

Posrhinoplasty Depression: A Systematic Review

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Background: Even though an increased number of patients indicate satisfaction with rhinoplasty outcomes, unexpected postoperative psychological reactions might occur. Posrhinoplasty depression is a type of adverse psychological response in relation to cosmetic surgery.

Methods: The present systematic review seeks to evaluate postoperative depression following successful rhinoplasty in patients who are psychologically stable.

Results: The findings on posrhinoplasty depression are a reminder to cosmetic surgeons that better surgery outcomes might not consistently generate happy and satisfied patients. Even though preoperative mental evaluations are considered important in the screening of patients to undergo rhinoplasty, the assessments might not often be predictive. Cosmetic surgeons should therefore be ready and willing to aid their patients in coping with the adverse psychological responses, including depression. Moreover, this systematic review seeks to enhance the comprehension of both the preoperative and postoperative psychology and mood changes in patients undergoing rhinoplasty.

Conclusions: Plastic surgeons are required to offer effective counseling services to their patients, ensuring effective and clear communication of their expectations, to aid in the decision on whether patients are apt candidates for rhinoplasty and to reduce the possibility of posrhinoplasty depression and anxiety. (*Plast Reconstr Surg Glob Open* 2024; 12:e6321; doi: [10.1097/GOX.00000000000006321](https://doi.org/10.1097/GOX.00000000000006321); Published online 25 November 2024.)

INTRODUCTION

The last few decades have witnessed the emergence of plastic surgery as an advancing field.¹ The ongoing advancements in medical techniques and equipment in the field of plastic surgery have brought about significant effects on both pharmaceutical and surgical development. In this light, among the most notable changes in the field of plastic surgery are the increasing aesthetic surgery trends.² Regardless of the potential underlying complication risks, many individuals still pursue and undergo plastic surgery. Moreover, similar to other types of surgical procedures, plastic surgery is also fraught with various postoperative complications that might be physical or psychological in nature, with some of the most significant complications being keloids, scarring, organ damage, depression, and discontentment.³ According

to the American Society of Plastic Surgeons and the American Society of Aesthetic Plastic Surgeons, as at 2019, more than 223,000 rhinoplasty procedures were conducted in the United States.⁴ On the other hand, in Saudi Arabia, the total number of rhinoplasty operations has increased exponentially and presently represents more than 30% of the cosmetic surgical procedures conducted in the country.⁵ The increment in the number of individuals undergoing rhinoplasty procedures has been attributed to the desire to correct dysmorphic facial features, even though the influences of various beauty norms exhibited on social media have been noted to play a significant role in individual decisions to undergo rhinoplasty.⁵ Thus, it has been noted that the decision to undergo rhinoplasty is greatly influenced by the spending of several hours watching rhinoplasty related content on social media, alongside the portrayal of what is regarded as idyllic features.⁵ Figure 1 indicates the various reasons for undergoing rhinoplasty procedures among individuals living in the Kingdom of Saudi Arabia.⁶

Nevertheless, significant posrhinoplasty complications have been noted to vary between 1.7% and 18%, with the most common posrhinoplasty complications being infections, bleeding, deformities, nasal airway obstruction, and depression.⁷ In Saudi Arabia, the

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Received for publication May 11, 2024; accepted September 24, 2024.

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Disclosure statements are at the end of this article, following the correspondence information.

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.

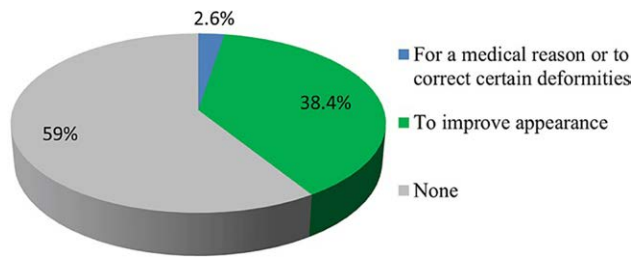


Fig. 1. The reasons for undergoing rhinoplasty procedures among Saudi Arabian citizens

prevalence of persons considering rhinoplasty and rhinoplasty revision procedures has been observed to be as high as 44.7%.⁸ The key reason for rhinoplasty in the region is mainly to enhance facial aesthetics, in addition to furthering aesthetic enhancements in individuals who have had and accepted results of initial facial aesthetic procedures (56.9%). Nevertheless, among the patients who have undergone rhinoplasty, one of the most common complaints subjectively reported by patients in Saudi Arabia included poorly defined nasal tip (32.35%), and a higher percentage (56.9%) of the patients who sought rhinoplasty procedures have reported doing so as a result of nasal obstruction.⁸

