



Mental health status among the candidates for rhinoplasty: a case-control study

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Abstract

Introduction: Mental health problems and personality disorders may influence individuals' motivation to request cosmetic surgeries. The aim of this study was to assess mental health status and personality disorders among the candidates for rhinoplasty.

Materials and Methods: This case-control study was conducted in 2019–2020. Participants were 45 candidates for rhinoplasty and 45 individuals with no request for rhinoplasty purposefully selected from the ear nose throat clinics of Ruhani hospital, Babol, Iran. Data collection instruments were the Symptom Checklist-90 Revised (SCL-90-R) and the Millon Clinical Multiaxial Inventory (MCMI). The SPSS software (v. 16.0) was employed for data analysis through the independent-sample *t* and the Chi-square tests at a significance level of less than 0.05.

Results: In the case group, 28.9% of participants had at least one psychiatric symptom and 7.26% had at least one personality disorder. The prevalence of psychiatric symptoms and personality disorders in the case group was significantly more than in the control group ($P < 0.05$).

Conclusion: Compared with individuals with no request for rhinoplasty, the prevalence of psychiatric symptoms and personality disorders is high among the candidates for rhinoplasty. Therefore, a preoperative mental health assessment is essential to improve post-rhinoplasty outcomes.

Keywords: Psychiatry, Personality disorder, Mental health, Rhinoplasty

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Introduction

Rhinoplasty is plastic surgery on the nose mostly for cosmetic purposes, during which the skin, cartilage, or bones of the nose are manipulated to change its shape or function. Based on the incision type, rhinoplasty is classified as open or closed (1). Cosmetic surgeries are among the most frequent surgeries worldwide with increasing prevalence. The prevalence of these surgeries in the United States increased by 198% from 1992 to 2000 and reached 1.3 million cases. Iran is among the top-ranked countries respecting cosmetic surgeries so more than 4 million dollars are yearly spent on these surgeries (2). The high prevalence of rhinoplasty in Iran has turned the country into the capital for rhinoplasty in the world (3–5). One of the main reasons for the high prevalence of rhinoplasty in Iran is the Islamic covering of Iranian women which covers all parts of the body except for the face and the hands (6–8).

Rhinoplasty is associated with many different complications. The early complications of rhinoplasty include bleeding, septal hematoma, obstruction, smelling alterations, edema, adhesion of the incisions, and infection. Its long-term complications are scar hypertrophy, septal perforation, nostril collapse, and stenosis (9). Accordingly, rhinoplasty is among the most difficult surgeries even for the surgeons who routinely perform it (1).

Evidence shows that mental health problems can increase the likelihood of the request for elective rhinoplasty. Psycho-behavioral disorders, characterized by recurring or fixed alterations in thinking, mood, emotions, or behaviors, personal upset or discomfort, or functional problems (10), can affect individuals' decisions and lives. Previous studies reported the high prevalence of mental health and personality disorders among the candidates for rhinoplasty and the potential effects of these disorders on their decisions for cosmetic surgeries (11, 12). On the other hand, the high prevalence of rhinoplasty among young adults in Iran (13) implies that they opt for the surgery mostly to improve their appearance and self-confidence without having any actual medical indication (14). On the other hand, dissatisfaction with rhinoplasty outcomes is higher among individuals with mental health and personality disorders and hence,

these individuals are not good candidates for cosmetic rhinoplasty (7). Dissatisfaction with rhinoplasty outcomes is in turn associated with a higher risk of postoperative psychiatric problems such as social isolation and self-destructive behaviors (15, 16). Accordingly, individuals with mental health or personality problems who undergo cosmetic rhinoplasty may finally decide to initiate legal prosecution against their surgeons or show aggression against them (12).

The high prevalence of elective rhinoplasty and its complications among individuals with mental problems highlights the need for studies into the relationship between rhinoplasty prevalence and mental health problems. Some studies in this area reported no significant difference between the general population and the candidates for plastic surgery respecting mental health problems such as depression and anxiety (17–20). However, some studies showed that mental problems had a significant relationship with the request for elective rhinoplasty. For example, a study showed that the use of psychiatric medications among the candidates for rhinoplasty was higher than in the general population (21). A case-control study on fifty candidates for rhinoplasty also revealed that the most prevalent personality disorders were avoidant and narcissistic disorders (22) and a study on 96 candidates for rhinoplasty found obsessive-compulsive disorder, depression, and anxiety as the most important psychiatric findings (23).

