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# Psychiatric morbidity among Egyptian patients seeking rhinoplasty

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## Abstract

**Background:** Rhinoplasty is one of the most common cosmetic surgeries performed on the face; seeking this operation can be influenced by socio-cultural factors, personality factors, and psychiatric morbidity. The purpose of this study is to identify the prevalence and profile of psychiatric morbidities that would present among those individuals seeking rhinoplasty and to recognize the importance of preoperative psychiatric assessment.

**Results:** 50.8% of the study sample fulfilled the DSM-IV criteria for Axis I and Axis II psychiatric disorders. The most prevalent diagnosis among the whole group was mixed personality disorder (15.2%) followed by body dysmorphic disorder (10.2%), borderline personality disorder (6.8%), and then anxiety disorders (5%). Data revealed that female non-married subjects who were performed with a previous cosmetic operation suffered significantly from psychiatric morbidity. Subjects with psychiatric morbidity showed significant ( $P, 0.000$ ) higher scores in MBSRQ health orientation and weight preoccupation than their non-psychiatric counterparts.

**Conclusion:** This study demonstrated a high prevalence of psychiatry morbidity in individuals requesting rhinoplasty. It seems important to screen individuals for mental health problems preoperatively to detect crucial psychiatric problems; thus, we can avoid subsequent risk for both individuals and cosmetic surgeons.

**Keywords:** Rhinoplasty, Body dysmorphic disorder, Psychiatric morbidity, Egyptians

## Background

The amount of cosmetic operations has dramatically increased in the twenty-first century, due to the advances in surgical technology together with the impact of mass media and the increase messages concerning beauty [1]. The face is the most important part of the body; the nose the more being the most central and prominent feature of the face has a profound effect on facial identity. Consequently, rhinoplasty is the chief among cosmetic procedures [2].

Dissatisfaction from facial appearance can occur due to various factors including socio-cultural factors, personality factors, or as a part of different psychiatric diagnoses [3].

The rhinoplasty patients desire a fundamental change in their face; indeed, they may never have been happy

with their appearance. This highlights how closely self-esteem and personality are tied to rhinoplasty [2].

The prevalence of the psychiatric morbidity among patients consulting for different cosmetic procedures reached up to 47.7% in an earlier study, and in more recent studies, the incidence of psychiatric morbidity was found to be less [4]. Psychiatric disorders were diagnosed in 32% of patients seeking cosmetic surgery in a study done by Hayashi and coworkers [5]. A more recent published population-based study that follows more than 1500 females who underwent cosmetic surgeries over a period of 13 years revealed the presence of several psychiatric symptoms, including symptoms of depression and anxiety, history of self-harm, parasuicide, and use of illicit drugs [6].

Patients with psychiatric morbidity who underwent rhinoplasty reported higher rates of dissatisfaction [7], and those patients are unhappy with their prior rhinoplasty experience, and that the perception of a suboptimal result is both legitimate and real, even if the surgeon is not in agreement [2]. Thus, they may suffer

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from negative outcomes and may create problems for their surgeons [8]. Although cosmetic enhancement is on the rise, the studies concerning the presence of psychopathological symptoms in Egyptian subjects requesting rhinoplasty were quite limited.

The aim of this study is to identify the rate and profile of psychiatric morbidities that would present among those individuals seeking rhinoplasty and to recognize the importance of preoperative psychiatric assessment for the prior selection of those subjects.

## Subjects and method

The study design was a cross-sectional, observational study. It was performed after obtaining an approval (FMASU 448/2009) from the Research Ethics Committee at the Faculty of Medicine, Ain Shams University (FWA 00006444).

The study was carried out in the Department of Plastic Surgery, Ain Shams University Hospital. It is located in Eastern Cairo and serves as a catchment area of about a third of Greater Cairo. It serves both urban and rural areas, including areas around Greater Cairo as well.

