

Validity and Reliability of the Persian Version of the Rhinoplasty Outcomes Evaluation (ROE) Questionnaire

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Article Info

Article Note:

Received: November 2023

Accepted: December 2023

Publish Online: December 2023

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Keywords:

Rhinoplasty outcomes evaluation;

Questionnaires;

Validity;

Reliability.

Abstract

Background: Rhinoplasty outcomes evaluation (ROE) is a type of quality-of-life questionnaire. The ROE questionnaire, originally developed in English, has been translated into several languages.

Aim: This study focuses on assessing the reliability and validity of the Persian version of the questionnaire.

Methods: The study utilized a cross-sectional descriptive-analytical method to validate the Persian version of the rhinoplasty outcomes evaluation (ROE) questionnaire. The translation process involved two independent translators. The Persian version was then translated back into English and sent to the original designers of the questionnaire for permission. The content validity of the questionnaire was assessed by a group of experts, and the content validity ratio (CVR) and content validity index (CVI) were calculated. To assess reliability, test-retest, and Cronbach's alpha coefficient were used.

Results: The questionnaire demonstrated good reliability, with a Cronbach's alpha coefficient of 0.76, indicating internal consistency. The inter-item correlation (IIC) of the current questionnaire was equal to 0.727. The CVR of all questions was higher than the standard CVR for 10 experts, that is 0.62, except for question number two, which had a CVR of 0.564.

Conclusion: The research effectively confirmed the reliability and validity of the ROE questionnaire version in evaluating contentment after rhinoplasty procedures. This questionnaire now serves as an accurate tool specifically designed for assessing satisfaction, among individuals, in Iran.

Conflicts of Interest: The Authors declare no conflicts of interest.

Please cite this article as: Jahandideh H, Javadinejad K, Roomiani M. Validity and Reliability of the Persian Version of the Rhinoplasty Outcomes Evaluation (ROE) Questionnaire. J Otorhinolaryngol Facial Plast Surg 2023;9(1):1-6. <https://doi.org/10.22037/orlfps.v9i1.44348>

Introduction

In recent decades, there has been a growing interest in the evaluation of surgical outcomes in various medical specialties (1). Concerning facial plastic surgery, the study of patient satisfaction represents an underdeveloped area, with few validated instruments to evaluate the objective and subjective results of the procedures. An exception to this rule is the work published by Alsarraf, in 2000, in which the author proposed four questionnaires to evaluate the results of facial aesthetic surgeries,

transforming subjective patient data into quantitative data. Thus, these questionnaires make it possible to objectively assess the final satisfaction of the surgical procedure (2). Rhinoplasty outcomes evaluation (ROE) was one of these tools which is a type of quality-of-life questionnaire. Assessing quality of life is crucial in rhinoplasty because it goes beyond just the physical changes to the nose. Rhinoplasty can have a significant impact on a person's overall well-being and self-perception. By using questionnaires to assess quality of life,

surgeons can gain a better understanding of the psychological and emotional effects of the surgery on their patients. This information can help guide post-operative care and support, ensuring that patients receive the necessary resources and interventions to optimize their recovery and overall satisfaction with the surgery (3). Patients who undergo rhytidoplasty may experience levels of satisfaction compared to facial aesthetic procedures. This is mainly due, to differences in expectations between the patient and the surgeon (4). It highlights the importance of understanding the patient's expectations before surgery to achieve outcomes. The assessment of satisfaction in rhytidoplasty considers factors that can influence it. These factors include aspects like nasal shape, emotional elements such as confidence levels and desire for appearance change, and social factors like family and social acceptance.

To evaluate this a questionnaire called ROE has been developed, consisting of six questions that cover each factor (emotional and social) related to patient satisfaction. Moreover, the ROE questionnaire is user-friendly and provides an evaluation of rhinoplasty-related patient satisfaction. (3, 5, 6). To ensure its suitability for use in populations the ROE questionnaire has been translated into languages apart from English (4, 6, 7). These translations include Brazilian Portuguese, Arabic, and Turkish. Validation is a step-in research to confirm that a questionnaire accurately measures what it intends to measure and is suitable for use, in a population. In our case, we translated the ROE questionnaire into Persian, which is spoken in Iran.

Following the translation process, we conducted validation procedures to assess both the reliability and validity of this translated questionnaire.

Methods

Study design and population

The research population in this cross-sectional descriptive-analytical study includes all the cases required for rhinoplasty surgery that were referred to Firouzgar Hospital in Tehran in 2019. The total number of patients who met the inclusion criteria and entered the study was 87 patients using the convenience sampling method. We included all patients who underwent rhinoplasty at Firouzgar Hospital in the patient group. For the control group, we selected patients who were referred to the otolaryngology clinic of Firouzgar Hospital but did not wish to undergo rhinoplasty or had no indications, for it. Patients who did not respond again or expressed dissatisfaction were excluded from the study. Before commencing the study, we obtained permission from the ethics committee of Iran University of Medical Sciences, coordinated with a research assistant from Firouzgar Hospital's otolaryngology department. We explained the study objectives and process to the participants, and obtained their written consent. Participants had the freedom to withdraw from participating in this research at any stage for any reason or even, without providing a reason.