Normally, the recovery time for rhinoplasty is about 2 weeks.⁹ Additionally, rhinoplasty presents a number of side effects, with some of the significant ones being swelling under the eyes and bruising, which lead to dissatisfaction among the patients. Nevertheless, a slight swelling is anticipated, and the resolution might take approximately 6 months to 1 year.^{3,9} Moreover, postsurgical depression has been observed to be one of the notable concerns among patients who have undergone rhinoplasty. According to Jones et al,¹⁰ depression implies a mood state of gloom, pessimistic ideations, and sadness coupled with the loss of pleasure and interest in normal and regular activities. Postsurgical depression has been reported to occur more often in patients who have undergone cosmetic surgery.^{10,11} Individual satisfaction is vital in dealing with appearance, and some patients have been observed to present considerable obsession with the outcomes of rhinoplasty. As a result, a larger and increasing number of individuals who have undergone rhinoplasty have sought various aesthetic procedures to improve their appearance postrhinoplasty.¹¹

Though infrequent, postrhinoplasty psychological responses have been reported following the procedure.^{10,12} The risk of developing such mental complications, including depression, are highly probable in patients who have undergone rhinoplasty for cosmetic purposes.¹³ In this regard, several patients have aptly described their feelings as being clear cut depression postrhinoplasty.¹³ In most instances, the motive underlying the decision to undergo rhinoplasty is for attainment of improved cosmetic outcomes. The sense of discontent is regularly observed when such patients do not find the rhinoplasty results to be as they had initially anticipated. Thus, postrhinoplasty depression is considered a form of negative psychological response toward the outcomes of cosmetic surgery.^{3,13}

Takeaways

Question: To evaluate postoperative depression following successful rhinoplasty in patients who are psychologically stable.

Findings: Search included 1238 articles. After exclusions, 22 studies were included in this systemic review.

Meaning: This is important, as plastic surgeons are required to offer effective counseling services to their patients, ensuring effective and clear communication of their expectations, to aid in the decision on whether patients are apt candidates for rhinoplasty, and to reduce the possibility of postrhinoplasty depression and anxiety.

The objective of the present systematic review and meta-analysis is to evaluate postrhinoplasty depression in patients who have undergone the surgical procedure. The increased incidence rate of postrhinoplasty depression among patients should be a reminder to cosmetic surgeons that better rhinoplasty results might not consistently generate happy and contented patients. Even though the preoperative psychological evaluations might be helpful in the screening of patients who undergo rhinoplasty, the assessment might not be as predictive as one may anticipate. As such, it is important that cosmetic surgeons assist their patients in coping with the adverse psychological reactions preoperatively and postoperatively. Still, patient contentment with rhinoplasty has been noted to have direct and significant correlations with life satisfaction, body image, and self-esteem.¹¹ In instances where the patients develop optimistic insights with regard to rhinoplasty, they are highly likely to observe their noses to be more satisfying postoperatively. Thus, it is worth observing that individual contentment is not an outcome of the surgical procedure but rather the feedback from the psychological evaluation.¹⁴ Psychological assessment in patients who undergo rhinoplasty is not linked to objective deformity, and the patients' contentment following rhinoplasty is linked to their anticipation of beauty more than the cosmetic surgery needs.¹¹ As the reasons underlying postsurgical depression in patients who have undergone rhinoplasty is debatable, the findings of the present systematic review are prone to aid in the development of interventions aimed at preventing, avoiding, and minimizing postsurgical rhinoplasty depression. This may be attained through improved rhinoplasty procedures, follow-ups, and comprehensive consultations with the patients.