We included all patients who sought rhinoplasty surgery at the Ain Shams University Hospital, at the plastic surgery outpatient clinic during a 1-year period, and we recruited those who were 18 years old or older from both sexes and there were no exclusion criteria.

Participants were subjected to the following:

1. Designed an extensive questionnaire to elicit demographic data, personal history, and previous psychiatric consultation. Past history of major general medical diseases. Previous surgical history or cosmetic surgeries and family history of neuropsychiatric disorders
2. Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) [9]: A semistructured diagnostic interview based on an efficient but thorough clinical evaluation administered by an experienced trained bilingual researcher to match Arabic speaking patients. The study used the Arabic version of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) [10]. It was used in previous Egyptian studies.
3. The Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) [11]: It is a semi-structured clinical interview that was developed to categorically and/or dimensionally assess the DSM-IV personality disorders. It was validated to the Egyptian population in different previous studies [12].
4. Multidimensional Body-Self Relations Questionnaire (MBSRQ) [13]: It is a widely used, self-report measure of body image. The MBSRQ is a global measure of body satisfaction; it provides a

multidimensional, attitudinal assessment of body image and weight-related variables. It is meant to be used with adults and adolescents 15 years or above. It provides a multidimensional, attitudinal assessment of body image and weight-related variables. There are 69 items in this measure which are broken down into 10 subscales: appearance evaluation, appearance orientation, fitness evaluation, fitness orientation, health evaluation, health orientation, illness orientation, body areas satisfaction, weight preoccupation, and self-classified weight. The appearance evaluation scale was used to assess satisfaction and the appearance orientation scale was used to assess a cognitive and behavioral investment. The Arabic standardized version was used in this study [14].

Sixty-seven patients were recruited; however, only 59 patients were interviewed and completed the assessment while eight were excluded as they were not able to finish the scales or decided to withdraw their consent making a drop rate of 11.9%.

## Statistical analysis

Data analysis was done using Statistical Package for Social Sciences Version-16 (SPSS-16) [15] (SPSS Inc., Chicago, Illinois, USA). Student's *t* test (*t*) was used for comparison between means of quantitative data between two groups of subjects while Pearson's chi-squared test ( $\chi^2$ ) or Fisher's exact test was used for comparison between qualitative variables. A *P* value less than 0.05 was used to indicate the level of significance.

## Results

### Description of the study sample

A total of 59 subjects were included, 48 of them were females (81.4%) and 11 (18.6%) were males, the mean age of rhinoplasty seekers was  $26.4 \pm 4.47$ , 63% ( $n = 37$ ) finished their high school, and 18.5% ( $n = 11$ ) were university graduates; the rest received at least 6 years of education and none was illiterate. The majority (57.7%) ( $n = 34$ ) were single and (37.3%) ( $n = 22$ ) were married while only three subjects were divorced. The majority (66%) belonged to the middle social class followed by 29% from lower social class while only 5% from higher level class. Only 17% of subjects recorded that they underwent previous cosmetic surgery (Table 1).

The first step in this research is to estimate the prevalence and pattern of psychiatric morbidity in subjects seeking rhinoplasty.

Among all the study group, 30 subjects (50.8%) fulfilled a psychiatric diagnosis according to DSM-IV. Eleven patients (18.6%) had Axis I diagnosis, 15 patients (25.4%) had Axis II diagnosis, and 4 patients (6.8%) had

