

## Original Article

# Evidence for the reliability and validity of the Turkish version of the Utrecht questionnaire for outcome assessment in aesthetic rhinoplasty (T-OAR)

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**Abstract:** Background: The current study aimed to translate the Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty (OAR) into the Turkish language, then validate the new version (T-OAR) for use in Turkish patients. Methods: Thirty-five cases that knew how to write and read in the Turkish language, undergoing primary RP, were included in the study. Seventy-four healthy volunteer cases that did not need functional or aesthetical RP were included in the control group. Statistical analysis was performed to assess internal consistency, test-retest reliability, discriminant validity, and responsiveness. Results: VAS was used in the study group. There was a recovery on the nasal view in the postoperative period ( $8.8 \pm 0.84$ ), compared with the preoperative period ( $2.6 \pm 1.2$ ) ( $p=0.0001$ ). Scores of E1-E5 questions and total T-OAR scores in the study group were higher than those of the control group (all  $p$  values were  $< 0.05$ ). Scores of E1-E5 questions and total T-OAR scores were lower in the postoperative period than those in the preoperative period in the study group (all  $p$  scores were  $< 0.05$ ). Significant differences were not found in E1-E5 scores and total T-OAR scores (all  $p$  values were  $> 0.05$ ). The internal consistency of T-OAR was high. Cronbach's  $\alpha$  value was 0.928 in the preoperative period and 0.834 in the postoperative period. Conclusion: The T-OAR questionnaire is a valid and reliable questionnaire, evaluating body appearance and discomfort associated with nasal appearance in Turkish patients.

**Keywords:** Quality of life, patient reported outcome measure, post-operative, statistics

## Introduction

Rhinoplasty (RP) is one of the most common facial plastic surgical practices applied for aesthetic and functional purposes [1]. There are many published studies related to RP. These studies have focused on better surgical techniques, the use of surgical instruments, experience of surgeons, management of complications, and causes of revision rhinoplasty [2-4].

RP procedures and measurement of surgical outcomes through patient satisfaction and quality of life scores have recently become popular [5, 6]. Levels of patient postoperative satisfaction in RP operations are lower than those in other facial plastic surgeries [7, 8]. Several factors may affect patient satisfaction, including patient cultural features, levels of education, social environment, and expectations from the operation [8, 9]. Often, the surgeon thinks that he/she performed a successful

operation, but the operation may not meet the high expectations of a patient (and vice versa). Therefore, these differences need to be preoperatively revealed. Pre-operative expectations of the patients should be examined. If expectations cannot be met, the surgeon should share this information with the patient [10]. Cases involving body dysmorphic disorder should be determined before the operation. Profit cannot be derived from these cases and the level of postoperative satisfaction is often not acceptable in these cases [11].

It has been recommended that questionnaires evaluating patient satisfaction be used in the evaluation of RP outcomes [10, 11]. Questionnaires concerning quality of life (QOL) are appropriate tools enabling quantitative evaluation of subjective results, such as patient satisfaction and surgeon success. There are available questionnaires, including the Short Form-36, which evaluates overall QOL. Surgery-specific ques-

tionnaires are also available, enabling results to be evaluated more accurately. It might be difficult to analyze motivation and expectations of a patient in detail during short outpatient clinic periods. Thus, questionnaires should be designed in a way that they could be carried out in a short time. Moreover, short questionnaires have been shown to be effective and valuable in evaluating RP results, according to previous studies [2-5, 12].

Lohuis et al. [13] designed a short questionnaire for cases in which RP will be performed for aesthetic purposes. This questionnaire (The Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty (OAR)) is easily applied and conducted in a short time, consisting of two parts. The first part consists of 5 questions evaluating body appearance related to the nasal view. The second part consists of visual analogue scale scores (VAS). The original version of this questionnaire was translated into various languages through validation studies (German and Portuguese). Its cultural adaptation was provided. It is not good for a questionnaire to be translated solely to be used in different languages. Validation and cultural adaptation studies need to be carried out [10], as well. Existing questionnaires should be carefully examined, comparing the data obtained from new questionnaires developed through existing questionnaires. The OAR questionnaire was translated into Turkish. The Turkish version (T-OAR) of the OAR questionnaire was developed for use in the Turkish community.

### Methods

The current non-randomized prospective clinical study was carried out in the Department of Otorhinolaryngology. The study was conducted in accordance with the Principles of the Declaration of Helsinki and Guidelines for Good Clinical Practices. The study was approved by the Board of Ethics for Clinical Research of the same University (Board of Ethics decision no: 2018/26 date: 26.06.2018). Written informed consent was obtained from all patients. First step of the present study was the application for authorization to the original author.