The Aim of Preoperation Counseling

In rhinoplasty, preoperative counseling implies the educational intervention that occurs before the surgical procedure and whose aims include the improvement of the patient's knowledge, general health, and surgical operation outcomes.⁶ Normally, undergoing a surgical procedure is always frightening regardless of whether the procedure is relatively minor or major. In this regard, preoperative counseling is conducted with the objective of alleviating patient fears and mental preparation for both the surgical process and the associated outcomes.

During the preoperation counseling, the surgeon informs the patient who underwent rhinoplasty about the various potential risks associated with the procedure potential complications, and the advantages of the surgical procedure. The key objective of rhinoplasty is to either address or correct issues linked to ill, deformed, damaged, lost, and malformed nasal region through surgical interventions.⁶ This always involves procedures that include tissue transplantation, in which tissues are transferred from a given body region to another, including cartilage or skin. Nevertheless, over time, rhinoplasty has expanded exponentially to include various cosmetic goals, as well as reversal of the effects of aging. Such expansions may be attributed to the considerable impact of the contemporary society's beauty standards.¹⁵ In particular, there has been considerable global increment with regard to rhinoplasty prevalence in the last decade.¹⁶ The upsurge in rhinoplasty prevalence is indicative of the noteworthy shift with regard to the attitude toward and the approval of facial aesthetic surgery.

In recent times, rhinoplasty has become increasingly popular in Saudi Arabia, with a considerable number of procedures being carried out annually. For instance, in the year 2020, a total of 24,964 rhinoplasty procedures were conducted in Saudi Arabia.⁶ It is vital to observe that the trends in rhinoplasty may differ over time and across different geographic locations. Globally, Saudi Arabia has been ranked 29 with regard to the highest rates of rhinoplasty.^{6,17} Moreover, according to Alharethy,¹⁸ in recent times, Saudi Arabia has witnessed a considerable surge in relation to the number of women seeking rhinoplasty procedures, highlighting the fast growing trend toward utilization of plastic surgery for purposes that included beauty enhancement. Increased media coverage of rhinoplasty procedure outcomes has, in turn, proven to be more influential, informing individual decisions with regard to visits to rhinoplasty clinics.¹⁹ In particular, persons with low self-esteem often exhibit higher plastic surgery acceptance rates.²⁰ Moreover, external motivating factors that include shyness, depression, and social anxiety have immensely contributed to the individuals' consideration of rhinoplasty procedures.²⁰ Studies have additionally investigated the impact of various socioeconomic aspects on rhinoplasty procedure prevalence.²¹ Varied demographic variables that included economic status, age, level of education, and sex have been acknowledged as some of the influential factors with regard to the decision by an individual to undergo a rhinoplasty procedure.²¹

Patient education and information has been touted as an important determinant of patient satisfaction with regard to rhinoplasty procedure outcomes.^{22,23} Various studies have indicated that contented patients often portray better health outcomes, as they are likely to adhere to the surgeon's advice, comply with the various treatment regimens, follow up on appointments, and make inquiries when necessary.^{24,25} In this regard, a study conducted by Hathway has indicated that individuals receiving preoperative counseling often have 20% desirable postoperative outcomes with regard

to the physiological, and psychological variables in comparison to individuals who do not receive preoperative counseling.²⁶ Among the notable advantages of preoperation counseling for patients who underwent rhinoplasty are reduction in the postsurgical procedure-related stress, and the realization of greater confidence in oneself postsurgery. Given that the attenuation of a rhinoplasty patient's stress and depression response is capable of aiding in faster recovery and acceptance of the procedure outcomes, this may be perceived to enable the attainment of higher confidence levels and satisfaction among patients.

