measures between groups. Six months postoperatively, significant improvements were observed in tip projection, reduction in supratip and infratip collapse, and overall nasal symmetry, particularly in the modified technique group (e.g., supratip collapse: 0.4 ± 0.1 vs 0.1 ± 0.02). Patient satisfaction scores were uniformly high across all parameters, including aesthetic appearance, breathing function, psychological comfort, and social confidence (mean scores ~13–14/15; Cronbach's $\alpha = 0.938$). Strong positive correlations were identified between surgeon professionalism, improvement in breathing, social outcomes, and willingness to recommend the clinic ($p < 0.01$). No significant differences were found in satisfaction based on gender.

Conclusion: Rhinoplasty with tip reconstruction, especially using the modified technique, resulted in significant improvements in both aesthetic and functional outcomes. Patients reported high satisfaction levels, improved psychological wellbeing, and positive social impacts. The use of targeted suturing techniques enhanced tip definition, symmetry, and natural appearance while minimizing the need for additional grafts. These findings support the clinical efficacy and patient-centered benefits of refined rhinoplasty approaches.

INTRODUCTION

Rhinoplasty is one of the most commonly performed aesthetic surgical procedures worldwide, aiming not only to improve nasal appearance but also to enhance functional outcomes and patient quality of life (QoL) (Yang et al., 2018). Historically, rhinoplasty was primarily focused on achieving an ideal nasal shape; however, contemporary practice emphasizes a holistic approach that incorporates both aesthetic refinement and the preservation or restoration of nasal airway function (Barone et al., 2017). Patient satisfaction following rhinoplasty is influenced by multiple factors, including psychological wellbeing, functional improvement, and aesthetic outcome, making comprehensive outcome assessment essential for clinical success (Wähmann et al., 2018). Validated patient-reported outcome measures (PROMs), such as the Rhinoplasty Outcome Evaluation (ROE) and the Nasal Obstruction Symptom Evaluation (NOSE), have become standard tools for quantifying both functional and aesthetic results, as well as overall patient satisfaction (Yang et al., 2018; Barone et al., 2017).

Systematic reviews have demonstrated that rhinoplasty is associated with significant improvements in patient satisfaction and QoL across multiple domains, including self-esteem, social confidence, and breathing function (Yang et al., 2018; Cingi & Eskiizmir, 2013). Nonetheless, specific outcome patterns may vary depending on surgical technique, preoperative nasal deformity, and individual patient expectations (Strazdins et al., 2018).

Despite increasing utilization of PROMs and objective measurements, controversy remains regarding optimal approaches for addressing complex tip anatomy, supratip and infratip collapse, and nostril symmetry—features that significantly influence aesthetic outcomes (Barone et al., 2017). Furthermore, the relationship between subjective satisfaction and objective clinical changes has not been fully elucidated, particularly in comparative studies involving traditional versus modified rhinoplasty techniques.

In light of these gaps, the present study evaluates both aesthetic indicators (i.e., nasal tip projection, dorsum contour, alar width, and columella width) and patient-reported satisfaction outcomes before and six months after rhinoplasty. By correlating clinical measurements with validated PROMs, this research aims to provide a comprehensive assessment of surgical outcomes and identify key predictors of patient satisfaction. Rhinoplasty outcomes are influenced not only by surgical technique but also by individual anatomical variations, such as tip thickness, alar cartilage shape, and skin elasticity, which can affect both aesthetic and functional results (Sena Esteves et al., 2017). Recent studies emphasize the importance of tip reconstruction and suturing techniques in achieving optimal nasal contour, nostril symmetry, and long-term stability of results (Barone et al., 2017; Wähmann et al., 2018). Additionally, psychological factors, including patient expectations and baseline self-esteem, have been shown to modulate satisfaction with postoperative outcomes, highlighting the need for comprehensive patient-centered assessment (Strazdins et al., 2018; Cingi & Eskiizmir, 2013). Despite advances in surgical methods, literature suggests variability in patient satisfaction between traditional rhinoplasty approaches and modified techniques that focus on structural preservation and tip refinement (Yang et al., 2018). Objective measurement of nasal parameters alongside validated patient-reported outcome measures (PROMs) allows for a more precise evaluation of both the functional and aesthetic impact of surgery (Barone et al., 2017). In particular, the correlation between improved nasal airflow, reduced supratip or infratip collapse, and enhanced psychosocial outcomes remains a key area of clinical interest (Sena Esteves et al., 2017; Wähmann et al., 2018).

Study Objectives: In this study, we aimed to assess postoperative outcomes in patients undergoing rhinoplasty with a focus on tip reconstruction. Specifically, we examined:

1. Changes in aesthetic measures, including nasal tip projection, columella width, alar base width, and supratip/infratip contour.

2. Functional improvements in breathing and nasal airflow.

3. Patient-reported satisfaction, psychological wellbeing, and social confidence using validated PROMs.

4. Associations between clinical outcomes and patient satisfaction to identify predictors of positive postoperative results.

By combining objective surgical measurements with patient-centered outcome evaluation, this research seeks to provide evidence for best practices in rhinoplasty that optimize both aesthetic and functional results, ultimately enhancing overall patient satisfaction (Yang et al., 2018; Barone et al., 2017; Sena Esteves et al., 2017).

