ORIGINAL ARTICLE

Evaluation of quality of life after septorhinoplasty using Rhinoplasty Outcome Evaluation questionnaire

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Abstract

Background To assess satisfaction level of patients undergoing septorhinoplasty pre- and post-operatively using Rhinoplasty Outcome Evaluation (ROE) questionnaire.

Methods The present prospective study, after approval by Institutional Ethics Committee, was conducted in the Department of ENT, SMGS Hospital, from March 2021 to November 2022 on 83 patients who underwent septorhinoplasty. Demographic and clinical characteristics (age, gender, education, technique of surgery) of all participants were recorded. All patients were asked to answer the Rhinoplasty Outcome Evaluation (ROE) questionnaire 1 day prior to surgery. Postoperative ROE questionnaire was asked at the 6th month in ENT OPD by the same researcher.

Results In our study, the mean preoperative total ROE score was 32.17 ± 5.38, and the mean postoperative total ROE score was 87.11 ± 5.39, the difference being statistically significant ($p = 0.0039$). Higher post-operative satisfaction score (89.7 ± 5.64) was seen in patients aged more than 35 years, as compared to younger patients (78.4 ± 5.8). In our study, upon gender-wise comparison, there was more statistically significant satisfaction in male patients than female patients postoperatively ($p = 0.0022$). Better postoperative ROE score was seen in lower literacy group (88.9 ± 6.73) than higher literacy group (83.3 ± 5.63). However, both open and closed techniques showed statistically insignificant difference in postoperative ROE score ($p = 0.388$).

Conclusion Based on the Rhinoplasty Outcome Evaluation (ROE) questionnaire, our study showed that septorhinoplasty significantly improved quality of life in majority of our study subjects in terms of both aesthetic as well as functional parameters.

Keywords Rhinoplasty, ROE, Quality

Background

Quality of life can be defined as the perception of one's situation in life within the cultural and value system in which he lives, and in relation to one's objectives, expectations, standards, and concerns. Thus, it is a concept of a holistic image of wholeness, which can be attained by various aesthetic interventions [1].

As cosmetic surgeries like septorhinoplasty are usually elective and patient satisfaction is of utmost importance, therefore, evaluation based on qualitative parameters is being increasingly recognised [2].

Questionnaires which assess quality of life and self-image have become gold standard for septorhinoplasty as it not only standardises the evaluation of surgical outcomes but also guides regarding comparison of various surgical techniques and identifying patients who may not benefit from surgery [3].

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Saraf *et al. The Egyptian Journal of Otolaryngology*   (2023) 39:82

Page 2 of 5

The nose has central location in the face, and any defect in its shape affects personality development and body image; as such, septorhinoplasty is one of the most performed plastic surgeries according to the American Society of Plastic Surgeons, being done most commonly in young males and females [4].

The primary aim of septorhinoplasty is to improve patient's appearance; hence, patient selection is very important as difficulty in interpreting patient's expectations could lead to a lower post-operative satisfaction.

Although surgical outcome of septorhinoplasty can be accurately evaluated by anthropometric measurements and anatomical markers of facial measurements, one of the most important determinants, i.e., patient satisfaction and expectation is not included in them. Measuring patient satisfaction and expectation is not an easy task as there are no real standards available [5, 6].

The Rhinoplasty Outcome Evaluation (ROE) questionnaire is a quick, easy to perform, and a validated tool developed by Alsarraf R et al. (2000) [7], which can objectively analyse various qualitative variables involved in septorhinoplasty, such as psychological, social, and emotional aspects.

As the expectation and opinion regarding surgical outcome might differ between surgeon and patient, especially in a procedure like septorhinoplasty which impacts directly on patient satisfaction with own image and eventually self-esteem, we in this study aim to assess satisfaction level of patients undergoing septorhinoplasty pre- and post-operatively using the Rhinoplasty Outcome Evaluation (ROE) questionnaire.

Methods

The present prospective study, after approval by the Institutional Ethics Committee, was conducted in the Department of ENT, SMGS Hospital, from March 2021 to November 2022 on 83 patients who underwent septorhinoplasty. Written informed consent was taken from all subjects.

Inclusion criteria:

- Age > 18 years and < 60 years
- Giving consent to participate in study

Exclusion criteria:

- Patients with congenital nasal deformities
- Those requiring revision rhinoplasty
- Those requiring concurrent functional endoscopic sinus surgery or other nasal airway procedures
- Age less than 18 years or more than 60 years

Demographic and clinical characteristics (age, gender, education, technique of surgery) of all participants were recorded. All patients planned for septorhinoplasty procedure underwent detailed general physical/systemic/local ENT examination. All routine investigations including blood/radiological tests, required for general anaesthesia, were done.