Additionally, having practical and realistic expectation, maintaining effective communication with the plastic surgeon, and sharing mutual comprehension of the desired surgical operation outcomes are vital for patients who undergo rhinoplasty, as a means of preventing potential postsurgical depression.^{27,28} However, a larger proportion of patients who undergo rhinoplasty are unable to effectively visualize their postoperative facial appearance before undergoing the procedure.^{29,30} As such, the development of cheap, fast, and higher resolution photography and image manipulation software has led to the use of preoperative computer simulations that have been broadly used in rhinoplasty procedure planning.^{30,31} Thus, the use of preoperative computer simulations aids in enhancing effective communication between the patients who undergo rhinoplasty and the surgeons, in addition to enabling the patients to assume an active participatory role in the planning process of the rhinoplasty procedure.³² Moreover, the simulations alongside preoperation counseling aid in fostering realistic expectations, while also minimizing anxiety and reconciling the rhinoplasty patient's predilections and the aesthetic goals, in addition to eliminating the unrealistic expectations put forth by the patients. Nevertheless, several studies have evaluated the accuracy between the preoperative computer-simulated images and the postoperative rhinoplasty outcomes. For instance, a recent study conducted by Sang et al has disclosed that 68% of patients who underwent rhinoplasty believed that the outcomes of the rhinoplasty procedure they underwent was either anticipated or better than they had anticipated based on the preoperative computer-simulated images they were offered.³³ Consequently, a study conducted by Mühlbauer and Holm³¹ disclosed that 78.3% of the rhinoplasty patients who underwent various surgical procedures rated their general aesthetic outcomes as being similar or identical to the preoperative computer simulated images. Still, De Greve et al³⁴ in their study have disclosed an 80% agreement between the post-rhinoplasty outcomes and the preoperative computer-simulated images following a number of facial plastic surgery procedures. Based on the above observations and study findings, one may conclude that the application of technology during the preoperation counseling cannot only enhance the outcomes of rhinoplasty procedures but will also assist in the management of patient expectations in addition to facilitating the patient–physician communication and relationship. This is vital in preventing potential postrhinoplasty depression.

MATERIALS AND METHODOLOGY

Search Strategy

For this systematic review, the literature search was conducted on different online databases, including Scopus, PubMed, Google Scholar, and EBSCOhost for various observational studies focusing on depression among patients who have undergone rhinoplasty. The search mainly utilized Boolean operators with every probable combination of Medical Subject Headings terms. Additionally, the search strategy was based on 2 stages and was primarily carried out based on the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) of peer-reviewed journal articles and observational studies. The initial stage of the search strategy entailed the independent screening of the databases retrieved and identified articles' titles and abstracts by 2 researchers, separately. In instances where adequate data were available within the article's abstract to inform the decision to retain or exclude an article, the researchers made the decision on articles that needed exclusion from the full-text screening phase. If not, articles whose titles were considered relevant with regard to the topic under study, and whose abstract failed to offer adequate data to warrant exclusion were all included for the full-text screening phase.

In the second stage, which involved full-text screening, the full texts of every article retained during the initial phase were screened for the inclusion and exclusion criteria. In case of doubts, a third researcher was requested to make decisions regarding the inclusion or exclusion of the study. Thus, discrepancies realized were effectively resolved through consultation and consensus. Furthermore, the removal of all duplicate studies retained from divergent databases was conducted through the use of bibliographic managers (RefWorks and Endnote). The studies included in this systematic review and meta-analysis were mainly identified through an in-depth search on the virtual databases, in addition to searching the reference lists of identified and included studies. The search was conducted between February 15 and March 2, 2024.

Inclusion and Exclusion Criteria

For this systematic review, the inclusion criteria entailed original studies, such as randomized controlled trials, prospective cohort studies, and crossover design studies that met the following criteria: studies on depression after rhinoplasty and patient discontentment with the procedure, studies published in English language, and studies carried out during the last 10 years. Moreover, sponsored clinical trials, editorials, narrative reviews, and opinions were excluded. The initial evaluation of the articles' abstracts resulted in the removal of 823 articles.

Additionally, for the present systematic review, imperative information was extracted from the identified and included eligible articles using the following: (1) general characteristics of the study, including the names of the authors, study year, publication year, and sampling methodologies utilized; (2) the characteristics of the study population, including sample size, race, age, and sex of the study participants, as well as follow-up; (3) type

and duration of the intervention; and (4) the key study findings.

Data Collection Process

The data required were extracted from different studies and full-text articles under the assessment of the authors. The identified discrepancies were mainly resolved through discussion and consultations with experts in the fields, and information regarding the main author, year of publication, study region/site, sample size, response rate, and screening tool used were independently extracted from every study by the authors through the use of standard data extraction format.