ROE questionnaire

The ROE questionnaire has six questions, each with five answer options, graded from zero to four. Therefore, the score of the questionnaire may vary between zero and 24. For ease of understanding, the obtained score should be divided by 24 and multiplied by 100, which results in a score between zero and 100, and the higher the score, the greater the patient's satisfaction with the nose. These questionnaires were implemented by two of the authors in two different groups: the rhinoplasty group, consisting of patients who were waiting for rhinoplasty or rhinoplasty surgery. and the control group, consisting of healthy volunteers who did not want or did not indicate rhinoplasty or rhytidoplasty. To evaluate test-retest reliability, the cases completed the Persian ROE another time, 14 days following the initial assessment; this period was chosen to eliminate

recall bias, however, no considerable clinical changes occurred in the examined results.

Translation

Translation of the original version of ROE to Persian was performed with standard translation and reverse-translation methods. The translation of the questionnaire was done by the questionnaire designer in a forward-backwards manner. It should be noted that with the permission of the questionnaire designer, the translation was used in the agreement. For this purpose, in the first step, two translators independently translated this questionnaire into Persian. After matching these two translations and preparing a single version, the Persian version was translated into English and sent to the main designers of the questionnaire to obtain study permission. In the next step, the Persian version of the questionnaire was given to a group of experts to check the content validity of the questionnaire, and after obtaining their opinions, the content validity ratio (CVR) and content validity index (CVI) were calculated. Also, if necessary, experts' opinions were applied to the questionnaire to match the questionnaire as much as possible with the Iranian culture.

Statistical analysis

Once the questionnaires were completed, we inputted the data into software called SPSS version 26 for analysis. We reported data, as percentages and frequencies while quantitative data was presented as mean $\pm$ standard deviation (SD). To examine the relationship between variables we utilized the square test. For comparing means between two groups, we employed the t-test. For comparing means among than two groups we used the ANOVA test. In cases where the data did not follow a distribution, we resorted to parametric equivalents of these tests.

We assessed the reliability of the questionnaire by conducting a test analysis and calculating the Cronbach alpha coefficient. Cronbach's alpha is a measure that evaluates questionnaire reliability when it is designed in a Likert scale

format with response options. A value above 0.7 indicates reliability for the questionnaire.

To ensure content validity we employed two measures; content validity ratio (CVR) and content validity index (CVI). The relative coefficient of CVR was used to assess content validity. Convergence validity was examined using Spearman's formula, which measures the correlation, between two variables. Additionally, we conducted exploratory factor analysis using the SPSS software Dimension Reduction section. Throughout our analysis, we considered a significance level of 0.05.

Results

Demographic variables

In this study, a cross-sectional descriptive-analytical method was conducted to determine the reliability and validity of the Persian version of the ROE questionnaire. Eighty-seven patients participated in the study by convenience sampling method. The mean age of the participants was 21.53 ± 4.03 years, while women were older but not significant (21.71 ± 4.07 vs. 19.88 ± 3.51). The number of women in the present study was almost 8 times higher than men, also most of the patients were single and their education level was below diploma or diploma (Table 1).

Table 1. Frequency distribution of demographic characteristics in patients

Variable	Number (%)
Gender	
Male	9 (10.3%)
Female	78 (89.7%)
Educational level	
Below diploma	41 (47.2%)
Diploma and postgraduate	25 (28.75%)
Bachelor and higher	21 (24.13%)
Marital state	
Single	77 (88.51%)
Married	10 (11.49%)

There was no significant difference between the patient and control groups regarding age and sex.

Reliability

The questionnaire's Cronbach's alpha coefficient was determined to be 0.727, which is higher, than the value of 0.7. This indicates that the questionnaire shows consistency. Cronbach's alpha is a measure used to assess the reliability of a questionnaire or scale in evaluating a concept. Even if one question was removed from the questionnaire the Cronbach's alpha value still remained satisfactory ranging

from 0.63 to 0.76. This suggests that the remaining questions effectively measure the concept without the deleted question. It is also important to note that all items total correlation coefficients were significant ranging from 0.27 to 0.65 indicating a relationship between each item, in the questionnaire and the concept being measured. (Table 2).

Table 2. Internal correlation indicators of questionnaire questions

ROE question	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	9.05	9.91	0.648	0.555	0.649
Q2	7.36	9.93	0.277	0.103	0.765
Q3	8.68	10.37	0.486	0.364	0.686
Q4	7.34	8.90	0.493	0.248	0.683
Q5	9.32	9.05	0.655	0.551	0.631
Q6	10	11.27	0.363	0.209	0.716

Validity

According to Table 3, the CVR of all questions was higher than the standard CVR for 10 experts, that is 0.62, except for question number two, which had a CVR of 0.564. The CVI of all questions except question two was higher than 0.8, the average CVI of all questions was equal to 0.8, which is higher than 0.79 and indicates sufficient content validity of this questionnaire.