All patients were asked to answer the Rhinoplasty Outcome Evaluation (ROE) questionnaire 1 day prior to surgery. ROE consists of 6 questions (Table 1)—5 questions regarding aesthetic aspects of surgery and one question regarding functional outcome of surgery. Each question was answered on a scale of 0 to 4, with 0 indicating the most negative response and 4 indicating most positive response. The patient's response to each question were summed up, divided by 24 and multiplied by 100, to get a ROE score varying between 0 and 100, with 0 representing minimum satisfaction and 100 implying most satisfaction.

Patients were followed up postoperatively at the 1st month, 3rd month, and 6th month. Postoperative ROE questionnaire was asked at the 6th month in ENT OPD by the same researcher.

All study data was entered in a Microsoft Excel Spread Sheet and analysed/compared using the Statistical Package for Social Sciences (SPSS) software (version 21 for windows). Appropriate statistical tests were used as advised by statistician (p value < 0.05 was accepted as the statistical significance limit).

Results

A total of 83 patients who underwent septorhinoplasty were included in our study. The mean age of presentation in our study was 32.13 ± 6.82 years. The age wise distribution is shown in Table 2.

Out of 83 patients, 44 were females (53.01%), and 39 (46.99%) were males. The mean age in males was 30.61 ± 3.99 years, and in females, it was 28.87 ± 4.15 years. The indication for surgery was aesthetic in 10 patients (12.04%), functional in 22 patients (26.5%), and combined (aesthetic + functional) in 51 patients (61.4%).

The mean preoperative total ROE score (Table 3) was 32.17 ± 5.38, and mean postoperative total ROE score was 87.11 ± 5.39, the difference being statistically significant ($p = 0.0039$). The mean preoperative ROE score for age groups less than 35 years (Table 4) was 33.1 ± 4.38, and it was 39.7 ± 5.11 in the age group more than or equal to 35 years (difference being statistically significant $p = 0.047$). Postoperatively, the mean ROE score for the age group less than 35 years was 78.4 ± 5.89, and it was 89.7 ± 5.64 for the age group more than or equal

Saraf *et al. The Egyptian Journal of Otolaryngology*   (2023) 39:82

Page 3 of 5

Table 1 Rhinoplasty Outcome Evaluation (ROE) questionnaire

1) How well do you like the appearance of your nose	Not at all (0) Somewhat (1) Moderately (2) Very much (3) Completely (4)
2) How well are you able to breathe through your nose	Not at all (0) Somewhat (1) Moderately (2) Very much (3) Completely (4)
3) How much do you feel your friends and loved ones like your nose	Not at all (0) Somewhat (1) Moderately (2) Very much (3) Completely (4)
4) Do you think your current nasal appearance limits your social or professional activities	Always (0) Usually (1) Sometimes (2) Rarely (3) Never (4)
5) How confident are you that your nasal appearance is the best that it can be	Not at all (0) Somewhat (1) Moderately (2) Very much (3) Completely (4)
6) Would you like to surgically alter the appearance or function of your nose	Definitely (0) Most likely (1) Possibly (2) Probably not (3) No (4)

Table 2 Age-wise distribution of patients

Age group	Number of patients
18–25	6 (7.2%)
26–35	35 (42.1%)
36–45	40 (48.2%)
46–60	2 (2.4%)

Table 3 Total mean pre-and post-operative ROE score

	Preoperative	Postoperative	*p*-value
Mean total ROE score	32.17 ± 5.38	87.11 ± 5.39	0.00039

Table 4 Age group-wise comparison of ROE score

	Age less than 35 years	Age more than or equal to 35 years	*p*-value
Preoperative ROE score	33.1 ± 4.38	39.7 ± 5.11	0.047
Postoperative ROE score	78.4 ± 5.89	89.7 ± 5.64	0.0019

Table 5 Gender-wise comparison of ROE score

	Males	Females	*p*-value
Preoperative ROE score	29.1 ± 4.55	31.8 ± 5.31	0.261
Postoperative ROE score	92.4 ± 7.37	83.3 ± 6.92	0.0022

to 35 years, the difference being statistically significant ($p = 0.0019$).

Upon gender-wise comparison (Table 5), the mean preoperative ROE score for males was 29.1 ± 4.55, and it was 31.8 ± 5.31 for females, the difference being statistically insignificant ($p = 0.261$). Postoperatively, the mean ROE score was 92.4 ± 7.37 in males and 83.3 ± 6.92 for females, the difference being statistically significant ($p = 0.0022$).