Quality Assessment

The quality of the studies included in this meta-analysis was assessed using the Joanna Briggs Institute quality assessment tool.¹⁰ Thus, every publication's scoring was conducted through the use of the frequency scales, which were accorded yes, no, unclear, and not applicable responses. Each study's overall quality score was then computed on the basis of the overall amount of positive scores received.

Statistical Analysis

For this systematic review and meta-analysis, each statistical analysis was carried out through the use of comprehensive meta-analysis software v3.¹¹ The individual studies' prevalence rates were additionally pooled through the use of the random effects meta-analysis.¹² The heterogeneity between the studies reviewed was also evaluated using I² statistics.¹³ The I^2 statistics values, including 25%, 50%, and 75%, are representative of low, medium, and high heterogeneity, respectively.¹³ The study attributes, including sample size, research design, publication year, and location of the study, were utilized in the evaluation of the probable heterogeneity sources across different studies. Egger regression tests and funnel plots were additionally used in the assessment of publication biases. For every analysis conducted, for statistical significance, the P value was set at 0.05.

RESULTS

As noted earlier, for the present systematic review and meta-analysis, the study selection process was mainly conducted using PRISMA. Thus, the study selection process yielded a total of 1238 article records that were retrieved following in-depth database search. The screening of the articles was conducted and resulted in the removal of 776 duplicates along with another 131 articles that were found to be ineligible by automation, particularly records eliminated by literature search automation tools, in this case, the Medical Subject Headings analyzer. Also, an additional 92 articles were excluded for other notable reasons, including the failure to align with the present study's objectives, and being animal-based studies. Still, studies published in nonpeer-reviewed journals alongside dissertations were excluded. Studies initially published in languages other than English were also excluded. Additionally, opinion

