

## Mental Health of Rhinoplasty Applicants: A Case Control Study

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### Abstract

**Introduction:** Rhinoplasty applicants seem to be more susceptible to psychosomatic problems compared to other cosmetic surgery groups and this can affect their decision to go in for surgery.

**Objective:** This study aims to determine the mental health of two groups the control group and the group of rhinoplasty applicants before surgery, based on their gender.

**Materials and Methods:** This case control study was conducted in 2013 at a Hospital of Rasht. A total of 136 rhinoplasty applicants and 136 individuals as the control were selected, using the availability sampling method, and investigated through a checklist of symptoms of the disease Symptom Check List-90-Revised (SCL-90-R). The data analysis was performed using the one-variable and multivariate covariance analyses.

**Results:** The main effect of grouping showed that rhinoplasty applicants had significantly higher mean scores than the control group in the interaction sensitivity components ( $P=0.017$ ) and anxiety ( $P=0.009$ ). In this case, the main effect of gender and the interactive effect of group and gender were not significant in any aspect of mental health.

**Conclusion:** Poor mental health among volunteers of cosmetic surgery can be one of the factors behind their tendency toward such surgeries, including rhinoplasty. Therefore, investigation, assessment, and psychological intervention are recommended for these applicants before surgery to improve the image of him or herself as a person and reduce the symptoms of negative psychosis.

**Keywords:** Rhinoplasty, Mental Health, Plastic Surgery

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## Introduction

Rhinoplasty is the most complex facial cosmetic surgery performed to improve the appearance of the nose [1]. It is more prevalent in women (85%) than men and most of the volunteers are aged between 20 and 29 years [2]. The epidemiology of cosmetic surgeries has been showing an increasing trend since around two decades. According to a report by the Association of Plastic and Reconstructive Surgeons (ASPRS) in 1994, affiliated with the Association and Members of the Physicians, more than 390000 cosmetic surgeries had been performed, in which rhinoplasty was one of the most commonly performed [3]. In 1999, a 19% increase in the demand for cosmetic surgery was seen only in the United States of America [4]. Finally, in 2009, the Association of American Surgeons and Restorers estimated that the number of cosmetic surgeries performed in 2008 had been around 12.1 million, which is much higher than the previous years [5].

Since cosmetic surgery is used to change the appearance of a person and increase the level of satisfaction and self-confidence, it seems that this kind of surgery can be the consequence of a particular psychological pattern [1]. Some studies conducted by the likes of Naraghi and Rahimi et al. have found that individuals who, despite the slight defects in their appearance, undergo such an esthetic surgery, often experience psychological distress and distortion as their physical imagery and their psychological profile varies with the control group [7, 6]. Also, a lot of the findings from clinical interviews has also reported a remarkable pathology of the patients of cosmetic surgery [8].

In the past, psychoanalysts believed that the worry about nose appearance, which often led to the surgery, was almost always

a sign of psychological conflict and the surgery of this abnormal sign (nose disorder) appears to eliminate psychosocial challenges such as psychological vulnerability and weakness [9]. The applicants for rhinoplasty are significantly more disturbed and undergo a surgical procedure as a “risk factor” group [10]. This potential danger is seen in male patients over 35, who demand significant surgical changes, and those who have recently disliked their noses [9, 11]. In Iran, Masoudzadeh et al. found that cosmetic surgery is common among all sections of the society and one of the reasons behind this is the inequality of personality traits and the lack of public health. Besides, obsessive-compulsive traits and low self-esteem are also more common in rhinoplasty applicants [12]. In addition, Khanjani et al. reported that the applicants for cosmetic surgery had a higher degree of vulnerability than the non-applicants in terms of psychiatric disorders [13]. In their research, Belli et al. also suggested that the evaluation of psychiatric pathology and synergies can help define the clinical profiles of those who apply for rhinoplasty [14]. Despite such reports about the relationship between rhinoplasty and negative psychological symptoms, surgeons and mental health professionals have emphasized the need to determine the mental status of preoperative rhinoplasty patients and the greater dissatisfaction with postoperative outcomes among rhinoplasty patients who experience psychological distress. The experts have also pointed out the importance of improving the awareness level of surgeons regarding the psychological symptoms associated with rhinoplasty. The possibility of screening applicants with mental disorders in one of the potential high-risk groups has led us to conduct this research with the aim of measuring the mental health of rhinoplasty

applicants referring to one of the therapeutic education centers in the city of Rasht.