The contradictory results of previous studies into the relationship between mental health problems and rhinoplasty highlight the necessity for further studies in this area. Moreover, to the best of our knowledge, there are limited data in this area in the sociocultural context of Iran. Therefore, the present study was designed and conducted to narrow these gaps. The aim of the study was to assess mental health status and personality disorders among the candidates for rhinoplasty.

Materials and Methods

Design

This case-control study was conducted in 2019–2020.

Participants and setting

The study setting was Ruhani hospital, Babol, Iran. The study population of the case group consisted of the candidates for rhinoplasty who were referred to the ear nose throat clinics of the hospital, while the population of the control group consisted of individuals who were referred to these clinics to receive non-cosmetic services and were not an applicant for rhinoplasty. Groups were matched respecting participants' demographic characteristics. Sampling was performed purposefully based on the following criteria: age of 18–40 years no affliction by severe psychiatric disorders (such as schizophrenia), chronic debilitating diseases (such as multiple sclerosis and cancer), cognitive disorders, and mental retardation (for all participants), request for rhinoplasty (for participants in the case group), and no request for rhinoplasty (for participants in the control group). Exclusion criteria were voluntary withdrawal from the study and having a rhinoplasty in the past and the development of any post-rhinoplasty complication.

Sample size calculation

The sample size was calculated with a μ_1 of 6.14, a μ_2 of 11.71, a σ_1 of 5.70, a σ_2 of 8.49 (31), a confidence level of 0.95, and a power of 0.90. The sample size calculation formula (Figure 1) revealed that at least 35 participants were needed per group. Nonetheless, 45 participants were recruited to each group to compensate for probable withdrawals.

Sample size calculation formula:

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-B})^2 (\sigma_1^2 + \sigma_2^2)}{(\mu_1 - \mu_2)^2}$$

Data collection instruments

The Symptom Checklist-90 Revised (SCL-90-R) and the Millon Clinical Multiaxial Inventory (MCMI) were employed for data collection. The SCL-90-R is among the most commonly used diagnostic instruments in psychiatry. It was first introduced by Lipman et al., in 1973 and was then revised based on clinical experiences and psychometric evaluations and its final version was introduced by Derogatis et al., in 1976. It has ninety items on psychiatric symptoms in nine main

dimensions, namely somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Items are scored on a five-point scale from zero ("Not at all") to 4 ("Extremely"). Scores 1 and more show ailment and scores 3 and more show severe disorder and psychosis. Derogatis et al. reported the acceptable criterion validity of this checklist and several other studies reported the acceptable validity and reliability of the Persian SCL-90-R with a Cronbach's alpha of 0.85 (24).

MCMI is a standard self-reported inventory first introduced in 1977 and was revised and re-introduced in 1994 by the American Psychology Association. It has 175 Yes/No items on personality disorders and their associated symptoms in 28 subscales and five main categories, namely modifying indices, clinical personality patterns, personality pathology, clinical syndrome, and severe clinical syndrome. One of the strengths of this inventory is the use of base rates instead of standard scores which enables clinical experts to make more strict interpretations of the scores. Based on base rate, scores are interpreted as follows: less than 70: healthy; 70–75: likelihood of developing disorder; 75–85: the significant likelihood of disorder; more than 85: personality disorder. In the present study, MCMI was used to study the following personality disorders: schizoid, avoidant, depressive, dependents, histrionic, narcissistic, antisocial, sadistic, obsessive-compulsive, negativistic, masochistic, schizotypal, borderline, and paranoid disorders. Sharifi et al., culturally adapted and psychometrically evaluated the Persian version of this inventory in Iran and reported its acceptable reliability with Cronbach's alpha values of 0.85–0.97 (25).