**Table 1** Profile of patients seeking rhinoplasty with and without psychiatry morbidity

Variables	With psychiatric morbidity, N = 30		Without psychiatric morbidity, N = 29		Total, N = 59		Test	
	N	%	N	%	N	%		
Gender	Male	9	30	2	7	11	18.6	$\chi^2 = 0.038$
	Female	21	70	27	93	48	81.4	
Marital status	Single	23	76.8	11	38	34	57.7	Fisher's exact 0.153
	Married	5	16.6	17	58.6	22	37.3	
	Divorced	2	6.6	1	3.4	3	5	
Level of education	Primary	2	6.6	1	4	3	5	Fisher's exact 0.864
	Preparatory	1	3.3	7	24	8	13.5	
	High school	23	76.8	14	48	37	63	
	University	4	13.3	7	24	11	18.5	
	Graduate	4	13.3	7	24	11	18.5	
Social level	High	1	3.3	2	7	3	5	Fisher's exact 0.553
	Middle	19	63.3	20	69	39	66	
	Low	10	33.3	7	24	17	29	
Post cosmetic surgery	Yes	9	30	1	4	10	17	Fisher's exact 0.397
	No	21	70	28	96	49	83	

co-morbid Axis I and Axis II, while 29 patients (49.2%) had no psychiatric morbidity as shown in Fig. 1.

The most common diagnostic category found within the sample was mixed personality disorder (15.2%), followed by body dysmorphic disorder (BDD) (10.2%), and then borderline personality disorder (6.8%). Those who had anxiety disorders were 5% including panic disorder, generalized anxiety disorder, obsessive-compulsive disorder (OCD), and social phobia. The prevalence of histrionic personality disorder and depression is 3.4% for each diagnosis, and the least prevalence of psychiatric morbidity was the comorbid Axis I and Axis II cases (Fig. 2).

We performed an assessment of self-image using the Multidimensional Body-Self Relations Questionnaire (MRSRQ) in all participants seeking rhinoplasty, and we

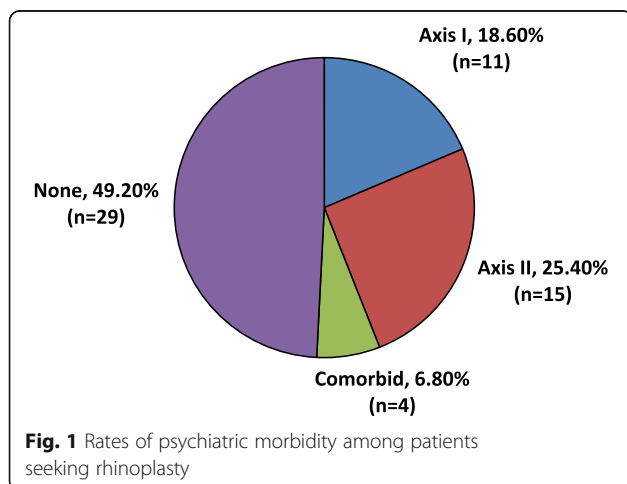
compared them to the reference mean score of the general population. The results displayed in Table 2 revealed that the study population obtained significantly lower scores in appearance evaluation, fitness evaluation, health evaluation, and self-classified weight compared to the reference population. On the other hand, they obtained higher scores in appearance orientation and illness orientation.