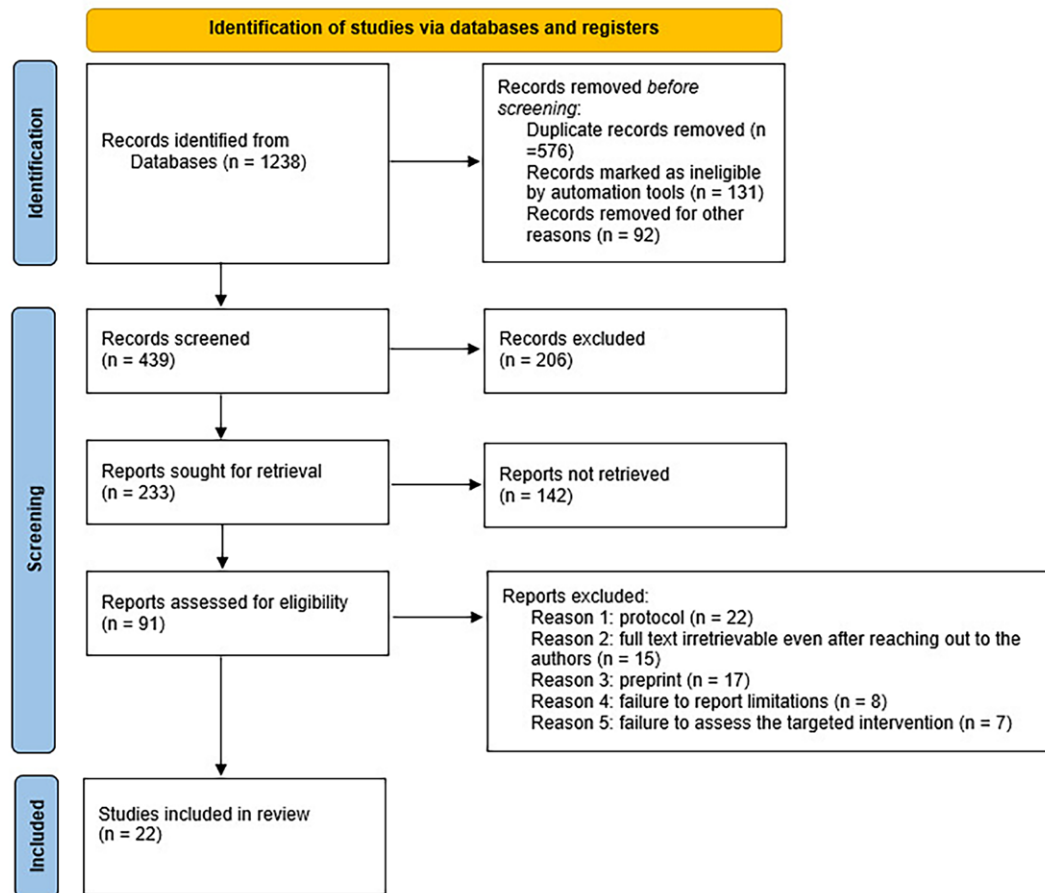


Fig. 2. PRISMA flow diagram indicating the study search and identification processes.

pieces and articles not authored and published by academics, as well as scoping reviews, secondary studies, and other research types that did not meet qualifications as primary studies were excluded. Therefore, a total of 439 eligible studies underwent additional screening, leading to the exclusion of a further 206 articles. The remaining 101 studies were sought for retrieval, of which the researchers were unable to retrieve 12 articles. This led to the evaluation of 91 studies for eligibility, which resulted in the exclusion of 69 studies following full-text screening for reasons that included protocol (22 articles), full text not retrievable even after reaching out to the authors (15 studies), preprint (17 studies), failure to report limitations (8 studies), and failure to assess the targeted intervention (7 studies). As a result, only 22 studies met the set inclusion criteria and qualified for the current systematic review and meta-analysis as indicated in [Figure 2](#).

Characteristics of the Included Studies

For this review study, a total of 22 studies were identified, screened, and included in the final meta-analysis. Of the 22 studies included, all were published between 2010 and 2024. The studies were mainly conducted in regions with a higher number of patients seeking rhinoplasty, including the United States, Germany, the United Kingdom, Asia, and the Middle East Region.

Quality of Studies Included

The articles selected for the final analysis were evaluated for quality using the Joanna Briggs Institute quality assessment checklist, and had an 8.75 mean quality score that ranged between 7 and 9. As a result, 13 articles were found to be of highest quality with a score of 8.75 or more, and the other 9 articles were found to be of moderate quality with scores ranging between 6 and 8.75. As such, none of the 16 articles identified were of poor quality. Furthermore, to reduce the risk of bias associated with individual studies, only publications whose results were from double-blind, randomized, and controlled trials were considered and included. The duplicated titles identified from the in-depth search conducted on the different databases and with slight differences in the title entries and authors in the different databases were excluded. Also, to reduce the risk of bias across the different studies, all pertinent data in the identified studies were utilized in addition to ensuring that the studies had no selective reporting, which is a strategy that enabled the avoidance of selection bias.

DISCUSSION

The popularity of aesthetic surgery continues to grow as an increased number of patients seek to enhance

their physical attributes along with self-perception. The Aesthetic Society has, in this regard, observed that aesthetic surgery increased by more than 40% between 2020 and 2021.³⁵ Such increments in the number of aesthetic operations can be partly attributed to the increase in societal pressure with regard to body image and the increased use of various social media platforms. Moreover, since the 2020 COVID-19 pandemic, there has been an increased uptake of Zoom (San Jose, CA), making it a popular and preferred video conferencing tool for educational and occupational communication. The increased use in such contexts has led to increased awareness of appearance, leading to increased incidence and aggravated body dysmorphic symptoms.³⁶ The increased appearance awareness alongside self-critiquing with the different video conferencing forms has been referred to as “zoom dysmorphia,” which has been found to increase the demand for aesthetic procedures.³⁷ In this regard, it is noteworthy that several studies conducted in Saudi Arabia and other regions of the world have reported poor general psychological health and mental disturbances as the reason underlying the urge to undergo rhinoplasty procedures.⁵ A similar study conducted in Norway disclosed that interests in rhinoplasty were highly likely in younger women and men with body dysmorphic disorder (BDD).³⁸ Such observations have been aptly supported by the findings of the study conducted in Iran’s Shiraz University of Medical Sciences.³⁹ The demand for aesthetic procedures is also clouded by several psychological aspects that may affect the way patients respond postoperatively.