Objective measurements demonstrated increased nasal tip projection, improved columella and alar symmetry, and a reduction in supratip and infratip collapse, particularly among patients treated with modified tip reconstruction techniques (Sena Esteves et al., 2017; Barone et al., 2017). Functional outcomes, including nasal airflow and breathing ease, were also markedly enhanced, supporting prior evidence that rhinoplasty can simultaneously achieve aesthetic refinement and airway improvement (Yang et al., 2018; Wähmann et al., 2018).

Patient-reported outcome measures indicated high levels of satisfaction across multiple domains, including aesthetic appearance, psychological wellbeing, and social confidence. The majority of patients reported that the surgical results met or exceeded their expectations, and improvements in self-esteem and social interactions were strongly correlated with both functional gains and aesthetic enhancements (Cingi & Eskiizmir, 2013; Strazdins et al., 2018). Statistical analysis confirmed that surgeon professionalism, postoperative functional improvement, and perceived symmetry were significant predictors of overall satisfaction, aligning with prior studies that highlight the multifactorial determinants of postoperative contentment (Yang et al., 2018; Barone et al., 2017).

The integration of clinical measurements with patient-centered evaluations underscores the importance of using both objective and subjective metrics to assess rhinoplasty outcomes comprehensively. This approach allows for the identification of factors that most strongly influence patient satisfaction and provides a framework for refining surgical techniques to optimize both appearance and function. Overall, these findings reinforce the value of meticulous surgical planning and individualized treatment strategies in achieving successful rhinoplasty results and enhancing patient quality of life (Sena Esteves et al., 2017; Wähmann et al., 2018).

PATIENT-REPORTED OUTCOME MEASURES (PROMS) IN RHINOPLASTY

Patient satisfaction and subjective experience are increasingly recognized as essential components for evaluating the success of rhinoplasty surgery. Traditional clinical assessment of rhinoplasty outcomes has focused largely on objective measurements of nasal

form and function. However, these objective parameters do not always capture how patients perceive the results of their surgery or the impact on their quality of life. To address this gap, patient-reported outcome measures (PROMs) have emerged as standardized tools that quantify patients' perspectives on both functional improvements and aesthetic satisfaction following rhinoplasty (Barone et al., 2017). PROMs offer clinicians systematic insight into the domains that matter most to patients, including breathing quality, self-esteem, social functioning, and overall contentment with surgical outcomes. Among the most widely used PROMs in rhinoplasty research are the Rhinoplasty Outcome Evaluation (ROE) and the Nasal Obstruction Symptom Evaluation (NOSE) questionnaires. The ROE instrument assesses aesthetic satisfaction and overall quality of life related to nasal appearance, while the NOSE scale focuses on functional symptoms associated with nasal airflow (Yang et al., 2018). These measures have been validated in multiple studies and are recommended for both clinical practice and research to provide a comprehensive understanding of surgical impact from the patient's perspective (Barone et al., 2017; Wähmann et al., 2018).

Systematic reviews have demonstrated that rhinoplasty generally leads to significant and meaningful improvements in PROM scores, indicating enhanced patient satisfaction and quality of life postoperatively (Yang et al., 2018). For example, patients often report not only better breathing and reduced nasal obstruction but also heightened psychosocial wellbeing including increased self-confidence and improved social interactions (Cingi & Eskiizmir, 2013; Strazdins et al., 2018). Moreover, integrating PROMs with objective clinical data enables a more nuanced evaluation of surgical techniques, revealing how subtle differences in surgical approach can translate into differential patient

experiences and satisfaction outcomes. Nevertheless, the literature also highlights variability in PROM responses based on factors such as baseline psychological status, preoperative expectations, and the complexity of nasal deformities (Strazdins et al., 2018). These findings underscore the importance of preoperative counseling and the use of PROMs not only as outcome measures but also as tools for aligning surgical goals with patient expectations. By incorporating PROMs into routine outcome assessment, clinicians can more accurately gauge both functional and aesthetic success while tailoring care to individual patient priorities.

Use of PROMs in rhinoplasty has provided valuable insight into the patient experience and the multidimensional impact of surgery. Studies consistently show that PROMs capture both functional and psychosocial improvements, such as enhanced breathing, reduced nasal obstruction, and increased self-confidence in social interactions, which often correlate strongly with aesthetic satisfaction (Yang et al., 2018; Cingi & Eskiizmir, 2013). By combining PROMs with objective clinical measures, clinicians can better understand how surgical techniques, including tip reconstruction and subtle adjustments in nasal contour, affect patient-perceived outcomes (Barone et al., 2017; Wähmann et al., 2018). Furthermore, these measures help identify predictors of satisfaction, such as preoperative expectations, baseline psychological status, and the surgeon's technical expertise, emphasizing the need for personalized preoperative counseling and shared decision-making (Strazdins et al., 2018). Overall, PROMs offer a standardized, patient-centered framework that complements traditional clinical assessment, guiding both surgical planning and postoperative evaluation to maximize both functional and aesthetic success.



Traditional assessments focusing solely on objective anatomical changes—such as nasal tip projection, dorsum contour, and alar width—do not fully capture the multifaceted experience of the patient. PROMs, including instruments like the Rhinoplasty Outcome Evaluation (ROE) and Nasal Obstruction Symptom Evaluation (NOSE), bridge this gap by measuring both aesthetic satisfaction and functional improvements, providing a holistic view of surgical outcomes

(Yang et al., 2018; Barone et al., 2017). Through these tools, clinicians can quantify patient perceptions of breathing improvement, reduction in nasal obstruction, enhancement of nasal symmetry, and overall satisfaction with the appearance of the nose, which are often closely intertwined with psychosocial factors such as self-esteem, social confidence, and emotional wellbeing (Cingi & Eskiizmir, 2013; Strazdins et al., 2018). Longitudinal studies employing PROMs have demonstrated that these measures can track changes over time, revealing patterns in recovery and identifying areas where postoperative interventions or refinements may be beneficial.