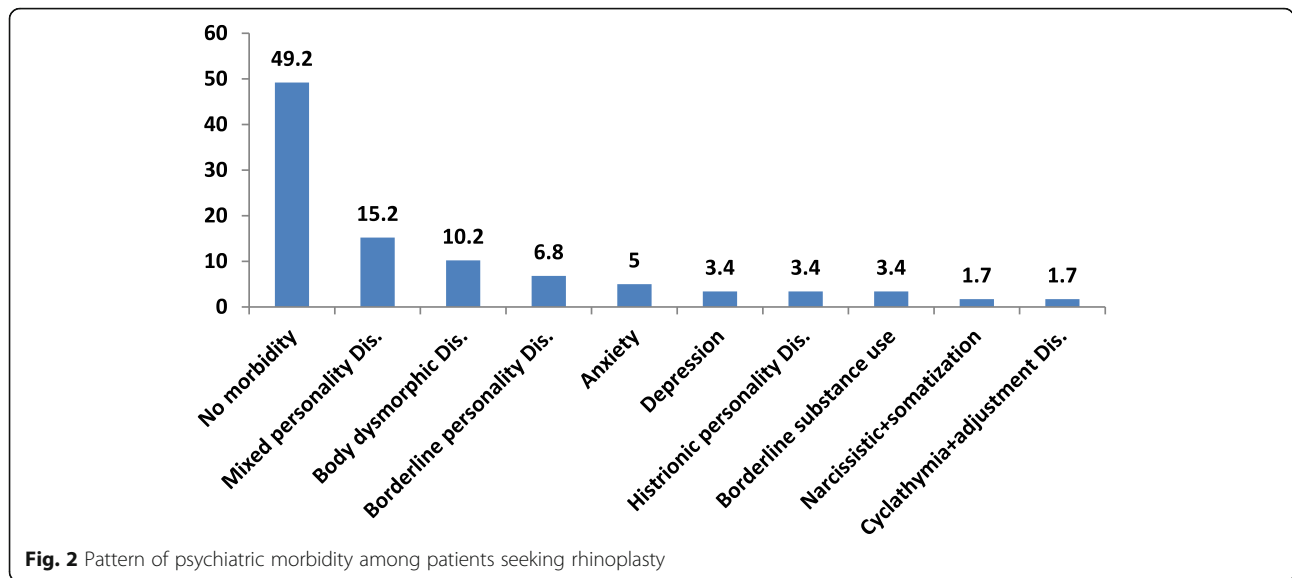
The second step in this study is to compare subjects seeking rhinoplasty with and without psychiatric morbidity as regards some variables, e.g., sociodemographic data, and scores of the Multidimensional Body-Self Relations Questionnaire (MBSRQ).

The data displayed in Table 1 revealed that the majority of the subjects with psychiatric morbidity were females (70% compared to only 30% of males,  $P = 0.03$ ). None of the other studied variables, e.g., marital status or level of education or social standards, showed any statistical differences between the two groups.

We compared subjects with and without psychiatric morbidity as regards their scores in the MBSRQ; the data clarified that individuals with psychiatric morbidity scored lower in the health orientation and the weight preoccupation items of MRSRQ than did those with no psychiatric problems and there was no significant differences could be elicited between the two groups as regard other items of the questioners (Table 3).

In Table 4, we compared patients with Axis I disorder, Axis II disorders, and combined Axis I and Axis II. Data revealed a significant association between female sex and all types of psychiatric





morbidity ( $P = 0.03$ ). Non-married subjects showed a higher prevalence of Axis II morbidity (81%) while (27%) married individuals had Axis I morbidity compared to the other groups ( $P = 0.02$ ). Subjects with Axis II morbidity showed a significantly higher percentage of exposure to previous cosmetic surgery than patients from other groups ( $P = 0.01$ ).

**Discussion**

Previous studies indicated that there many a relationship between mental health and seeking rhinoplasty [16]. Despite that most people request cosmetic surgery to feel better psychologically, yet for some subjects, this process may not give the expected results [8].

Some studies in this field revealed dissatisfaction with the physical appearance after surgery and showed that serious problems occurred for both the patient and the surgeon [17, 18].

Thus, seekers for rhinoplasty should be evaluated thoroughly for their motives and psychological disabilities prior to surgery to avoid the possible negative consequences [19, 20].

This preliminary study that we thought (for the best of our knowledge) that it is the first Egyptian study in this field, we examined a sample of rhinoplasty seekers to estimate the rate and profile of psychiatric morbidity among them.

The results of the current research indicate that DSM-IV Axis I and Axis II psychiatric morbidity comprised almost 50% of seekers for rhinoplasty. These results are consistent with some previous studies [4, 21].