#### *Translation and cultural adaptation phase*

The Turkish version of the Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty (T-OAR) is a forward- and backward-

translated version of the OAR. Translation and cultural adaptation of the OAR were carried out in accordance with the criteria of Guillemin et al. [14]. The original English version of the questionnaire was translated into Turkish by two native Turkish translators with fluency in English. These two translations were then compared. A mutual agreement was reached concerning a common translation. This final translation was then translated into English from Turkish by two different translators. These two translations were compared with each other and a final translation was formed. This translation was compared with the original version and differences were corrected. The questionnaire was filled out by 10 healthy volunteers to control the intelligibility of the questionnaire in the cultural adaptation phase. The questionnaire was found to be intelligible (**Appendix 1**).

T-AOR questionnaires basically consist of two parts. The first part of the questionnaire consists of five questions. The first part includes patient ideas concerning body appearance related to nasal view and quality of life. The patients give a point between one and five for every question (1 is the lowest and 5 is the highest). The first part of the questionnaire is measured. The lowest point total is 5 and the highest point total is 25. The third and fourth questions (E3 and E4) were designed as “tricky” questions, suggesting discomfort in body perception or body dysmorphic disorder. The second part of the questionnaire consists of the evaluation of the nasal view of the cases using VAS (1 means very ugly; 10 means very nice).

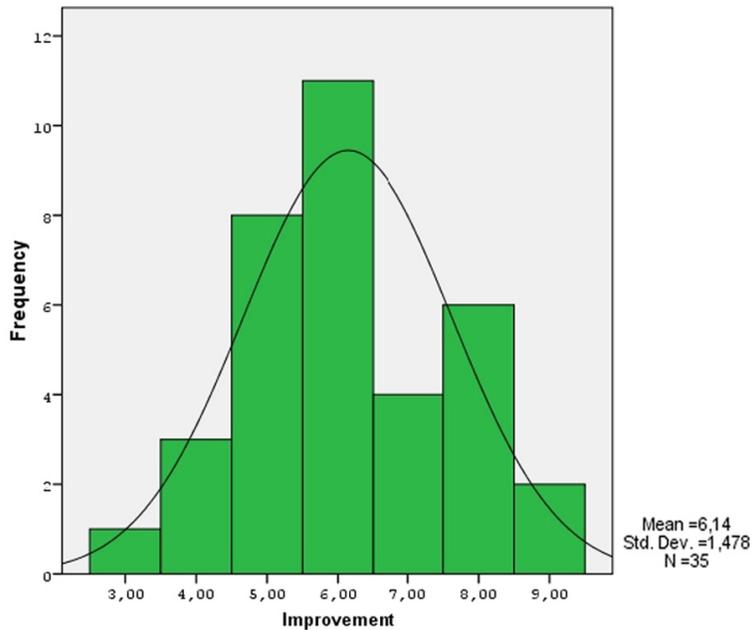
#### *Calculation of sample size*

Sample size was calculated based on the predictive formula for sample size for cross-sectional studies [15]. The number of cases included into each group was determined through 5% margin of error, 80% power, and 0.70 standard effect size. Results suggested that it was necessary to include at least 32 cases in each group.

#### *Participants*

Thirty-five patients that knew how to write and read in the Turkish language, undergoing primary RP (25 males and 10 females; mean age was  $25.3 \pm 7.3$  years, the range was 19-48 years), were included in the study. Exclusion criteria: Patients with congenital maxillofacial

## Turkish version of the OAR



**Figure 1.** Improvement of VAS in Turkish patients after rhinoplasty.

deformities; Patients that had undergone RP and septoplasty operations; Patients that did not know how to read or write in the Turkish language; Patients that did not want to participate in the study.

Seventy-four healthy volunteer cases that did not need functional or aesthetical RP (33 females and 41 males; mean age was  $24.6 \pm 3.9$  years, the range was 18-47 years) were included in the control group. Hospital personnel and university students were mainly included in the control group.

### Data collection

T-OAR questionnaires were completed by participants during three visits. T-OAR questionnaires were filled out by both the study group and the control group during the first visit. T-OAR questionnaires were filled out only by the cases in the study group in the second and third visits. T-OAR questionnaires were filled out by the study group before the operation and two weeks after the first examination during the second visit. T-OAR questionnaires were filled out by the study group in the 3<sup>rd</sup> postoperative month during the third visit.