### Materials and Methods

This was a case control study. The case group was composed of rhinoplasty applicants who were referred to one of the education therapeutic centers in the city of Rasht on March 2013. The control group—with similar age, gender, marital status, and education level—included clients from the same hospital, who had previously not performed any cosmetic surgery and did not intend to perform any more subsequently. In this study, the availability sampling method was used and the final sample size consisted of 272 people (136 rhinoplasty applicants and 136 non-applicants). As the hospital statistics indicated that about three-quarters of the rhinoplasty applicants were women, the census was divided into two groups of 102 women and 34 men and the control group was matched similarly.

Entry criteria included a definite request for rhinoplasty surgery and a lack of experience in any cosmetic and plastic surgery and a lack of any physical disabling disease, based on the person's own statement. Accordingly, the standard of health for the control group included the absence of any previous surgery, the absence of past record of mental illness or physical illness during the sampling, according to the individuals' own claims. In fact, the control group referred to the clients, who generally played the role of the companions of the applicants and other people; therefore, they were not admitted to the hospital and were not there because of their personal illness. During a self-report process, it was ensured that they did not have any physical illnesses at the time of the sampling.

In the process of collecting and evaluating the samples, the reasons and method for

conducting research were first explained to the subjects and they were assured that their information would remain confidential. In particular, the rhinoplasty applicants were informed that their refusal to participate in the study will not affect the process of the surgery. The process of collecting data began after obtaining the written and informed consent from the participants. This study was confirmed by the research commission of the Islamic Azad University, the Department of Science and Research in Guilan (Approved Number 61320701912055).

The research tool was the revised checklist of the disease Symptom Check List-90-Revised (SCL-90-R), which consists of 90 descriptive words about the symptoms of the disease. The patients were categorized on the basis of the severity of the symptoms (in a range of no=0, to extreme=4). Reading skills up to Grade 6 was enough to answer the questions on the checklist and the time it takes to read was usually between 12 and 15 minutes. Symptoms were scored in nine different scales (depression, physical activity, obsessive-compulsive disorder, interpersonal sensitivity, anxiety, hostility, phobia, paranoid thinking, and psychosis), as well as three General Severity Indices (GSI) (severity index), Positive Symptom Distress Index (PSDI), and Positive Symptom Total (PST) [15]. In particular, for scoring the nine dimensions, we combine the scores derived from the questions of each dimension. In the meantime, the number of depression questions was 13 (Questions 5, 14, 15, 20, 22, 26, 29, 30, 31, 32, 54, 71, 79), somatization was 12 (Questions 1, 4, 12, 27, 40, 42, 48, 49, 52, 53, 56, 58), practical obsessive-compulsive disorder was 10 (Questions 3, 9, 10, 28, 38, 45, 46, 50, 55, 65), interpersonal sensitivity was 9 (Questions 6, 21, 34, 36, 37, 41, 61, 69, 73), anxiety was 10 (Questions 2, 17, 23,

33, 39, 57, 72, 78, 80, 86), hostility was 6 (Questions 11, 24, 63, 67, 74, 81), phobias was 7 (Questions 13, 25, 41, 50, 70, 75, 82), paranoid thought was 6 (Questions 8,18,43,68,76,83), and the psychoticism was 10 (Questions 7, 16, 35, 62, 77, 84, 85, 87, 88, 90). The GSI is also a combination of nine points and seven additional questions divided by the number of test questions (90 Questions). In order to calculate the PST, zero or no responses were counted and, then, the number was deducted from the number of questions in the questionnaire (90 questions). In other words, the PST was the sum of the number of questions, to which people gave a non-zero response. Finally, we divided the total score obtained by the score from PST to calculate the PSDI. In Iran, this tool was revised and modified by Moddebernia et al in Guilan [16]. In the present study, descriptive statistics, such as the mean and standard deviation, were used to describe the data. In the inferential statistics section, to analyze the data, a one-variable covariance analysis and a multivariate covariance analysis [in a factorial design ( $2 \times 2$ ) with the aim of investigating the effects of group membership (applicant for rhinoplasty and control) and gender (men and women)] were used on the multiple dimensions of mental health by controlling age and marital status. All the analyses were performed using the SPSS software version 20.

### Results

Considering the criteria for entering the study, 136 samples (34 males and 102 females) with an average age ( $27.22 \pm 7.7$ ) ranging from 17 to 54 were selected from the applicants for rhinoplasty and 136 samples with the mean age of  $26.19 \pm 6.97$  (ranging from 18 to 47) were selected in the control group.