In a cross-sectional study done by Alavi and co-investigators [18], two psychiatrists interviewed 306 patients seeking rhinoplasty who were referred from cosmetic surgery clinics. They used the DSM IV-TR criteria, and it was found that 126 (41%) of patients had

**Table 2** Self-image assessment of subjects seeking rhinoplasty compared to the reference population

Variable	Study population Mean ± SD	Reference population Mean ± SD	Mean Diff	Sig. (two-tailed)
Appearance evaluation	3.699 ± 0.585	3.89 ± 0.339	0.199	0.000
Appearance orientation	4.119 ± 0.233	3.36 ± 6.023	0.209	0.000
Fitness evaluation	3.175 ± 0.337	3.48 ± 6.047	0.304	0.000
Fitness orientation	3.143 ± 0.199	3.2 ± 1.899	0.056	0.064
Health evaluation	3.240 ± 0.464	3.86 ± 8.946	0.619	0.000
Health orientation	3.671 ± 0.315	3.75 ± 1.678	0.078	0.100
Illness orientation	3.373 ± 0.365	3.21 ± 2.996	0.163	0.004
Body areas satisfaction	3.145 ± 0.520	3.23 ± 1.092	0.084	0.280
Weight preoccupation	3.145 ± 0.520	3.03 ± 1.481	0.115	0.145
Self-classified weight	3.155 ± 0.462	3.57 ± 6.014	0.414	0.000

**Table 3** Comparison of self-image between subjects with and without psychiatric morbidity

	Patients without psychiatric morbidity, n = 29	Patients with psychiatric morbidity, n = 30	t	P value
	Mean ± SD	Mean ± SD		
Appearance evaluation	3.8 ± 0.16	3.5 ± 0.73	1.8	0.07
Appearance orientation	4.03 ± 0.11	4.1 ± 0.32	-1.7	0.08
Fitness evaluation	3.1 ± 0.27	3.1 ± 0.37	-0.3	0.75
Fitness orientation	3.1 ± 0.12	3.1 ± 0.25	0.63	0.52
Health evaluation	3.3 ± 0.32	3.1 ± 0.58	1.5	0.13
Health orientation	3.1 ± 0.24	3.7 ± 0.83	-2.1	0.03
Illness orientation	3.2 ± 0.32	3.3 ± 0.39	-1.3	0.18
Body areas satisfaction	3.2 ± 0.24	2.9 ± 0.72	1.6	0.11
Weight preoccupation	3.0 ± 0.24	3.3 ± 0.65	-2.6	0.00
Self-classified weight	3.1 ± 0.36	3.1 ± 0.55	-0.59	0.55

an associated Axis I psychiatric disorders. A higher rate (75%) was recorded by Morselli and Maltz [17], and the difference could be attributed to different sociocultural contexts using different assessment tools of limited studies looking at the details of the psychopathology aspects. In

contrast, Zojaji and his colleagues [22] found no significant personality disorders among subjects requesting rhinoplasty; this was the most frequent diagnostic category in our subjects. 15.2% labeled the diagnosis of mixed personality disorder, 6.8% borderline personality disorder, and 3.4% histrionic personality disorders. We are in partial agreement with the findings of Moore and Jefferson [23] who recorded that borderline, compulsive narcissistic and passive-aggressive personality disorders were encountered in their study among rhinoplasty seekers.

According to Ambro and Wright [2], the borderline patient is best identified prior to surgery and should be avoided, and also patients with a narcissistic personality, histrionic, or compulsive personality are poor operative candidates.

The prevalence of BDD is about 1% in the general population; however, it is 6 to 16 times more prevalent in esthetic surgical patients [24, 25].

Anxiety disorders including OCD were the second common Axis I diagnosis encountered in our sample (5%) followed by depression (3.4%). Almost similar findings were found by Alavi and his coworkers in the Iranian population [18].

Kisely and his colleagues [26] found that body dysmorphic disorder (BDD) is common among subjects who desired rhinoplasty; patients with this disorder often have dissatisfaction of their appearance from imagining a sense of being misshaped and thus they have needless cosmetic surgery [27].