For example, patients undergoing modified tip reconstruction techniques frequently report higher levels of satisfaction with both form and function compared to those receiving traditional methods, even when objective measurements such as tip projection or alar width show minimal differences between groups (Sena Esteves et al., 2017; Wähmann et al., 2018). These findings underscore the importance of considering subjective patient experiences in surgical planning, as small adjustments in technique can have significant impacts on perceived outcomes. Furthermore, PROMs serve as valuable tools for preoperative counseling, helping to align patient expectations with achievable surgical outcomes. Studies indicate that patients with clear, realistic expectations who are informed about potential aesthetic and functional improvements tend to report higher postoperative satisfaction, while those with unaligned expectations may experience dissatisfaction despite objectively successful procedures (Strazdins et al., 2018). This emphasizes the dual role of PROMs not only as evaluative instruments but also as guides for communication between surgeon and patient, facilitating shared decision-making and enhancing trust in the clinical process. Integration of PROMs with clinical and surgical data also allows for the identification of predictors of patient satisfaction. Factors such as the surgeon's technical expertise, the degree of nasal obstruction correction, and the refinement of tip contour have been shown to correlate strongly with postoperative contentment (Barone et al., 2017; Yang et al., 2018). By analyzing these relationships, clinicians can continuously refine techniques, anticipate patient concerns, and implement

targeted strategies to improve outcomes across both functional and aesthetic domains.

Ultimately, the use of PROMs in rhinoplasty provides a comprehensive framework for evaluating surgical success, extending beyond traditional anatomical measurements to encompass the patient's lived experience. This patient-centered approach ensures that surgical interventions are not only technically successful but also meaningful from the perspective of those who undergo them, fostering higher satisfaction, improved psychosocial wellbeing, and enhanced overall quality of life (Cingi & Eskiizmir, 2013; Sena Esteves et al., 2017; Wähmann et al., 2018). As the field continues to evolve, PROMs are likely to remain central to evidence-based practice, guiding both clinical decision-making and the development of innovative surgical techniques that prioritize outcomes valued most by patients.

METHODOLOGY

In this study, a total of 300 patients who underwent rhinoplasty were included to evaluate both clinical outcomes and patient-reported satisfaction. Among these patients, 215 were female and 85 were male, reflecting the typical gender distribution observed in elective rhinoplasty procedures (Sena Esteves et al., 2017). Patients were divided into two groups according to the surgical technique applied: 146 patients underwent traditional tip reconstruction, while 154 patients received a modified surgical approach aimed at optimizing nasal tip definition and overall nasal symmetry. All patients were assessed preoperatively and at six months postoperatively to capture both immediate and medium-term outcomes (Barone et al., 2017; Wähmann et al., 2018). A combination of

objective and subjective measures was used to evaluate outcomes. Objective clinical parameters included nasal tip projection, alar width, columella width, nasal dorsum contour, and supratip and infratip collapse, which were measured using standard anthropometric techniques and photographic analysis (Yang et al., 2018). Functional assessment focused on breathing quality and nasal airflow, evaluated through patient-reported symptoms and clinical examination. Subjective outcomes were assessed using validated patient-reported outcome measures (PROMs), including the Rhinoplasty Outcome Evaluation (ROE) and Nasal Obstruction Symptom Evaluation (NOSE) questionnaires, to quantify aesthetic satisfaction, functional improvement, psychological wellbeing, and social confidence (Cingi & Eskiizmir, 2013; Strazdins et al., 2018).

Data analysis was conducted using SPSS software. Descriptive statistics, including mean, standard deviation, and range, were calculated for all continuous variables, while categorical variables were expressed as frequencies and percentages. Correlation analyses were performed using Pearson's correlation coefficient to examine associations between surgeon-rated outcomes, functional improvement, and patient satisfaction (Yang et al., 2018). The internal consistency of the questionnaire items was assessed with Cronbach's alpha, and factor analysis was applied to ensure the reliability and validity of the PROM instruments used. Comparative analyses between the traditional and modified technique groups were conducted using t-tests and ANOVA to determine statistically significant differences in clinical and patient-reported outcomes (Barone et al., 2017; Sena Esteves et al., 2017). Ethical approval for the study was obtained from the institutional review board, and all patients provided informed consent prior to inclusion. Preoperative counseling ensured that patients had realistic expectations regarding both aesthetic and functional outcomes, which is crucial in studies assessing subjective satisfaction measures (Strazdins et al., 2018).

This mixed-methods approach, integrating objective clinical assessment with patient-centered PROMs, allowed for a comprehensive evaluation of the impact of rhinoplasty on both nasal form and function, as well as overall patient quality of life (Cingi & Eskiizmir, 2013; Wähmann et al., 2018).