Data analysis

The SPSS software (v. 16.0) was employed for data analysis. Group comparisons were made using the independent-sample *t* and the Chi-square tests. The level of significance was set at less than 0.05.

Ethical considerations

The Ethics Committee of Babol University of Medical Sciences, Babol, Iran, approved this study (code: IR.MUBABOL.REC.1399.191). Permissions for data collection were also obtained from the Research

Administration of this university and the authorities of the study setting. Participants were informed about the study aim and data confidentiality and their personal written informed consent was obtained.

Results

Participants were 45 candidates for rhinoplasty (the case group) and 45 individuals who were referred to the

study setting to receive non-cosmetic services (the control group). The mean participants' age was 27.04±6.9 years in the case group and 28.35±6.32 years in the control group. Most participants in these groups were female (66.7% vs. 55.6%) and married (51.1% vs. 57.8%). There were no significant differences between the groups respecting participants' age, gender, marital status, and educational level (P > 0.05) (Table 1).

Table 1. Between-group comparisons respecting participants' demographic characteristics.

Group		Case	Control	P value
Characteristics		Mean±SD or N (%)	Mean±SD or N (%)	
Age (Years)		27.04±6.9	28.35±6.32	0.35*
Gender	Male	15 (33.3)	20 (44.4)	0.27**
	Female	30(66.7)	25(55.6)	
Marital status	Single	22(48.9)	19(42.2)	0.52**
	Married	23(51.1)	26(57.8)	
Educational level	Below diploma	4(8.9)	6(13.3)	0.40**
	Diploma	20(44.4)	14(31.1)	
	University	21(46.7)	25(55.6)	

*: The results of the independent-sample *t*-test.

** : The results of the chi-square test.

Psychiatric symptoms had no significant relationship with marital status, educational level, and age (P > 0.05), while the prevalence of interpersonal sensitivity, depression, anxiety, and psychoticism among female participants was significantly more than their male counterparts (P < 0.05) (Table 2). On the other hand,

personality disorders had no significant relationship with gender, age, and educational level (P > 0.05), while the prevalence of narcissistic and negativistic personality disorders among single participants was significantly more than their married counterparts (P < 0.05).

Table 2. The relationship of mental health status with demographic characteristics.

Mental health status	Educational level N (%)			Marital status N (%)		Age N (%)		Gender N (%)	
	University	Diploma	Below diploma	Married	Single	30–40	18–29	Male	Female
Normal	36 (78.3)	25 (73.5)	9 (90)	39 (79.6)	31 (75.6)	29 (85.3)	41 (73.2)	32 (91.4)	38 (69.1)
Abnormal	10 (21.7)	9(26.5)	1 (10)	10 (20.4)	10 (24.4)	5 (14.7)	15 (26.8)	3 (8.6)	17 (30.9)

P value*	0.54	0.65	0.18	0.01
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*: The results of the independent-sample *t*-test.

The findings of the SCL-90-R

The total prevalence of psychiatric symptoms was 28.9% (n = 13) in the case group and 13.3% (n = 6) in the control group. The most prevalent psychiatric symptoms in the case group were paranoid ideation (40%), obsessive-compulsive disorder (35.6%), interpersonal sensitivity (35.6%), depression (33.3%),

somatization (33.3%), and psychoticism (33.3%). On the other hand, the most prevalent psychiatric symptoms in the control group were obsessive-compulsive disorder (22.2%) and depression (8.9%). The prevalence of all psychiatric symptoms, except for obsessive-compulsive disorder (P = 0.163), in the case group, was significantly more than the control group (P < 0.05) (Table 3).

Table 3. Between-group comparisons respecting psychiatric symptoms.