Table 3. Content validity index and content validity ratio

ROE question	CVR ¹ N=10	CVI ² N=10
Q1	0.71	0.8
Q2	0.56	0.6
Q3	0.75	0.8
Q4	0.68	0.8
Q5	0.81	0.9
Q6	0.73	0.9

¹ content validity index

² content validity ratio

Analytical analysis

The average overall score of the patients who underwent rhinoplasty was significantly lower

than the control group (43.15±15.32 vs. 57.24±16.03, p-value<0.05). The mean overall score of ROE in people the first time completing the questionnaire (43.15±15.32) and two weeks later (41.58±15.60) were similar and there was no statistically significant difference.

The average overall score of men (42.59±16.76) and women (43.22±15.27) referred for surgery was similar and statistically had no significant difference.

The inter-item correlation (IIC) of the current questionnaire was equal to 0.727 (p-value<0.05).

This finding indicates the appropriate internal correlation of the questionnaire components. The mean overall score of people was not statistically correlated with age and education level (Table 4).

Table 4. Correlation of the overall score of the ROE questionnaire with age and level of education

Variable	Spearman	
	Correlation With ROE	p-value
Age	0.124	0.542
Educational level	-0.229	0.4

Discussion

In our research we found that the Persian version of the ROE questionnaire showed reliability, with a Cronbach's alpha value of 0.727. The IIC value for this questionnaire was also calculated as 0.727 (p value<0.05) indicating a correlation between its components. Moreover, all questions had a CVR than CVR of 0.62 for 10 experts except for question number two which had a CVR of 0.564. Additionally, the CVI values for all questions except question two exceeded 0.8. The average CVI for all questions was 0.8 surpassing the required threshold of 0.79 and indicating content validity for this questionnaire. Furthermore, each question exhibited a positive correlation coefficient with the questionnaire; question two had a coefficient of 0.277 while question five had a maximum coefficient of 0.655.

Notably removing any question (except question number two) resulted in a Cronbach's alpha coefficient than that of the questionnaire. This suggests a correlation among the questions, within this questionnaire. In our study, question number two had a low item-to-total correlation coefficient and Cronbach's alpha coefficient was also high if it was removed. The same results were also observed in the Arabic translation of the questionnaire. Based on the analysis of the designers of the Arabic version, the reason is that the second question is only one question that deals with the function of the nose and most of the patients had completely aesthetic concerns (8). However, even if the main goal is purely aesthetic, attention should be paid to obstructive elements during rhinoplasty

because the presence of respiratory disorders and obstructive complications after surgery can have a detrimental effect on daily activities, sleep, and even the patient's facial expression.

In our study, gender, age, and educational level did not affect postoperative satisfaction scores using ROE. The average overall score of ROE in people at the first time of completing the questionnaire (43.15±15.32) and two weeks later (41.58±15.60) were similar and statistically had no significant difference, which indicates the reproducibility of the Persian version of the ROE questionnaire. These results are consistent with previous studies (9,11).

Izu et al. introduced a cut-off point of 12 of 24 or 50% for ROE to be used as a surgical outcome evaluation tool and to help predict outcomes (12). In our study, the average overall score of ROE in people at the first time of completing the questionnaire was 43.15±15.32 and after surgery, it was 68.48±12.49, which has a statistically significant difference (p-value<0.05). Patients reported a score lower than this cut point before surgery and higher than 50% after surgery. This shows the high satisfaction of patients with the result of surgery.

Other studies have used ROE to show the results of rhinoplasty and its high impact on quality of life and concluded that in long-term follow-up, patients' satisfaction with rhinoplasty increases. For this reason, follow-up is important to help evaluate long-term patient outcomes and satisfaction (15-13). Lack of long-term follow-up is one of the limitations of this study. However, the main purpose of this study was to test the validity and reliability of the Persian version of the ROE in Iran, and we did not focus on evaluating the quality of life after rhinoplasty. Another limitation is the relatively small sample size. Although there is no specific rule for calculating the sample size in studies assessing the validity and reliability of questionnaires, conducting a study with a

higher sample size can bring more convincing results.

Conclusion

According to this study, the Persian version of ROE showed good reliability and validity, and its results are comparable with ROE questionnaires that have been translated, adapted, and published in the literature, as well as the original ROE. Therefore, this tool can be used to evaluate the results of rhinoplasty surgery and many applications can be imagined for it.

Acknowledgments

Not declared.

Conflicts of Interest

The authors declare no conflicts of interest.

Financial Support

The authors declare there is no funding support for this study.

Ethics

IR.IUMS.FMD.REC.1399.849

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