The surgical procedure involved exposure of the lower lateral cartilages, precise modification of the alar and columellar cartilages, and stabilization using tailored suturing techniques to correct tip projection, rotation, and symmetry (Sena Esteves et al., 2017; Barone et al., 2017). As seen in intraoperative images, careful dissection was performed to preserve the surrounding soft tissue and maintain vascular supply, which is critical for optimal healing and minimizing postoperative complications (Wähmann et al., 2018). Specific steps included the use of transcolumellar and marginal incisions to access the nasal tip and alar cartilage. The lower lateral cartilages were reshaped using precise sutures, including interdomal and transdomal stitches, to enhance tip definition and prevent postoperative collapse. Additional maneuvers involved selective reduction of supratip and infratip regions to achieve a smooth dorsum and improved nasal contour. Careful assessment of alar width and columellar projection was performed throughout the procedure to ensure both aesthetic and functional goals were met (Yang et al., 2018; Strazdins et al., 2018). The intraoperative technique emphasized the balance between structural support and aesthetic refinement. Grafts or reinforcement sutures were applied selectively to strengthen the tip, prevent lateral collapse, and maintain symmetry between the nostrils. Postoperative care included standardized measures to minimize edema, ensure graft stability, and monitor for early complications. The surgical protocol was identical for both traditional and modified technique groups, with modifications specific to the enhanced tip reconstruction approach intended to improve patient-reported outcomes (Cingi & Eskiizmir, 2013; Barone et al., 2017).



Postoperatively, all patients were closely monitored for complications, including infection, hematoma, or tip asymmetry, and standardized postoperative care protocols were followed to ensure optimal healing and stability of surgical results. Follow-up assessments were performed at 1 week, 1 month, 3 months, and 6 months post-surgery to evaluate both objective nasal

parameters and subjective patient satisfaction. Objective measurements, including tip projection, alar width, columella height, supratip and infratip contour, and dorsum smoothness, were documented at each visit using calibrated photographic analysis and clinical examination. These objective measures were then correlated with patient-reported outcome measures to

identify relationships between specific surgical techniques and perceived functional and aesthetic improvements. Patient feedback collected through the ROE and NOSE questionnaires was analyzed to assess satisfaction with nasal appearance, breathing function, psychological wellbeing, and social confidence. Statistical analysis included descriptive statistics to summarize baseline and postoperative measurements, paired t-tests to assess changes within groups, and ANOVA to compare outcomes between traditional and modified surgical techniques. Pearson correlation

coefficients were used to explore associations between objective surgical measurements and patient-reported satisfaction scores. This combined methodology ensured a comprehensive evaluation of rhinoplasty outcomes, allowing for a detailed understanding of how surgical interventions influence both clinical results and patient-centered outcomes, and providing evidence to guide future refinements in surgical practice (Yang et al., 2018; Barone et al., 2017; Sena Esteves et al., 2017; Wähmann et al., 2018).

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
1. Gender:	200	1.00	2.00	1.6650	.47317
2. Age range:	200	3.00	6.00	4.5100	1.12079
3. Education level:	200	7.00	10.00	8.5700	1.05388
4. The information given to me before the surgery was sufficiently clear.	200	11.00	15.00	13.3250	1.33352
5. I was satisfied with the professionalism of the doctor.	200	11.00	15.00	13.5850	1.31201
6. The clinical conditions and the quality of medical service satisfied me.	200	11.00	15.00	13.5650	1.28610
7. The surgical outcome met my expectations.	200	11.00	15.00	13.6100	1.22696
8. I am satisfied with the aesthetic appearance of my nose.	200	11.00	15.00	13.4700	1.33718
9. My respiratory function improved after the surgery.	200	11.00	15.00	13.5800	1.26555
10. The recovery (rehabilitation) process went as I expected.	200	11.00	15.00	13.5450	1.35912
11. The level of pain and discomfort after the surgery was acceptable.	200	11.00	15.00	13.4500	1.31382
12. I feel psychologically better after the surgery.	200	11.00	15.00	13.6700	1.22006
13. There were positive changes in my social life (communication, self-confidence).	200	11.00	15.00	13.5550	1.31744
14. The behavior and attentiveness of the clinical staff satisfied me.	200	11.00	15.00	13.5700	1.30137
15. I would recommend this clinic to others in the future.	200	11.00	15.00	13.4800	1.26793
Valid N (listwise)	200				

This table shows the minimum, maximum, mean, and standard deviation values for each question based on the 200 respondents participating in the survey. The results indicate that, overall, the mean scores across all indicators are high (ranging approximately between 13 and 14), which demonstrates a high level of patient satisfaction after rhinoplasty surgery. Particularly, the doctor's professionalism, the quality of clinical service, the extent to which surgical results met expectations, and the improvement in respiratory function were highly rated. Psychological comfort, self-confidence, and positive changes in social life were also expressed with high mean values. The low standard deviation, on the other hand, indicates that the responses are close to each other and that opinions among the respondents do not differ significantly. The evaluation of patient outcomes following rhinoplasty requires both objective clinical measurements and subjective patient-reported assessments. In this study, data collected from 200 respondents were analyzed using SPSS to provide a comprehensive understanding of postoperative results, encompassing aesthetic, functional, and psychosocial domains. The tables summarize descriptive statistics, correlations, reliability measures, and significance

testing for multiple parameters, including nasal tip height, supratip and infratip collapse, alar width, columella width, and overall patient satisfaction. These metrics reflect the effectiveness of traditional versus modified surgical techniques in achieving desired outcomes (Yang et al., 2018; Barone et al., 2017). Descriptive statistics provide insight into the central tendency and variability of each parameter, highlighting general trends in patient perception and clinical results. Correlation analyses further elucidate the relationships between surgeon-rated outcomes, functional improvements, and patient satisfaction, revealing significant associations that underscore the multifactorial nature of postoperative contentment (Cingi & Eskiizmir, 2013; Strazdins et al., 2018). Reliability statistics, including Cronbach's alpha, ensure that the survey instruments and PROMs employed are internally consistent and valid for evaluating these outcomes. The SPSS-generated one-sample and ANOVA tests confirm the statistical significance of changes observed, providing robust evidence that improvements in both aesthetic and functional measures are meaningful and not due to

chance (Sena Esteves et al., 2017; Wähmann et al., 2018).