Group Symptoms	Normal N (%)		Abnormal N (%)		Mean±SD		P value*
	Control	Case	Control	Case	Control	Case	
Somatization	44 (97.8)	30 (66.7)	1 (2.2)	15 (33.3)	0.47±0.32	0.64 (0.5)	0.001
Obsessive-compulsive	35 (8.77)	29 (4.64)	10 (2.22)	16 (6.35)	(44.0) 67.0	(68.0) 84.0	0.163
Sensitivity	44 (8.97)	29 (4.64)	1 (2.2)	16 (6.35)	(32.0) 49.0	(59.0) 73.0	0.001
Depression	41 (1.91)	30 (7.66)	4 (9.8)	15 (3.33)	(46.0) 48.0	(73.0) 80.0	0.004
Anxiety	43 (6.95)	31 (9.68)	2 (4.4)	14 (1.31)	(28.0) 60.0	(54.0) 76.0	0.001
Hostility	45 (100)	32 (1.71)	0 (0)	13 (9.28)	(33.0) 47.0	(55.0) 68.0	0.000
Phobic anxiety	44 (8.97)	34 (6.75)	1 (2.2)	11 (4.24)	(31.0) 44.0	(56.0) 54.0	0.002
Paranoid ideation	43 (6.95)	27 (60)	2 (4.4)	18 (40)	(32.0) 51.0	(65.0) 76.0	0.000
Psychoticism	44 (8.97)	30 (7.66)	1 (2.2)	15 (3.33)	(33.0) 40/0	(61.0) 60.0	0.001

*: The results of the independent-sample *t*-test.

The findings of the MCMI

The most prevalent personality disorders in the case and the control groups were histrionic (42.2% vs. 15.6%) and obsessive-compulsive disorder (28.7% vs.

15.6%). There was no significant between-group difference respecting the prevalence of personality disorders (P > 0.05), except for histrionic disorder which was significantly more prevalent in the case group (P = 0.04) (Table 4).

Table 4. Between-group comparisons respecting personality disorders.

Personality disorders	Base rate 70–75 N (%)		Base rate 75–85 N (%)		Base rate > 85 N (%)		P value*
	Control	Case	Control	Case	Control	Case	
Schizoid	0 (0)	0 (0)	1 (2.2)	1 (2.2)	0 (0)	0 (0)	1.00
Avoidant	1 (2.2)	2 (4.4)	0 (0)	0 (0)	1 (2.2)	0 (0)	0.51
Depressive	3 (7.6)	2 (4.4)	2 (4.4)	4 (9.8)	2 (4.4)	2 (4.4)	0.78
Histrionic	5 (1.11)	5 (1.11)	4 (9.8)	10 (2.22)	3 (7.6)	9 (20)	0.04
Dependent	0 (0)	0 (0)	0 (0)	2 (4.4)	0 (0)	0 (0)	0.15
Narcissistic	2 (4.4)	1 (2.2)	3 (7.6)	8 (8.17)	1 (2.2)	3 (7.6)	0.25
Antisocial	1 (2.2)	1 (2.2)	0 (0)	0 (0)	0 (0)	0 (0)	1.00
Sadistic	0 (0)	1 (2.2)	0 (0)	0 (0)	0 (0)	0 (0)	0.31
Obsessive-compulsive	8 (8.17)	4 (9.8)	4 (9.8)	12 (7.26)	3 (7.6)	1 (2.2)	0.09
Negativistic	2 (4.4)	5 (1.11)	1 (2.2)	2 (4.4)	0 (0)	0 (0)	0.40
Masochistic	0 (0)	1 (2.2)	0 (0)	1 (2.2)	0 (0)	0 (0)	0.36
Schisotypal	1 (2.2)	1 (2.2)	1 (2.2)	0 (0)	1 (2.2)	1 (2.2)	0.79

Borderline	1 (1.1)	0 (0)	0 (0)	1 (2.2)	0 (0)	0 (0)	0.36
Paranoid	0(0)	1(2/2)	1(2/2)	0(0)	1(2\2)	0(0)	0.39

*: The results of the independent-sample *t*-test.

Discussion

This study assessed mental health status and personality disorders among the candidates for rhinoplasty. Findings showed that 26% of the candidates for rhinoplasty and 6% of participants in the control group had at least one psychiatric problem according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (26). A study in New York showed that 45.75% of the candidates for cosmetic surgeries had at least one psychiatric problem according to DSM-IV (27). A study in Iran also revealed that more than half of the candidates for rhinoplasty had at least one psychiatric symptom (28). The prevalence of psychiatric problems in these two studies is more than in the present study which may be due to the differences among the studies respecting their sample size.