### Statistical analysis

Statistical analysis was performed using SPSS software (ver. 22.0; SPSS Inc., Chicago, IL, USA). Descriptive statistics were calculated for

all variables, including frequencies and percentages for nominal variables and measures of central tendency (means and medians) and dispersion (standard deviations and ranges) for continuous variables. Kolmogorov-Smirnov testing was used to evaluate the distribution of the data. Significance levels of intergroup differences were analysed using Student's *t*-test. Significance levels of any differences in median values were assessed by the Mann-Whitney U-test or Chi-squared test. Quantitative data were analyzed using the Wilcoxon test.

The reliability of the T-OAR was analyzed according to its internal consistency and test-retest reproducibility. Internal consistency was determined by calculating Cronbach's  $\alpha$ , for which the minimum acceptable score was 0.7 [2, 5]. Test-retest reliability, a measure of stability and reproducibility, pertains to the ability of a scale administered on separate occasions to achieve consistent results. Test-retest reliability was calculated by comparing T-OAR results obtained at the first and second visit (separated by a 2-week interval without treatment) of the study group.

Discriminant validity was calculated by comparing T-OAR scores between the study and control groups using the Mann-Whitney U test and Chi-squared test. Responsiveness and sensitivity levels to changes in RP outcomes were analyzed by comparing the pre- and post-operative T-OAR scores of patients. *P*-values < 0.05 indicate statistical significance.

### Results

Statistically significant differences were seen between the distribution of age and gender of the cases in the study and control groups (*p* values were respectively 0.108 and 0.110). VAS was used in cases in the study group. There was a recovery on the nasal view in the postoperative period ( $8.8 \pm 0.84$ ), compared with the preoperative period ( $2.6 \pm 1.2$ ) ( $p=0.0001$ ) (**Figure 1**).

## Turkish version of the OAR

**Table 1.** Demographic data and T-OAR results for all tested groups

	Study Group (N: 35)		Control Group (N: 74)		p
	Aver±SD/n-%	Median	Aver±SD	Median	
Age (Years)	25.3±7.3	22.0	24.6±3.9	24.0	0.108 <sup>m</sup>
Gender	Female	10 28.6%	33 44.6%		0.110 X <sup>2</sup>
	Male	25 71.4%	41 55.4%		
VAS	2.6±1.2	3.0	7.6±2.2	8.0	0.0001 <sup>m</sup>
E1	4.2±0.7	4.0	1.8±1.1	1.0	0.0001 <sup>m</sup>
E2	4.2±0.8	4.0	1.6±0.9	1.0	0.0001 <sup>m</sup>
E3	4.4±0.8	5.0	1.3±0.8	1.0	0.0001 <sup>m</sup>
E4	4.3±0.8	5.0	1.2±0.8	1.0	0.0001 <sup>m</sup>
E5	4.2±0.9	4.0	1.4±0.9	1.0	0.0001 <sup>m</sup>
Total Score (E1-E5)	21.3±3.3	22.0	7.3±3.9	6.0	0.0001 <sup>m</sup>

<sup>m</sup>Mann-Whitney u test/X<sup>2</sup> Chi-squared test. Abbreviations: T-OAR, Turkish version of the Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty; Aver, Average; SD, Standard Deviation.

**Table 2.** Responsiveness of the T-OAR to changes in RP outcomes

T-OAR	Preoperative		Postoperative		p
	Aver±SD	Median	Aver±sd	Median	
E1	4.2±0.7	4.0	1.1±0.3	1.0	0.0001 <sup>w</sup>
E2	4.2±0.8	4.0	1.1±0.2	1.0	0.0001 <sup>w</sup>
E3	4.4±0.8	5.0	1.1±0.2	1.0	0.0001 <sup>w</sup>
E4	4.3±0.8	5.0	1.1±0.2	1.0	0.0001 <sup>w</sup>
E5	4.2±0.9	4.0	1.1±0.2	1.0	0.0001 <sup>w</sup>
Total Score (E1-E5)	21.3±3.3	22.0	5.3±0.5	5.0	0.0001 <sup>w</sup>

<sup>w</sup>Wilcoxon test. Abbreviations: T-OAR, Turkish version of the Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty; Aver, Average; SD, Standard Deviation.