The findings in Table 1 showed that among the nine scales of psychometric

measurements, the mean of the four components of depression, sensitivity toward interactions, phobia, and psychoticism were significantly higher in male rhinoplasty applicants than the men in the control group while the mean of all the nine dimensions of psychological assessment was higher in women applicants than the non-applicants. In addition, the means of all the components in the rhinoplasty patients were more than that of the control group.

The multivariate analysis of covariance was used to study the main and interactive effects of the group and gender factors on the nine scales of psychometric measurements. In this study, the homogeneity assumption of the variance-covariance matrices of psychometric measures was calculated in both the groups and the result of the Mbox's statistics was significant ( $F = 0.941$ ;  $P = 0.001$ ). This means that the matrices of covariance of the dependent variables (nine scales psychometric assessment) vary between the two groups.

In order to evaluate equality of error variances for the dependent variables, the Levenes test was performed. Based on the information obtained from this test, the significance level of the F-statistic was found to be greater than or equal to 0.05 with the exception of the two components of sensitivity in the interactions

( $F_{(3, 268)}=3.07$ ;  $P=0.028$ ) and hostility ( $F_{(3, 268)}=3.48$ ;  $P=0.017$ ). Therefore, the variance of the error of depression ( $F_{(3, 268)}=2.15$ ;  $P=0.095$ ), somatization ( $F_{(3, 268)}=1.70$ ;  $P=0.167$ ), obsessive-compulsive ( $F_{(3, 268)}=3.82$ ;  $P=0.486$ ), anxiety ( $F_{(3, 268)}=2.62$ ;  $P=0.051$ ), phobia ( $F_{(3, 268)}=0.79$ ;  $P=0.501$ ), paranoid ( $F_{(3, 268)}=1.52$ ;  $P=0.208$ ), and psychoticism ( $F_{(3, 268)}=2.10$ ;  $P=0.101$ ) were different

**Table 1. Descriptive indices of nine scales of mental health measurement in two groups of rhinoplasty applicants and non-applicants by gender**

| Gender | groups      | Statistics | Depression | Somatization | Compulsation | Interpersonal Sensitivity | Anxiety | Hostility | Phobia | Paranoid | Psychoticism |
|--------|-------------|------------|------------|--------------|--------------|---------------------------|---------|-----------|--------|----------|--------------|
| Men    | Rhinoplasty | M          | 8.09       | 6.23         | 6.79         | 6.62                      | 6.44    | 3.38      | 2.23   | 6.38     | 4.76         |
|        |             | SD         | 8.44       | 7.26         | 6.02         | 5.76                      | 6.50    | 2.85      | 2.91   | 4.80     | 5.07         |
|        | Control     | M          | 6.82       | 6.29         | 7.12         | 5.21                      | 4.79    | 4.12      | 1.97   | 6.41     | 4            |
|        |             | SD         | 8.29       | 7.12         | 7.23         | 7.05                      | 6.06    | 4.25      | 2.66   | 4.89     | 4.73         |
|        | Total       | M          | 7.46       | 6.26         | 6.96         | 5.91                      | 5.62    | 3.75      | 2.10   | 6.40     | 4.38         |
|        |             | SD         | 8.33       | 7.14         | 6.60         | 6.43                      | 6.29    | 3.61      | 2.77   | 4.81     | 4.88         |
| Women  | Rhinoplasty | M          | 9.22       | 6.73         | 6.90         | 6.68                      | 7.34    | 3.86      | 2.86   | 6.86     | 5.36         |
|        |             | SD         | 7.77       | 6.70         | 5.50         | 5.52                      | 6.23    | 3.79      | 2.99   | 4.99     | 4.92         |
|        | Control     | M          | 7.16       | 5.67         | 6.22         | 4.55                      | 4.77    | 3.19      | 2.03   | 5.76     | 3.72         |
|        |             | SD         | 5.44       | 5.27         | 5.63         | 4                         | 5.14    | 2.80      | 2.60   | 4.18     | 4.17         |
|        | Total       | M          | 8.19       | 6.20         | 6.56         | 5.61                      | 6.06    | 3.52      | 2.45   | 6.31     | 4.54         |
|        |             | SD         | 6.77       | 6.04         | 5.56         | 4.93                      | 5.84    | 3.34      | 2.83   | 4.63     | 4.62         |
| Total  | Rhinoplasty | M          | 8.94       | 6.61         | 6.87         | 6.66                      | 7.12    | 3.74      | 2.71   | 6.74     | 5.21         |
|        |             | SD         | 7.93       | 6.82         | 5.61         | 5.56                      | 6.29    | 3.57      | 2.98   | 4.93     | 4.95         |
|        | Control     | M          | 7.07       | 5.82         | 6.44         | 4.71                      | 4.78    | 3.42      | 2.01   | 5.93     | 3.79         |
|        |             | SD         | 6.24       | 5.77         | 6.05         | 4.92                      | 5.36    | 3.23      | 2.60   | 4.36     | 4.30         |
|        | Total       | M          | 8.01       | 6.22         | 6.66         | 5.69                      | 5.95    | 3.58      | 2.36   | 6.33     | 4.50         |
|        |             | SD         | 7.18       | 6.32         | 5.83         | 5.33                      | 5.95    | 3.40      | 2.81   | 4.66     | 4.68         |