Out of 83 patients, 56 patients (67.5%) underwent open technique, and 27 patients (32.5%) underwent closed technique of septorhinoplasty. Upon surgical technique-wise comparison (Table 6), the mean preoperative ROE score for open technique was 31.1 ± 5.75, and it was 30.4 ± 5.11 for closed technique, the difference being statistically insignificant ($p = 0.973$). Postoperatively, the mean ROE score was 88.2 ± 5.44 in

Table 6 Surgical technique-wise comparison of ROE score

	Open technique	Closed technique	*p*-value
Preoperative ROE score	31.1 ± 5.75	30.4 ± 5.11	0.973
Postoperative ROE score	88.2 ± 5.44	86.7 ± 6.05	0.388

open technique, and it was 86.7 ± 6.05 for closed technique, the difference being statistically insignificant (*p* = 0.388).

We in our study defined patients who were educated below 8th grade as the low literacy group and those who had college degree and/or above as the high literacy group. Out of 83 patients, 22 patients (26.5%) were in the low literacy group, and 18 patients (21.7%) were in the high literacy group, the rest of the patients being educated above 8th grade but less than college graduation. Upon literacy-wise comparison, the mean preoperative ROE score for the low literacy group was 33.5 ± 5.14, and it was 34.1 ± 5.45 for the high literacy group, the difference being statistically insignificant (*p* = 0.892). Postoperatively, the mean ROE score was 88.9 ± 6.73 for the low literacy group, and it was 83.3 ± 5.63 for the high literacy group, the difference being statistically significant (*p* = 0.034).

Discussion

Rhinoplasty is a complex procedure, and the operating surgeon must not only be well-versed with the underlying anatomy but also have the capability to perform a nasofacial analysis to formulate the operative plan and perform techniques that manipulate the bone, cartilage, and soft tissue [8].

Patient satisfaction is the most important indicator of success in cosmetic surgeries like septorhinoplasty, thus making the use of quantitative tools to assess the surgical outcome very crucial.

The Rhinoplasty Outcome Evaluation (ROE) questionnaire considers various factors which influence patient satisfaction, such as physical factors like nasal shape, emotional factors like degree of confidence, desire to change appearance, and social factors like family/social acceptance [9].

In our study, the mean preoperative total ROE score (Table 3) was 32.17 ± 5.38, and the mean postoperative total ROE score was 87.11 ± 5.39, the difference being statistically significant (*p* < 0.05). Thus, there was an improvement in ROE score by about 54.9 points, implying a high index of satisfaction in our patients. This is comparable to studies conducted by Arima et al. [10] and Cingi C and Eskiizmir G [11], who reported improvements in ROE score by 50.5 and 56.3 points respectively. However, studies done by Meninguad et al. (2008) [12] and Bulut OC et al. (2015) [13] showed improvements by 30.4 and 21.7 points only, respectively.

Out of 83 patients, 41 patients were below or equal to the age of 35 years, and 42 patients were above the age of 35 years. Between these two age groups (Table 4), there was statistically more significant satisfaction (*p* < 0.05) with surgical outcome in patients above 35 years than those patients who were less than or equal to 35 years. This finding was comparable to studies conducted by Litner JA et al. (2008) [14] and Gunel C et al. (2015 [15]. The reason for this difference could be due to the fact that as a person ages, person gets more accepting of how they look and adapt well to their new facial appearance, while younger patients have greater expectations due to greater need for social acceptance and being more negatively affected by the unrealistic demands to hide their facial imperfections before social media. Hence, we need to counsel and guide younger patients in a more detailed manner so as to get better postoperative surgical satisfaction.

In our study, upon gender-wise comparison (Table 5), there was more statistically significant satisfaction in male patients than female patients (*p* < 0.05). This finding was consistent with studies conducted by Bilgin E et al. (2020) [16]. However, Khansa I et al. (2015) [17] reported more satisfaction in females, while Sozen et al. (2017) [18] showed in their study that there was no difference between males and female patients in terms of surgical outcome satisfaction. The reason for this finding could be due to females being more concerned regarding their facial appearance, as compared to male patients.

In our study, there was no statistically significant difference (Table 6) in postoperative patient satisfaction on the basis of surgical technique used (*p* = 0.388). This was consistent with study conducted by Esteves SS et al. (2016) [2]. However, there was statistically more significant satisfaction (Table 7) in the lower literacy group of patients than

Table 7 Literacy-wise comparison of ROE score

	Low literacy group	High literacy group	*p*-value
Preoperative ROE score	33.5 ± 5.14	34.1 ± 5.45	0.892
Postoperative ROE score	88.9 ± 6.73	83.3 ± 5.63	0.034

Saraf *et al. The Egyptian Journal of Otolaryngology*   (2023) 39:82

Page 5 of 5

the higher literacy group ($p < 0.05$). This finding was comparable to study conducted by Khan N et al. (2019) [19]. The reason for this finding could be due to the fact that patients with lower literacy had lower expectations regarding the extent their facial appearance should change after surgery, while higher literacy patients have less satisfaction as they keep on trying to gather more and more knowledge regarding how outcome of surgery should have been.