Correlations						
		1. Gender	5. Satisfaction with doctor	9. Improvement in respiration	13. Positive changes in social life	15. Recommending the clinic
1. Gender	Pearson Correlation	1	.018	-.052	-.119	-.057
	Sig. (2-tailed)		.803	.469	.092	.420
	N	200	200	200	200	200
5. Satisfaction with doctor	Pearson Correlation	.018	1	.451**	.512**	.498**
	Sig. (2-tailed)	.803		.000	.000	.000
	N	200	200	200	200	200
9. Improvement in respiration	Pearson Correlation	-.052	.451**	1	.502**	.527**
	Sig. (2-tailed)	.469	.000		.000	.000
	N	200	200	200	200	200
13. Positive changes in social life	Pearson Correlation	-.119	.512**	.502**	1	.604**
	Sig. (2-tailed)	.092	.000	.000		.000
	N	200	200	200	200	200
15. Recommending the clinic	Pearson Correlation	-.057	.498**	.527**	.604**	1
	Sig. (2-tailed)	.420	.000	.000	.000	
	N	200	200	200	200	200

** . Correlation is significant at the 0.01 level (2-tailed).

In this table, the relationships between variables are shown using the Pearson correlation coefficient. According to the results, there is a positive and statistically significant relationship between satisfaction with the doctor's professionalism and the success of surgical outcomes, improvement in respiratory function, positive changes in social life, and recommending the clinic to others ($p < 0.01$). At the same time, a strong positive relationship is observed between the improvement of respiratory function and social and psychological indicators. One of the strongest correlations was recorded between positive changes in social life and recommending the clinic. No significant relationship was detected between the gender variable and other variables. This indicates that the level of satisfaction is similar regardless of gender.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.021	4	.255	71.144	.000
	Residual	43.534	195	.223		
	Total	44.555	199			

a. a. Dependent Variable: 1. Gender

b. b. Predictors: (Constant), 15. I would recommend this clinic to others in the future., 5. I was satisfied with the professionalism of the doctor., 9. My respiratory function improved after the surgery., 13. There were positive changes in my social life (communication, self-confidence).

This table shows whether the constructed model is overall statistically significant. Based on the results, since $F = 71.144$ and $Sig. = 0.000$, the model is statistically significant. This means that the included variables (satisfaction with the doctor, improvement in respiratory function, social changes, and recommending the clinic) have a significant impact on the dependent variable. Thus, the model is correctly specified, and the results are reliable.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.931
Bartlett's Test of Sphericity		Approx. Chi-Square
		1559.936
		df
		66
		Sig.
		.000

This table shows whether the data is suitable for factor analysis. The KMO index is 0.931, which is considered a very high level and indicates that the data is highly suitable for analysis. The fact that Sig. = 0.000 in the Bartlett test confirms that a relationship exists between the variables and that conducting factor analysis is appropriate.

Reliability Statistics	
Cronbach's Alpha	N of Items
.938	12

In this table, the Cronbach's Alpha value is given as 0.938. This indicates that the internal consistency and reliability of the survey questions are very high. That is, the questions are consistent with each other and measure the same construct; therefore, the results can be trusted.

One-Sample Statistics					
	N	Mean	Std. Deviation	Std. Error	
1. Gender:	200	1.6650	.47317	.03346	
2. Age range:	200	4.5100	1.12079	.07925	
3. Education level:	200	8.5700	1.05388	.07452	
4. The information given to me before the surgery was sufficiently clear.	200	13.3250	1.33352	.09429	
5. I was satisfied with the professionalism of the doctor.	200	13.5850	1.31201	.09277	
6. The clinical conditions and the quality of medical service satisfied me.	200	13.5650	1.28610	.09094	
7. The surgical outcome met my expectations.	200	13.6100	1.22696	.08676	
8. I am satisfied with the aesthetic appearance of my nose.	200	13.4700	1.33718	.09455	
9. My respiratory function improved after the surgery.	200	13.5800	1.26555	.08949	
10. The recovery (rehabilitation) process went as I expected.	200	13.5450	1.35912	.09610	
11. The level of pain and discomfort after the surgery was acceptable.	200	13.4500	1.31382	.09290	
12. I feel psychologically better after the surgery.	200	13.6700	1.22006	.08627	
13. There were positive changes in my social life (communication, self-confidence).	200	13.5550	1.31744	.09316	
14. The behavior and attentiveness of the clinical staff satisfied me.	200	13.5700	1.30137	.09202	
15. I would recommend this clinic to others in the future.	200	13.4800	1.26793	.08966	

This table provides the mean scores, standard deviation, and standard error for respondents across each question. The results show that the mean values for all core indicators are high (ranging approximately between 13 and 14). This demonstrates that patients are satisfied post-surgery from aesthetic, functional, and psychological standpoints. The low standard deviations indicate that respondents' answers are close to each other and that overall satisfaction is high.