for the rhinoplasty applicants and non-applicants, and there is no significant difference between the two groups.

Table 2 examines the main and interactive effects of the group and gender factors and the significance of the multivariate covariance model, as well as the independent effect of each independent variable on dependent variables, by controlling the effects of age and marital status (with the coding of 0 = single and 1 = married). Based on findings in this table, the F ratios calculated for the effect of factor A (group) are significant on sensitivity in the interactions and anxiety ( $P=0.05$ ). In other words, the mean scores of scales such as sensitivity in interactions and anxiety among the rhinoplasty applicants are more than that of the control group. Meanwhile, the effect of gender factor did not appear to be meaningful for any of the nine components of psychometric measurements, which shows that there was no significant difference between the men and women in terms of the scales of psychological measurement. Meanwhile, the F ratio for the interactive

effect of the group and gender was not significant for any of the psychological scales, which indicates that there is no significant difference among the psychological components of the two groups, by gender. Since each of the three major SCL-90-R indicators has unbiased scoring methods in relation to the nine components of this questionnaire, to calculate the principal and interactive effects of group and gender factors on each of these three indicators, the one-variable covariance analysis was used by controlling the effects of age and marital status (coded 0 = single and 1 = married).

Table 3 shows that the scores for all the three indices referring to the men and women applying for rhinoplasty and the total number of applicants were higher than the counterparts. In this regard, the results of the Levene's test for equality of error variances showed that the significance level of F was less than 0.05 for the GSI ( $F_{(3,268)}=2.650$ ;  $P=0.049$ ). Therefore, the variance of error in this indicator varies in the two groups and there was a significant difference between

**Table 2: Results of the multivariate covariance analysis for the study of the effects of group and gender on the nine dimensions of psychometric measurement**

| Source of changes                             | Variables       | df | Mean of squares | F     | Sig.  | Eta   | Test power |
|---|-----------------|----|-----------------|-------|-------|-------|------------|
| <b>Group effect</b>                           | Depression      | 1  | 157.985         | 3.157 | 0.077 | 0.012 | 0.425      |
|   | Physicalization | 1  | 11.897          | 0.301 | 0.584 | 0.001 | 0.085      |
|   | Obsession       | 1  | 2.124           | 0.062 | 0.803 | 0.001 | 0.057      |
|   | Sensitivity     | 1  | 162.125         | 5.809 | 0.017 | 0.021 | 0.671      |
|   | Anxiety         | 1  | 235.395         | 6.872 | 0.009 | 0.025 | 0.743      |
|   | Hostility       | 1  | 0.029           | 0.002 | 0.960 | 0.001 | 0.050      |
|   | Phobia          | 1  | 16.606          | 2.110 | 0.148 | 0.008 | 0.304      |
|   | Paranoid        | 1  | 15.067          | 0.688 | 0.408 | 0.003 | 0.131      |
|   | Psychosis       | 1  | 73.178          | 3.363 | 0.068 | 0.012 | 0.447      |
| <b>Gender effects</b>                         | Depression      | 1  | 11.732          | 0.234 | 0.629 | 0.001 | 0.077      |
|   | Physicalization | 1  | 1.201           | 0.030 | 0.862 | 0.001 | 0.053      |
|   | Obsession       | 1  | 13.129          | 0.386 | 0.535 | 0.001 | 0.095      |
|   | Sensitivity     | 1  | 5.891           | 0.211 | 0.646 | 0.001 | 0.074      |
|   | Anxiety         | 1  | 5.294           | 0.155 | 0.695 | 0.001 | 0.068      |
|   | Hostility       | 1  | 3.222           | 0.282 | 0.596 | 0.001 | 0.083      |
|   | Phobia          | 1  | 5.118           | 0.650 | 0.421 | 0.002 | 0.127      |
|   | Paranoid        | 1  | 0.297           | 0.014 | 0.907 | 0.001 | 0.052      |
|   | Psychosis       | 1  | 1.152           | 0.053 | 0.818 | 0.001 | 0.056      |
| <b>Interactive effect of group and gender</b> | Depression      | 1  | 1.159           | 0.023 | 0.879 | 0.001 | 0.053      |
|   | Physicalization | 1  | 8.526           | 0.216 | 0.643 | 0.001 | 0.075      |
|   | Obsession       | 1  | 6.930           | 0.204 | 0.652 | 0.001 | 0.073      |
|   | Sensitivity     | 1  | 5.080           | 0.182 | 0.670 | 0.001 | 0.071      |
|   | Anxiety         | 1  | 6.020           | 0.176 | 0.675 | 0.001 | 0.070      |
|   | Hostility       | 1  | 26.806          | 2.343 | 0.127 | 0.009 | 0.332      |
|   | Phobia          | 1  | 3.830           | 0.487 | 0.486 | 0.002 | 0.107      |
|   | Paranoid        | 1  | 17.325          | 0.791 | 0.375 | 0.003 | 0.144      |
|   | Psychosis       | 1  | 9.214           | 0.423 | 0.516 | 0.002 | 0.099      |