Conclusion

Based on the Rhinoplasty Outcome Evaluation (ROE) questionnaire, our study showed that septorhinoplasty significantly improved quality of life in the majority of our study subjects in terms of both aesthetic as well as functional parameters. Various factors like older age group, lower literacy, and male gender are more likely to have better satisfaction with postoperative surgical outcome, while the type of surgical technique used has no impact on patient's quality of life. There are many other uncontrolled factors like demographic criteria/education of relatives and friends, which need to be studied as well; thus, further studies are required to find the effect of such factors on score values.

Authors' contributions
AS made contributions in the data collection and design of manuscript. NG made contributions in the interpretation of data. MM and PK made contributions in the data analysis. All authors read and gave approval to the final version of submitted manuscript.

Availability of data and materials
Available with corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The study was conducted after approval by Institutional Ethics Committee of GMC Jammu. Written informed consent was taken from all subjects or their legal guardian in case of age of patient being less than 18 years. No animals were used in the study.

Consent for publication
Written informed consent to publish patient's clinical details was obtained from all subjects or their legal guardian in case of subject under 18 years.

Competing interests
The authors declare they have no competing interests.

References

1. The Whoqol Group (1998) The World Health organization Quality of Life Assessment (WHO-QOL): development and general psychometric properties. Soc Sci Med 46(12):1569–82
2. Esteves SS, Ferreira MG, Almeida JC, et al. (2016) Evaluation of aesthetic and functional outcomes in rhinoplasty surgery: a prospective study. Braz J Otorhinolaryngol 83(5):552–7. https://doi.org/10.1016/j.bjorl.2016.06.010
3. Ching S, Thoma A, McCabe RE et al (2003) Measuring outcomes in aesthetic surgery: a comprehensive review of the literature. Plast Reconstr Surg 111:469–480
4. Picavet VA, Prokopakis EP, Gabriels L et al (2011) High prevalence of body dysmorphic disorder symptoms in patients seeking rhinoplasty. Plast Reconstr Surg 128:509–517
5. Okur E, Yildirim I, Ayodgan B et al (2004) Outcome of surgery for crooked nose: an objective method of evaluation. Aesthetic Plast Surg 28:203–207
6. Nouraei SA, Pulido MA, Saleh HA (2009) Impact of rhinoplasty on objective measurement and psychophysical appreciation of facial symmetry. Arch Facial Plast Surg 11:198–202
7. Alsarraf R (2000) Outcomes research in facial plastic surgery: a review and new directions. Aesthetic Plast Surg 24(3):192–197
8. Rohrich RJ, Ahmad J (2011) Rhinoplasty. Plast Reconstr Surg 128:49–73
9. Izu SC, Kosugi EM, Brandao KV et al (2012) Normal values for the Rhinoplasty Outcome Evaluation (ROE) questionnaire. Braz J Otorhinolaryngol 78(4):76–79
10. Arima LM, Velasco LC, Tiago RS (2012) Influence of age on rhinoplasty outcomes evaluation: a preliminary study. Aesth Plast Surg 36:248–253
11. Cingi C, Eskiizmir G (2013) Deviated nose attenuates the degree of patient satisfaction and quality of life in rhinoplasty: a prospective controlled study. Clin Otolaryngol 38:136–141
12. Meningaud JP, Lantieri L, Bertrand JC (2008) Rhinoplasty: an outcome research. Plast Reconstr Surg 121:251–257
13. Bulut OC, Wallner F, Plinkert PK et al (2015) Quality of life after septorhinoplasty measured with the Functional Rhinoplasty Outcome Inventory 17. Rhinology 53:54–58
14. Litner JA, Rotenberg BW, Dennis M et al (2008) Impact of cosmetic facial surgery on satisfaction with appearance and quality of life. Arch Facial Plast surg 10:79–83
15. Gubel C, Omurlu IK (2015) The effect of rhinoplasty on psychosocial distress level and quality of life. Eur Arch Oto Rhino Laryngol 272:1931–5
16. Bilgin E, Say M, Baklaci D (2020) Assessment of patient satisfaction with primary septorhinoplasty using the rhinoplasty Outcome Evaluation Questionnaire. Cureus 12(11):e11777
17. Khansa I, Khansa L, Pearson GD (2015) Patient satisfaction after rhinoplasty: a social media analysis. Aesth Surg J 10:1–5
18. Sozen T, Cabbarzade C, Tahir E et al (2017) Factors determining patient satisfaction in rhinoplasty: analysis of 506 cases with rhinoplasty outcome evaluation. Acta Medica 48:1–5
19. Khan N, Rashid M, Khan I et al (2017) Satisfaction in patients after rhinoplasty using the Rhinoplasty Outcome Evaluation Questionnaire. Cureus 11(7):e5283

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