Similarly, the most common Axis I diagnosis in the current study is the body dysmorphic (BDD) disorder (10.2%) while a lower rate (7%) was recorded by Sarwer

**Table 4** Patients with psychiatric morbidity who seek rhinoplasty

		Psychiatric diagnosis						P value
		Axis I, n = 11		Axis II, n = 15		Axis I and Axis II, n = 4		
		N	%	N	%	N	%	
Gender	Male	4	36	4	27	1	25	0.03
	Female	7	64	11	73	3	75	
Marital status	Single	8	73	12	81	3	75	0.02
	Married	3	27	2	13	0	0	
	Divorced	0	0	1	6	1	25	
Level of education	Primary	1	9	1	6	0	0	0.35
	Preparatory	1	9	0	0	0	0	
	High school	7	63	13	86	3	75	
	University graduate	2	18	1	6	1	25	
Social class	High	0	0	1	6	0	0	0.89
	Middle	8	73	9	60	2	50	
	Low	3	27	5	33.3	2	50	
Past cosmetic surgery	Yes	3	27	6	40	0	0	0.01
	No	8	73	9	60	4	100	

and Crerand [28], on the other hand, higher rates (24.5%, 32.5%, and 33%) were found by other investigators [18, 29, 30]. Differences could be attributed to different methods of assessment and diagnosis.

Mood disorders are not considered as a contraindication to cosmetic surgery; however, those patients should receive antidepressants and psychotherapy before undergoing this intervention [2].

The interest in cosmetic surgery such as rhinoplasty has been related to a number of sociodemographic variables. 81.4% of our subjects interested in rhinoplasty are women, and also 70% of them were having psychiatric morbidity. We are in concordance with previous studies in Iran that women who seek rhinoplasty outnumber men [18, 19].

In another culture, it was found that male patients seeking cosmetic surgery have been described to be more psychologically unstable. This point should be explored in socio-cultural perspective in future studies [31].

When we attempted to study some demographic variables related to the pattern of psychiatric morbidity in patients requesting rhinoplasty, we found that female patients suffered more frequently from either Axis II disorder (70%) ( $P=0.03$ ) or comorbid Axis I and II disorders. Single patients significantly seek cosmetic surgery more than married or divorced subjects ( $P=0.02$ ). Forty percent of those with Axis II disorder had a significant past history of cosmetic surgery ( $P=0.01$ ).

Body image as measured by the Multidimensional Body Self-Relation Questionnaire (MBSRQ) is compared to the reference population; the study group obtained significantly lower scores in appearance evaluation, fitness, and health evaluation. Previous investigators used the same tools stated that appearance orientation and appearance evaluation subscales are negative predictors for the interest in requesting the operation [32, 33]. Moreover, changes in self-evaluative body image are clearly associated with cognitive distortions or biases in information processing and with increased vulnerability to dysmorphic body image states [34].

## Conclusion

This study shows that Axis I and II psychiatric morbidities are commonly encountered in Egyptian patients seeking rhinoplasty; our rates and patterns of psychiatric morbidity were in partial concordance with previous findings. Thus, recognizing those patients preoperatively should be considered before the surgeon decision.

## Recommendations

With the current changes in norms and attitudes in the society and increase demand on cosmetic surgeries,

verification of mental health status of people who seek rhinoplasty becomes a mandatory need. Furthermore, psychiatric intervention—if needed—should be provided before surgical procedures. Thus, the team should include mental health professionals; also, surgeons should be familiar of psychiatric morbidity and common personality disorders that would impact their decision for surgery.

## Strength and limitation

This research (as far as we know) was the first performed in this field as we assessed Egyptian subjects requesting rhinoplasty with structured psychiatric interview for DSM-IV Axis I or II diagnoses.

Our study gives insight to the importance of mental health evaluation prior to rhinoplasty. Our study is limited by the small sample size, and thus, generalization and extrapolation of the results may be difficult. Another weak point is that we did not enquire thoroughly about the motives for surgery. Further post-operative assessment and satisfaction should be considered in future studies.