them. Meanwhile, the significance level of the F statistics for the PSDI ( $F_{(3,268)}=1.728$ ;  $P=0.161$ ) and the PST ( $F_{(3,268)}=2.505$ ;  $P=0.059$ ) was higher than 0.05. This suggests that the variance of these two indices in the two groups was equal and there was no significant difference between them.

Table 4 examines the main and interactive effects of the group and gender factors. The significance of the three models of single-variable covariance analysis was determined separately on the GSI, PST, and PSDI by controlling the effects of age

and marital status (with the coding of 0 = single and 1 = married).

### Discussion

Based on the findings, the main effect of gender and the interactive effect of gender and group were not significant on any of the nine components and the SCL-90-R triple indicators among the rhinoplasty applicants. However, the main effect of the group was significant on sensitivity in interactions and anxiety due to the controlling of the age and marital status. These results suggest that although there was no difference between the two groups

**Table 3: Descriptive statistics of three SCL-90-R indices in two groups of rhinoplasty and control applicants by gender**

| Gender | Groups      | Statistics | (GSI)     | (PSDI)    | (PST)       |
|--------|-------------|------------|-----------|-----------|-------------|
| Men    | Rhinoplasty | M±SD       | 0.63±0.51 | 1.58±0.53 | 33.50±19.56 |
|        | Control     | M±SD       | 0.57±0.56 | 1.54±0.47 | 30.09±20.06 |
|        | total       | M±SD       | 0.60±0.53 | 1.56±0.50 | 31.79±19.74 |
| Women  | Rhinoplasty | M±SD       | 0.69±0.48 | 1.61±0.49 | 36.42±18.51 |
|        | Control     | M±SD       | 0.55±0.38 | 1.51±0.37 | 30.68±15.16 |
|        | total       | M±SD       | 0.62±0.44 | 1.56±0.44 | 33.55±17.12 |
| Total  | Rhinoplasty | M±SD       | 0.68±0.49 | 1.60±0.50 | 35.69±18.75 |
|        | Control     | M±SD       | 0.55±0.43 | 1.52±0.39 | 30.53±16.44 |
|        | Total       | M±SD       | 0.62±0.46 | 1.56±0.45 | 33.11±17.79 |

**Table 4: Results of single-variable covariance analysis to study the effects of group and gender on the GSI, PST, and PSDI**

| Source of variance | Variable | df | Mean of square | F     | Sig.  | Eta   | Test power |
|--------------------|----------|----|----------------|-------|-------|-------|------------|
| Group              | GSI      | 1  | 0.576          | 2.720 | 0.100 | 0.010 | 0.376      |
| Gender             | GSI      | 1  | 0.003          | 0.016 | 0.900 | 0.001 | 0.052      |
| Gender×Group       | GSI      | 1  | 0.067          | 0.316 | 0.575 | 0.001 | 0.087      |
| Group              | PSDI     | 1  | 0.348          | 1.761 | 0.186 | 0.007 | 0.262      |
| Gender             | PSDI     | 1  | 0.019          | 0.099 | 0.754 | 0.001 | 0.061      |
| Gender×Group       | PSDI     | 1  | 0.003          | 0.013 | 0.910 | 01.00 | 0.051      |
| Group              | PST      | 1  | 1055.202       | 3.353 | 0.068 | 0.012 | 0.446      |
| Gender             | PST      | 1  | 157.690        | 0.501 | 0.480 | 0.002 | 0.109      |
| Gender×Group       | PST      | 1  | 68.306         | 0.217 | 0.642 | 0.001 | 0.075      |