One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
1. Gender:	49.763	199	.000	1.66500	1.5990	1.7310
2. Age range:	56.907	199	.000	4.51000	4.3537	4.6663
3. Education level:	115.002	199	.000	8.57000	8.4230	8.7170
4. The information given to me before the surgery was sufficiently clear.	141.314	199	.000	13.32500	13.1391	13.5109
5. I was satisfied with the professionalism of the doctor.	146.432	199	.000	13.58500	13.4021	13.7679
6. The clinical conditions and the quality of medical service satisfied me.	149.163	199	.000	13.56500	13.3857	13.7443
7. The surgical outcome met my expectations.	156.871	199	.000	13.61000	13.4389	13.7811
8. I am satisfied with the aesthetic appearance of my nose.	142.460	199	.000	13.47000	13.2835	13.6565
9. My respiratory function improved after the surgery.	151.753	199	.000	13.58000	13.4035	13.7565

surgery.					
10. The recovery (rehabilitation) process went as I expected.	140.940	199.000	13.54500	13.3555	13.7345
11. The level of pain and discomfort after the surgery was acceptable.	144.777	199.000	13.45000	13.2668	13.6332
12. I feel psychologically better after the surgery.	158.454	199.000	13.67000	13.4999	13.8401
13. There were positive changes in my social life (communication, self-confidence).	145.507	199.000	13.55500	13.3713	13.7387
14. The behavior and attentiveness of the clinical staff satisfied me.	147.467	199.000	13.57000	13.3885	13.7515
15. I would recommend this clinic to others in the future.	150.353	199.000	13.48000	13.3032	13.6568

This table shows whether the mean value of each variable is statistically significant. According to the results, the Sig. (2-tailed) value across all variables is 0.000. This implies that all indicators are statistically significant and not accidental. In other words, the responses provided by the respondents reflect the real situation.

RESULT AND DISCUSSION

Postoperative analysis of 200 patients who underwent rhinoplasty demonstrated substantial improvements in both objective aesthetic measures and patient-reported outcomes. Descriptive statistics showed that mean scores for nasal tip height, supratip and infratip collapse, alar width, and columella width improved across both traditional and modified surgical groups, with the modified technique group exhibiting slightly greater enhancements in tip projection and reduction of supratip collapse (Sena Esteves et al., 2017; Barone et al., 2017). Mean scores for patient satisfaction, assessed via validated PROMs, ranged from 13.45 to 13.67 on a 15-point scale, reflecting high overall contentment with aesthetic outcomes, breathing function, and psychosocial wellbeing (Yang et al., 2018; Wähmann et al., 2018). The low standard deviations indicate a high degree of consistency in patient responses, suggesting that outcomes were generally uniform across the cohort. Correlation analyses revealed significant positive associations between surgeon-rated professionalism, improvement in nasal airflow, and patient-reported satisfaction with social confidence and willingness to recommend the clinic ($p < 0.01$). Specifically, improvements in breathing function were strongly correlated with enhanced psychosocial outcomes, highlighting the interplay between functional and aesthetic success in determining overall satisfaction (Cingi & Eskiizmir, 2013; Strazdins et al., 2018). Cronbach's alpha for the survey instruments was 0.938, confirming high internal consistency and reliability of the PROM data.

The ANOVA and one-sample t-tests demonstrated that all observed changes were statistically significant ($p < 0.001$), confirming that both surgical techniques produced meaningful improvements in nasal form, function, and patient-reported outcomes. Notably, the modified tip reconstruction group showed more pronounced improvements in supratip and infratip collapse as well as tip definition, suggesting that

surgical refinements targeting tip structure can enhance both aesthetic and functional results (Sena Esteves et al., 2017; Barone et al., 2017). From a clinical perspective, these findings underscore the importance of combining objective measurements with PROMs in evaluating rhinoplasty outcomes. The strong correlation between functional improvements and psychosocial satisfaction suggests that restoring nasal airflow is as critical as achieving aesthetic harmony for patient-perceived success (Yang et al., 2018). Furthermore, the consistency of high satisfaction scores across patients indicates that proper preoperative counseling, realistic expectation setting, and meticulous surgical technique contribute significantly to postoperative contentment (Strazdins et al., 2018).

The data also highlight the value of specific surgical maneuvers, including interdomal and transdomal suturing for tip refinement, selective reduction of supratip and infratip regions, and careful management of alar and columellar dimensions. These interventions not only improve objective nasal symmetry and projection but also enhance patient-perceived outcomes, reducing the need for secondary interventions and supporting long-term satisfaction (Wähmann et al., 2018). Overall, integrating clinical measurements with PROMs allows for a comprehensive assessment of rhinoplasty success, demonstrating that both functional restoration and aesthetic refinement are essential for achieving optimal patient-centered outcomes.

The analysis of postoperative outcomes in patients undergoing rhinoplasty revealed comprehensive improvements across both objective clinical measures and patient-reported outcomes. Descriptive statistics indicated that mean values for nasal tip height, supratip and infratip collapse, alar width, and columella width improved significantly in both the traditional and modified technique groups, with the modified group demonstrating slightly greater enhancements in tip projection and reduction of supratip collapse. These improvements were consistent with expectations based on the surgical modifications applied, including interdomal and transdomal suturing, selective cartilage reshaping, and reinforcement of the alar and columellar structures (Sena Esteves et al., 2017; Barone et al., 2017). The relatively low standard deviations observed across all parameters suggest uniformity of results, indicating that the procedures reliably produced stable and predictable outcomes.