## Abbreviation

BDD: Body dysmorphic disorder; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition; MBSRQ: Multidimensional Body-Self Relations Questionnaire; OCD: Obsessive-compulsive disorder; SCID-I: Structured Clinical Interview for DSM-IV Axis I Disorders; SCID-II: Structured Clinical Interview for DSM-IV Axis II Disorders; SPSS-16: Statistical Package for Social Sciences Version-16

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## Authors' contributions

AO provided recent references for the discussion, ME was a major contributor in writing the manuscript, and RA analyzed and interpreted the patient data. MM performed the psychiatric assessment and AG and SG participated in the design of the study. All authors read and approved the final manuscript.

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None

## Availability of data and materials

The authors confirm that the data supporting the findings of this study are available within the article and/or its supplementary materials.

## Ethics approval and consent to participate

All participants signed an informed written consent after ensuring them about the confidentiality of the data obtained. All participants had the right to withdraw from the research at any time without giving reasons and without any negative consequences. The Research Ethics Committee at the Faculty of Medicine, Ain Shams University (FWA 00006444) approved the study, FMASU 448/2009.

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#### Competing interests

The authors declare that they have no competing interests.

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#### References

- Naraghi M, Atari M (2015) A comparison of depression scores between aesthetic and functional rhinoplasty patients. *Asian J Psychiatr* 14(28–30)
- Ambro BT, Wright RJ (2008) Psychological considerations in revision rhinoplasty. *Facial Plast Surg* 24:288–292
- Rasticova M (2009) Predictors of body image dissatisfaction and depression in adolescence. *E-psycholegie* 1(3):30–40
- Malick F, Haward J, Koo J (2008) Understanding the psychology of the cosmetic patients. *Dermatol Ther* 2:47–53
- Hayashi K, Miyachi H, Nakakita N et al (2007) Importance of a psychiatric approach in cosmetic surgery. *Aesthet Surg J* 27(4):396–401
- Von Soest T, Kvaalem IL, Wichstrom L (2011) Predictors of cosmetic surgery and its effects on psychological factors and mental health: a population-based follow-up study among Norwegian females. *Psychol Med* 25:1–10
- Honigman RJ, Phillips KA, Castle DJ (2004) A review of psychological outcomes of patients seeking cosmetic surgery. *Plast Reconstr Surg* 113:1229–1237
- Sarwer DB, Wadden TA, Pertschuk MJ, Whitaker LA (1998) Body image dissatisfaction and body dysmorphic disorder in 100 cosmetic surgery patients. *Plast Reconstr Surg* 101:1644–1649
- First MB, Gibbon M, Spitzer RL, Williams JBW, Benjamin LS (1995) Structured clinical interview for DSM-IV axis I disorders (SCID-I) in handbook of psychiatric measures. American Psychiatric Association, Washington, DC
- El-Missiry A, Sorour A, Sadek A, Fahy TA, Mawgoud M, Asaad T (2004) Homicide and psychiatric illness: an Egyptian study. MD thesis, Faculty of Medicine, Ain Shams University, Cairo
- First MB, Gibbon M, Spitzer RL, Williams JBW, Benjamin LS, First M, Gibbon M, Williams J et al (1997) Structured Clinical Interview for DSM-IV axis II Personality Disorders (SCID-II). American Psychiatric Press, Washington, DC