**Table 3.** Test-retest results of the T-OAR in the study group

T-OAR	Test		Re-Test		p
	Aver±SD	Median	Aver±SD	Median	
VAS	2.6±1.2	3.0	2.7±1.3	3.0	0.052 <sup>w</sup>
E1	4.2±0.7	4.0	4.3±0.7	4.0	0.059 <sup>w</sup>
E2	4.2±0.8	4.0	4.4±0.8	5.0	0.052 <sup>w</sup>
E3	4.4±0.8	5.0	4.4±0.7	4.0	0.763 <sup>w</sup>
E4	4.3±0.8	5.0	4.3±0.8	5.0	0.705 <sup>w</sup>
E5	4.2±0.9	4.0	4.2±0.8	4.0	0.480 <sup>w</sup>
Total Score (E1-E5)	21.3±3.3	22.0	21.5±3.0	22.0	0.162 <sup>w</sup>

<sup>w</sup>Wilcoxon test. Abbreviations: T-OAR, Turkish version of the Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty; Aver, Average; SD, Standard Deviation.

### Discriminant validity of T-OAR

Scores of E1-E5 questions and total T-OAR scores in the study group were higher than those in the control group (all *p* values were < 0.05) (**Table 1**). Results suggest that T-OAR questionnaires could be used in the distinction

between RP candidates and healthy cases, indicating that T-OAR questionnaires have discriminant validity at an acceptable level.

### Responsiveness of T-OAR to changes in RP outcomes

Scores of E1-E5 questions and total T-OAR scores were lower in the postoperative period than in the preoperative period in the study group (all *p* scores were < 0.05) (**Table 2**). Results indicate that T-OAR questionnaires are effective and practicable in determining levels of satisfaction for RP cases in the postoperative period.

### Reliability of T-OAR

The test-retest method was applied to the study group in the preoperative period, minimizing the effects of treatment on questionnaire scores. Significant differences were not seen in retesting all E1-E5 scores and total T-OAR scores (all *p* values were >0.05; **Table 3**).

The internal consistency of T-OAR was high. Cronbach's  $\alpha$  value was 0.928 in the preoperative period and 0.834 in the postoperative period. Internal consistencies of previous validation studies

(Cronbach's  $\alpha$  values) are summarized in **Table 4**.

### Discussion

RP is a common surgical procedure greatly affecting the QOL of patients. Evaluations

## Turkish version of the OAR

**Table 4.** Internal consistency of the Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty

	Language versions	Cronbach's $\alpha$ values	
		Preoperative	Postoperative
Lohuis et al. [13]	English	0.857	0.837
Spiekermann et al. [16]	German	0.91	0.92
Rosa et al. [2]	Portuguese	0.88	0.86
<i>Present study</i>	<i>Turkish</i>	0.928	0.834

should be properly performed for treatment and research purposes. Many questionnaires have been used in various studies to evaluate the QOL in RP cases [8, 9].

The fact that questionnaires evaluating patient satisfaction are practicable in clinical practice is one of the reasons why surgeons should pay attention. Each survey has been designed for a different purpose. These questionnaires can be divided into three categories for RP, providing: 1) Functional; 2) Aesthetic; and 3) Both functional and aesthetic evaluations. This questionnaire (OAR) is a short and intelligible questionnaire which was designed to be especially used in aesthetic RP. The questionnaire informs the surgeon on patient ideas concerning body appearance and QOL in terms of nasal view in preoperative period. It helps the surgeon evaluate aesthetic results in the postoperative period, guiding the surgeon whether certain minor corrections need to be carried out or not [13].

A questionnaire should be translated and its cultural adaptation should be provided. Its psychometric features should be evaluated. It should be compared with the original version before it is used in a population out of the area where it was designed. Studies including these phases are validation studies. They are quite valuable. On the other hand, loss of information, validity, or reliability is a risk for each validation study and this matter should be considered. OAR questionnaires are easily applied by otorhinolaryngologists under outpatient conditions. However, a Turkish version of the OAR was not available for Turkish patients before this study was carried out. Therefore, the OAR questionnaire was translated into Turkish. Cultural adaptation was provided. Reliability and validation were carried out and the T-OAR version was formed. While Lohuis et al. [13] was designing the OAR questionnaire, they hoped that the questionnaire would be easily

applied. The T-OAR version, developed after the translation and cultural adaptation of this questionnaire, was shown to be intelligible and easily applied.