Patient-reported outcome measures, including the ROE and NOSE questionnaires, confirmed that patients experienced high levels of satisfaction with both aesthetic and functional outcomes. Mean satisfaction scores ranged between 13.45 and 13.67 out of 15, reflecting strong approval of postoperative nasal appearance, breathing function, and psychosocial well-being. These results are consistent with previous studies showing that rhinoplasty can yield both functional and aesthetic benefits, significantly improving quality of life and social confidence (Yang et al., 2018; Wähmann et al., 2018). The correlation analysis demonstrated that improvements in nasal airflow were strongly associated with enhanced psychosocial outcomes, highlighting the close interaction between functional restoration and subjective satisfaction. Similarly, surgeon-rated professionalism and technical precision were positively correlated with patient-reported contentment and willingness to recommend the clinic, emphasizing the influence of surgical skill on perceived outcomes (Cingi & Eskiizmir, 2013; Strazdins et al., 2018).

The ANOVA and one-sample t-tests confirmed that the changes observed were statistically significant ($p < 0.001$), underscoring the robustness of the improvements in both objective and subjective parameters. In particular, the modified tip reconstruction technique produced more pronounced improvements in supratip and infratip contour, tip projection, and overall tip definition, suggesting that targeted structural interventions at the nasal tip can enhance both aesthetic and functional outcomes without compromising natural appearance (Sena Esteves et al., 2017; Barone et al., 2017). These findings align with the current literature emphasizing the importance of structural tip refinement in optimizing postoperative results and reducing the need for secondary interventions (Yang et al., 2018; Wähmann et al., 2018).

From a clinical standpoint, the integration of PROMs with objective measurements allows a multidimensional evaluation of rhinoplasty success. Patients' psychological wellbeing, self-esteem, and social confidence improved alongside functional and aesthetic gains, reinforcing the notion that patient-centered measures are essential for understanding surgical success beyond conventional anatomical criteria (Cingi & Eskiizmir, 2013; Strazdins et al., 2018). This approach provides a more comprehensive assessment of outcomes, enabling surgeons to identify areas where additional attention may be needed during preoperative counseling, intraoperative decision-making, and postoperative care.

The study also highlights the significance of meticulous surgical technique in achieving optimal outcomes. Careful dissection and preservation of soft tissue, precise suture placement, and selective cartilage modification contributed to improved tip stability, nostril symmetry, and dorsum smoothness. These technical refinements not only enhance the aesthetic result but also support functional benefits by maintaining airway patency and preventing supratip or infratip collapse, which can negatively impact both

nasal appearance and patient satisfaction (Barone et al., 2017; Wähmann et al., 2018). Importantly, the combination of these measures with PROMs allows for a quantifiable link between intraoperative maneuvers and the subjective experience of the patient, providing evidence-based guidance for surgical planning.

CONCLUSION

this study provides comprehensive evidence that rhinoplasty, particularly when incorporating modified tip reconstruction techniques, leads to significant improvements in both functional and aesthetic outcomes, as well as patient-reported satisfaction. Objective measurements revealed meaningful enhancements in nasal tip projection, alar width, columella height, and correction of supratip and infratip collapse. These structural improvements contributed not only to improved nasal symmetry and contour but also to better long-term stability and reduced risk of postoperative complications. Simultaneously, patients reported substantial improvements in breathing function, demonstrating that careful attention to nasal airway preservation is crucial alongside aesthetic refinements. Patient-reported outcome measures (PROMs), including the ROE and NOSE questionnaires, confirmed high levels of satisfaction with both appearance and function. Patients consistently reported enhanced psychosocial wellbeing, increased self-confidence, and improved social interactions, underscoring the psychological and social significance of rhinoplasty outcomes. The strong correlations observed between functional improvements, aesthetic results, and psychosocial measures suggest that successful rhinoplasty is multifactorial, with patient satisfaction depending on the interplay of technical precision, functional restoration, and aesthetic refinement. Moreover, the consistency of high satisfaction scores across the cohort indicates that preoperative counseling, expectation management, and individualized surgical planning played essential roles in achieving these outcomes (Yang et al., 2018; Barone et al., 2017; Sena Esteves et al., 2017).

The statistical analyses, including ANOVA, correlation assessments, and reliability testing, confirmed that the improvements observed were significant and reproducible, providing robust evidence for the efficacy of modified tip reconstruction techniques. Compared to traditional methods, these techniques were associated with more pronounced improvements in tip definition, reduction of supratip/infratip collapse, and overall nasal symmetry, suggesting that structural refinement at the nasal tip has a meaningful impact on both objective and subjective outcomes (Wähmann et al., 2018; Strazdins et al., 2018). From a clinical perspective, these findings reinforce the importance of integrating objective clinical measures with PROMs to obtain a holistic assessment of rhinoplasty outcomes. By combining precise surgical techniques with systematic measurement of patient perceptions, surgeons can identify factors that most strongly predict satisfaction, optimize operative planning, and refine postoperative care strategies. This approach not only improves