- Hatata H, Khalil A, Asaad T, Abo Zeid M, Okasha T (2004) Dual diagnosis in substance use disorders. MD thesis, Faculty of Medicine, Ain Shams University
- Brown TA, Cash TF, Mikulka PJ (1990) Attitudinal body image assessment: Factor analysis of the Body Self Relations Questionnaire. *J Person Assess* 55:135
- El Desoki MM (2006) The book of body image disorders. Anglo-Egyptian Library *اضطرابات صورة الجسم، مكتبة الأنجلو المصرية*, ISBN: 977-05-2169-8
- SPSS-16 (2009) Statistical Package for Social Sciences. SPSS Inc., Chicago
- Belli H, Belli S, Ural C, Akbudak M, Oktay MF, Akyuz Cim EF, Tabo A, Umar M, Pehlivan B (2013) Psychopathology and psychiatric comorbidities in patients seeking rhinoplasty for cosmetic reasons. *West Indian Med J* 62(5):481
- Morselli PG, Maltz M (2008) Psychocycbernetic plastic surgeon, and personal reflections on dysmorphopathology. *Aesthet Plast Surg* 32:485–495
- Alavi M, Kalafi Y, Dehbozorgi GR, Javadpour A (2011) Body dysmorphic disorder and other psychiatric morbidity in aesthetic rhinoplasty candidates. *J Plast Reconstr Aesthet Surg* 64:738–741
- Zahiroddin AR, Shafiee-kandjani AR, Khalighi-Sigaroodi E (2008) Do mental health and self-concept associate with rhinoplasty requests? *J Plast Reconstr Aesthet Surg* 61:1100–1103
- Ziglenas P et al (2014) The body dysmorphic disorder patient: to perform rhinoplasty or not? *Eur Arch Otorhinolaryngol* 271(9):2355–2358
- Javanbakht M, Nazari JA, Moghaddam L (2012) Body dysmorphic factors and mental health problems in people seeking rhinoplastic surgery. *Acta Otorhinolaryngol Ital* 32:37–40
- Zojaji R, Arshadi HR, Keshavarz M, Farsibaf MM, Golzari F, Khorashadizadeh M (2014) Personality characteristics of patients seeking cosmetic rhinoplasty. *Aesthet Plast Surg* 38:1090–1093
- Moore DP, Jefferson JW (2004) Handbook of medical psychiatry, 2nd edn. Mosby, Philadelphia
- Crerand CE (2003) Rate of body dysmorphic disorder among patients seeking facial cosmetic procedures. PhD Thesis Submitted to the Faculty of Drexel University
- Ende KH, Lewis DL, Kabaker SS (2008) Body dysmorphic disorder. *Facial Plast Surg Clin North Am* 16:217–223
- Kisely S, Morkell D, Allbrook B et al (2002) Factors associated with dysmorphic concerns and psychiatric morbidity in plastic surgery outpatients. *Aust NZ J Psych* 36:121–126
- Veale D et al (2003) Self-discrepancy in body dysmorphic disorder. *Br J Clin Psychol* 42:157
- Sarwer DB, Crerand CE (2004) Body image and cosmetic medical treatments. *Body Image* 1:99–111
- Valerie PA, Emmanuel P, Gabriëls PL, Jorissen M, Hellings PW (2011) Preoperative symptoms of body dysmorphic disorder determine postoperative satisfaction and quality of life in aesthetic rhinoplasty. *Plast Reconstr Surg J*:509–517
- Fatholooloomi MR, Tabrizi AG, Bafghi AF, Noohi SA, Makhdoom A (2013) Body dysmorphic disorder in aesthetic rhinoplasty candidates. *Pak J Med Sci* 29(1)
- Rohrich RJ, Janis JE, Kenkel JM (2003) Male rhinoplasty. *Plast Reconstr Surg* 112:1071–1085
- Jakatdar TA, Cash TF, Engle EK (2006) Body-image thought processes: the development and initial validation of the assessment of body-image cognitive distortions. *Body Image Int J Res* 3:325–333
- Javo M, Sølve T (2010) Psychological predictors of an interest in cosmetic surgery among young Norwegian women. *Plast Surg Nursing* 30(3):180–186
- Rudiger JA, Cash TF, Roehrig M, Thompson JK (2007) Day-to-day body-image states: prospective predictors of intra-individual level and variability. *Body Image Int J Res* 4:1–9

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