Findings of the current study suggest that the T-OAR version is a valu-

able and reliable questionnaire in evaluating RP results. The T-OAR questionnaire was shown to be effective in distinguishing between RP candidates and healthy individuals ( $21.3 \pm 3.3$  &  $7.3 \pm 3.9$ ,  $p < 0.05$ ). Scores of E1-E5 questions and total scores were found out to be high in the study group. This finding is consistent with previous validation studies in German and Portuguese [2, 16]. T-OAR scores significantly decreased in the study group in the postoperative third month, compared with the preoperative period ( $5.3 \pm 0.5$  &  $21.3 \pm 3.3$ ). The T-OAR questionnaire was found to be quite coherent, according to test-retest analysis. Moreover, results suggest that the T-OAR questionnaire had a quite high internal consistency, in accord with the original version. Cronbach's  $\alpha$  values were higher than 0.8. To the best of our knowledge, a Turkish cultural adaptation study of the OAR questionnaire had not been conducted before. The current study is the first.

Higher levels of decreases in OAR scores in the postoperative period, compared to the preoperative period, were revealed in previous studies. Rosa et al. [2] reported an average 6.94-point-decrease in total scores in the postoperative period in the Portuguese version of the OAR. Lohuis et al. [13] reported an average 6.89-point-decrease in total scores in the postoperative period in the original version of the questionnaire. Spiekermann et al. [16] reported an average 5.56-point-decrease in the German version of the OAR. Higher levels of decreases were seen in the postoperative period in the T-OAR version than in previous studies (average 16.0 points). There may be many reasons for high levels of decreases in the postoperative period. Differences between this study and previous studies might be attributed to the relatively limited number of current cases, demographic features of the cases included in the study, the higher number of male cases, and the fact that the mean age was lower than in

previous studies. The mean age was 34 years in the study of Lohuis et al. [13], 30.1 years in the study of Spiekermann et al. [16], and 25.3 years in the current study. In addition, the rate of female-male individuals was 5.4 in the study of Lohuis et al. [13] while the male gender was dominant in the current study (71.4%). Moreover, patient satisfaction decreases in RP operations over long-term. Evaluations were carried out in the 12th postoperative month in previous studies. However, they were conducted in the 3rd postoperative month in the current study. If postoperative evaluations had been carried out in the 12th month, high levels of decreases might have not been observed. However, this change which occurs in time reveals the questionnaire's response and validity. Moreover, the third and fourth questions were designed as "tricky questions" to define the disorders in body perception. Therefore, surgery could not possibly solve problems that are not directly related to the nasal view but reflected by the subjective perception of the nasal view in the long-term follow-up.

Improvement in VAS scale scores indicate that these cases were satisfied with the operation. While an average 4.44-point-improvement was seen in VAS scores in the study of Rosa et al. [2], an average 6.2-point-improvement was observed in the current study. Surgeons can evaluate operation success in cases using a simple tool like VAS. This simple scale may provide beneficial information for surgeons and patients.

The current study had both strengths and limitations. The strength of the T-OAR was statistically determined through statistical differences in preoperative and postoperative scores. The main limitations of this study were the relatively limited number of cases and short follow-up periods.

### Conclusion

In the current study, the reliability, consistency, and validity of T-OAR questionnaires were revealed. This questionnaire is a valid and reliable tool, evaluating body appearance and discomfort associated with nasal appearance in Turkish patients.

### Disclosure of conflict of interest

None.

### Abbreviations

RP, Rhinoplasty; QOL, Quality of life; OAR, The Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty; T-OAR, Turkish version of the Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty; VAS, Visual analog scale.

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## Turkish version of the OAR

### Appendix 1. Turkish version of the Utrecht Questionnaire for Outcome Assessment in Aesthetic Rhinoplasty

#### Estetik Rinoplastide Sonuç Değerlendirmesi için Utrecht Anketi

Burnumun görünümünü beğenme durumuma aşağıdaki puanı veririm;

|-----|-----|-----|-----|-----|  
1 2 3 4 5 6 7 8 9 10

Çok çirkin

Çok güzel

E1. Burnunuzun görünümü hakkında endişe duyuyor musunuz?

Hiç	Biraz	Orta	Sık sık veya fazla	Çok sık veya çok fazla
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E2. Bu endişe sizi sıklıkla rahatsız ediyor mu?

Hiç	Biraz	Orta	Sık sık veya fazla	Çok sık veya çok fazla
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E3. Bu endişe günlük hayatınızı etkiliyor mu (ör. iş hayatınızı)?

Hiç	Biraz	Orta	Sık sık veya fazla	Çok sık veya çok fazla
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E4. Bu endişe başkaları ile ilişkilerinizi etkiliyor mu?

Hiç	Biraz	Orta	Sık sık veya fazla	Çok sık veya çok fazla
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E5. Burnunuzun görünümü sizde strese sebep oluyor mu?

Hiç	Biraz	Orta	Sık sık veya fazla	Çok sık veya çok fazla
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>