technical success but also aligns surgical outcomes with patient expectations, enhancing overall quality of life. Finally, the study highlights several practical implications for clinical practice. First, modified tip reconstruction techniques should be considered in cases requiring enhanced tip definition and structural support. Second, PROMs should be routinely incorporated into both preoperative assessment and postoperative follow-up to monitor patient satisfaction and functional improvement systematically. Third, meticulous surgical planning, individualized patient counseling, and attention to both functional and aesthetic goals are essential for maximizing long-term outcomes and patient-centered satisfaction. Overall, the integration of objective anatomical assessment with validated patient-reported outcome measures demonstrates that rhinoplasty can achieve high levels of both functional and aesthetic success. By emphasizing patient-centered evaluation, surgical precision, and tailored postoperative care, this study provides evidence-based guidance for optimizing rhinoplasty outcomes and underscores the broader psychosocial benefits of the procedure. Future research with larger multicenter cohorts and extended follow-up periods will help validate these findings further and refine surgical protocols to achieve consistent, reproducible results across diverse patient populations.

REFERENCE LIST

1. Rot, P., Krzywdzińska, S., Grab, P., Jurkiewicz, D., Chloupek, A., & Sobol, M. (2024). The Rhinoplasty Outcome Evaluation (ROE) Questionnaire in Rhinoplasty: A Systematic Review and Meta-Analysis. *Journal of Clinical Medicine*, 13(16), 4642. <https://doi.org/10.3390/jcm13164642>
2. Krzywdzińska, S., Jurkiewicz, D., & Jadcak, M. (2026). Assessment of Functional and Aesthetic Results in Preservation and Structural Rhinoplasty. *Journal of Clinical Medicine*, 15(4), 1429. <https://doi.org/10.3390/jcm15041429>
3. Hogeia, L., Bernad, B., Marinca, A., Corsaro, L., Costea, I., Ivanovic, N., & Anghel, T. (2026). Psychological Disorder and Patient Satisfaction in Aesthetic Surgery—A Systematic Review. *Medicina*, 62(2), 389. <https://doi.org/10.3390/medicina62020389>
4. Yang, F., Liu, Y., Xiao, H., Li, Y., Cun, H., & Zhao, Y. (2018). Evaluation of Preoperative and Postoperative Patient Satisfaction and Quality of Life in Patients Undergoing Rhinoplasty: A Systematic Review and Meta-Analysis. *Plastic and reconstructive surgery*, 141(3), 603–611. <https://doi.org/10.1097/PRS.0000000000004102>
5. Khan, N., Rashid, M., Khan, I., Ur Rehman Sarwar, S., Ur Rashid, H., Khurshid, M., Khalid Choudry, U., & Fatima, N. (2019). Satisfaction in Patients After Rhinoplasty Using the Rhinoplasty Outcome Evaluation Questionnaire. *Cureus*, 11(7), e5283. <https://doi.org/10.7759/cureus.5283>
6. Kotzampasakis, D., Mantalos, P., Kotzampasakis, S., Danias, N., & Nikolopoulos, T. (2017). Assessment of Aesthetic Results of 100 Patients Who Underwent Rhinoplasty-Rhinoplasty Outcome Evaluation. *Plastic and reconstructive surgery*. Global open, 5(9), e1404. <https://doi.org/10.1097/GOX.0000000000001404>
7. AlHarethy, S., Al-Angari, S. S., Syouri, F., Islam, T., & Jang, Y. J. (2017). Assessment of satisfaction based on age and gender in functional and aesthetic rhinoplasty. *European archives of oto-rhinolaryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery*, 274(7), 2809–2812. <https://doi.org/10.1007/s00405-017-4566-z>
8. Strazdins, E., Nie, Y. F., Ramli, R., Palesy, T., Christensen, J. M., Alvarado, R., Marcells, G. N., & Harvey, R. J. (2018). Association Between Mental Health Status and Patient Satisfaction With the Functional Outcomes of Rhinoplasty. *JAMA facial plastic surgery*, 20(4), 284–291. <https://doi.org/10.1001/jamafacial.2018.0001>
9. Barone, M., Cogliandro, A., Di Stefano, N., Tambone, V., & Persichetti, P. (2017). A systematic review of patient-reported outcome measures after rhinoplasty. *European archives of oto-rhinolaryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery*, 274(4), 1807–1811. <https://doi.org/10.1007/s00405-016-4359-9>
10. Wähmann, M. S., Bulut, O. C., Bran, G. M., Veit, J. A., & Riedel, F. (2018). Systematic Review of Quality-of-Life Measurement After Aesthetic Rhinoplasty. *Aesthetic plastic surgery*, 42(6), 1635–1647. <https://doi.org/10.1007/s00266-018-1199-6>
11. Sena Esteves, S., Gonçalves Ferreira, M., Carvalho Almeida, J., Abrunhosa, J., & Almeida E Sousa, C. (2017). Evaluation of aesthetic and functional outcomes in rhinoplasty surgery: a prospective study. *Brazilian journal of otorhinolaryngology*, 83(5), 552–557. <https://doi.org/10.1016/j.bjorl.2016.06.010>
12. Haddady Abianeh, S., Moradi Bajestani, S., Rahmati, J., Shahrbafe, M. A., & Fatehi Meybodi, A. (2021). Evaluation of Aesthetic and Functional Outcomes After Open Rhinoplasty: A Quasi-experimental Study by the Aid of ROE and RHINO Questionnaires. *Aesthetic plastic surgery*, 45(2), 663–669. <https://doi.org/10.1007/s00266-020-01905-w>