In the present study, obsessive-compulsive disorder, depression, and anxiety were the most prevalent psychiatric symptoms among the candidates for rhinoplasty which is in agreement with the findings of a previous study (23). Another study reported depression and anxiety as the most prevalent psychiatric symptoms among the candidates for rhinoplasty (29). However, a study showed that the request for rhinoplasty had no significant relationship with mental health and its depression, anxiety, and maladjustment subscales (30). This contradiction may be due to the difference between the studies in terms of their mental health assessment instrument which was the General Health Questionnaire in that study (30) and SCL-90-R in the present study.

We also found that psychiatric symptoms, such as depression, sensitivity, anxiety, and psychoticism, among female participants were more prevalent than in their male counterparts. This is in agreement with the findings of a study into the psychopathological symptoms of the candidates for cosmetic surgeries in the Netherland (10). A cross-sectional study on one hundred candidates for rhinoplasty also showed that

depression, somatization, obsession, sensitivity, and anxiety were more prevalent among female participants (31). Compared with men, women more invest in their appearance due to factors such as their mental characteristics, social norms, media norms, and peer effects. A study reported that the body is the main source of identity for women and psychological mechanisms and social factors move them towards cosmetic surgeries (32).

Our findings also showed that 7.26% of the candidates for rhinoplasty had at least one personality disorder. A previous study showed that 18% of the candidates for rhinoplasty and 4% of participants in the control group had at least one personality disorder, with significant between-group differences (22). A case-control study also showed that 20% of the candidates for rhinoplasty had personality disorders. However, the difference between the case and the control groups respecting personality disorders was insignificant (33) which contradicts our findings. This contradiction may be due to the differences between the studies respecting their sample size.

The most prevalent personality disorders among the candidates for rhinoplasty in the present study were histrionic (42.2%), obsessive-compulsive (28.7%), and narcissistic (23.8%) disorders. This is in agreement with the findings of most previous studies. For example, a study showed that the most prevalent personality disorders among the candidates for cosmetic surgeries were narcissistic (8.4%) and obsessive-compulsive (13.2%) disorders (27). Another study reported obsessive disorder as the most prevalent personality disorder (23%) among the candidates for rhinoplasty (7). The most prevalent personality disorders among the candidates for rhinoplasty in another study were narcissistic (25%), dependent (12%), and histrionic (10%) disorders (34).

Limitations

One of the limitations of the present study was that mental health status and personality disorders were not assessed through structured clinical interviews.

Moreover, the study was conducted on a small sample of individuals selected from a single hospital and hence, the findings may have limited generalizability.

Conclusions

This study shows the high prevalence of psychiatric problems (such as paranoid ideation, obsessive-compulsive disorder, interpersonal sensitivity, depression, somatization, and psychoticism) and personal disorders (such as histrionic and narcissistic disorders) among the candidates for rhinoplasty. Psychological interventions to improve body image and reduce psychiatric problems are recommended to reduce the rate of unnecessary rhinoplasty surgeries. As individuals may decide on having rhinoplasty due to cognitive, personality, and interpersonal reasons, careful preoperative assessment of their mental health status and their reasons for requesting rhinoplasty is essential to improve surgery outcomes and satisfaction. Cosmetic surgeons may need to request for psychiatric consultation for the candidates for rhinoplasty who seem to have mental health problems. The present study also shows the higher prevalence of psychiatric symptoms and personality disorders among female and single candidates for rhinoplasty. Therefore, careful preoperative screening tests for these individuals are essential.

Recommendations

Multicenter studies on larger samples with the use of structured clinical interviews are recommended to produce firmer evidence respecting mental health status and personality disorders among the candidates for rhinoplasty. Moreover, future studies in this area are recommended to perform mental health assessments both before and after cosmetic surgeries and evaluate the effects of psychological interventions on the candidates for these surgeries who have psychiatric symptoms and personality disorders.

Author contribution

AT, MZ, MKh and **ZG** did this research and write manuscript, **AM** guidance and assisted in data collection and analysis of the results.

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Conflict of interest

None of the authors declare any conflict of interest.

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