of men and women in the rhinoplasty and the control group from the point of view of psychological status before surgery, the rhinoplasty applicants showed more sensitivity and anxiety symptoms than the control group before surgery. In line with

these findings, Piromchai et al. found that the rhinoplasty applicants had a poor psychological status compared to the control group and concluded that the group of applicants was more likely to have psychological problems if and when

compared to the control group [17]. Naraghi and Atari evaluated a group of rhinoplasty applicants against a group of functional rhinoplasty applicants as the control group and found that the rhinoplasty applicants reported more psychological problems than the other group [18]. In addition, Javan Bakht et al. also showed that the mean of symptoms such as anxiety was higher in the applicant group and, therefore, stated that the neuropsychological evaluation of the rhinoplasty applicants was necessary to prevent unnecessary and repeated surgical procedures [19]. Finally, Khanjani et al. evaluated and compared the mental status of the two groups of participants with the same tool used in this study and found that the difference between the applicant and the non-applicant was significant in terms of anxiety symptoms. The mean scores of this component for the applicants were higher than the control group [13]. In explaining these findings, it seems that the rhinoplasty applicants, due to their dissatisfaction with their physical image and being affected by social and cultural feedback, suffer from inaccurate evaluations of the image of the body and negative emotions, and, hence, receive decreasing self-sufficiency. In such a case, such individuals may limit social relations and may even be isolated and subjected to anxiety and susceptibility in their social encounters. Social isolation and distraction from peers can develop so expediently in these individuals that consider one or more of their organs as deformed and hateful, resulting in reduced self-esteem, reduced mental health, and, ultimately, an attempt to obtain an acquired beauty for the organ the individual considers to be unsatisfactory.

The increase in the component of sensitivity in relationships, also highlighted in the research conducted by Seyed Toutouchi et al. [1], may be due to

the significant aggravation of the communication problems of these applicants in interpersonal situations and negative expectations in their relationships with others. Above all, they expect more respect or attention and feel uneasy compared to others. Hence, it is possible to imagine themselves in various dimensions of physical and mental illness and this negative attitude may lead to the patient's expectations of attracting more attention and a perfectionist mindset about increasing social demands by improving the quality of appearance. This kind of applicants may have a negative attitude even in the postoperative period due to the lack of access to the desired form of the nose and often feel unworthy. In other words, it seems that the rhinoplasty applicants consider the body as a psychological phenomenon in a multitude of psychological structures. But these mental imaginings are not the only things that shape the physical image for the applicants: their physical image is also affected by the experiences they encounter. Most of these experiences can also highlight social realities such as expectations and judgments that a person thinks others might have for him or her that could distort the physical images of the rhinoplasty applicants. In this respect, the cognitive-behavioral view also states that disturbance in the body image occurs when an individual experiences distortions in perception, behavior or cognition, and affection associated with beauty and body shape [21, 20]. Researchers like Puent also acknowledged that the patient's concern about their body image was the most common reason for their referral to cosmetic surgeons [22]. Tomas-Aragones and Marron also showed that physical impairment could be a common cause for the patient's application for cosmetic surgery [23].



Therefore, it is recommended to use the test and the interview before performing the rhinoplasty surgery to screen applicants, who may be potentially at psychological risk, and then use therapeutic mechanisms to improve the physical image and reduce psychological risks. As recently reported by Husain et al. and Krebs et al., the use of psychological interventions such as cognitive-behavioral therapy can improve the image of the body, reduce the symptoms, and prevent multiple surgical cycles [24, 25].

The limitations of this study include the lack of a follow-up for mental health after the operation, probably due to the lack of cooperation or inaccessibility of the rhinoplasty applicants in the postoperative period. Moreover, the nature of self-reporting of data also calls for increased bias and confounding of responses and, finally, the possibility of random sampling leads to a generalization of the results with caution. According to the results of this study, the identification of at-risk applicants and the use of therapeutic strategies aimed at improving the physical image and reducing the psychological trauma are recommended.

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### Conflict of interest

No conflict of interest has been declared by the authors.

### Author contributions

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE

(<http://www.icmje.org/recommendations/>):

-Substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;

-Drafting the article or revising it critically for important intellectual content.

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