Being a common aesthetic surgical procedure, rhinoplasty has been performed for prolonged periods and has turned out to be increasingly popular across the globe. In the field of facial aesthetic surgery, rhinoplasty takes a bigger proportion. However, regardless of the large amount of literature on rhinoplasty, including the technical details, psychological assessments, and preselection criteria, at present, there is a limited amount of literature focusing on postsurgical depression in patients who have undergone rhinoplasty and its effects on health-related quality of life. Thus, there exists a general dearth of aptly controlled research regarding the psychosocial results of the aesthetic surgical procedures in otolaryngology. Currently, particularly in contemporary medicine, it has become increasingly significant to assess the advantages of the surgical procedures. There is less acceptance of the complications occurring after cosmetic procedures among patients and surgeons. On the contrary, patients who undergo elective cosmetic surgery have been observed to be highly likely to be sensitive to the appearance of their bodies following the surgery. Postoperatively, a number of patients who undergo rhinoplasty may develop depression as a result of discomfort and pain linked to recovery, and others may feel down and moody at the regularly distressing sight of swelling and recuperative bruising, anticipated following rhinoplasty.⁴⁰ Additionally, having to stay indoors for prolonged periods as the body recovers, and having to refine and readjust the normal sleep position with the objective of ensuring optimum recovery might be disconcerting. Still, a number of patients who

have undergone rhinoplasty have also been found to be prone to mild anxiety and depression, and undergoing rhinoplasty might act to worsen their conditions. Such instances of depression development have been attributed to the observation that individuals who undergo rhinoplasty normally have higher expectations for the procedure’s results, and often get disappointed when such expectations are not met.⁴¹ The changes in facial appearance following rhinoplasty might turn out to be a major trigger with regard to development of BDD, characterized by the obsessive concentration on the perceived flaws in facial appearance by the patient.^{42,43} Individuals with BDD normally experience social isolation, anxiety, and depression attributed to the increased preoccupation with their facial appearance after rhinoplasty.

A study that evaluated the incidence and attributes of postrhinoplasty acne and the identification of the underlying risk factors disclosed that a significant correlation existed between anxiety and acne incidence postrhinoplasty.¹ The study also disclosed higher stress and depression levels among the patients postrhinoplasty.¹ Thus, according to Bakhshaei et al,¹ the normal hospital anxiety and depression levels were observed in 29.6% of the patients who underwent rhinoplasty with borderline levels being observed in 38.8% of the patients, and modest-to-severe depression levels being observed in 31.6% of the patients postrhinoplasty. Similarly, Piromchai et al⁴³ have observed that individuals who undergo aesthetic surgery have been found to have high preexisting mood disorder incidence rates in comparison to those pursuing other types of cosmetic surgery for functional purposes. Though mood and body image may improve postrhinoplasty, a number of studies have reported exacerbated postoperative depression and anxiety symptoms, thereby highlighting an area of rhinoplasty that requires more research.⁴⁴

Additionally, a recent study conducted by Čaušević et al⁴⁵ has disclosed that patients who underwent rhinoplasty are always burdened by various preexisting psychological challenges, and the most common diagnoses include depression, unstable personality, and impulsivity. Similar to other aesthetic operations, body image improvement has been found to be the key driving force for the increased pursuit of rhinoplasty, and the enhancement of quality of life remains the collective outcome. Nonetheless, negative psychological responses to rhinoplasty have been disclosed to happen in approximately 50% of patients, and depression and anxiety are the most widespread outcomes.⁴⁵ A study conducted by Goin et al⁴⁶ disclosed that patients who underwent rhinoplasty presented with early postoperative depression and anxiety more regularly compared with the other aesthetic surgery patients. A prospective study conducted by Goin et al⁴⁶ investigated 50 female patients who underwent rhinoplasty using psychological interviews. Goin et al evaluated patients preoperatively through the use of psychological interviews, and this was repeated again postoperatively at different time-points for up to 180 days (6 months). The findings of the study disclosed that nearly 30% of the patients developed post-surgical depression at certain points in the course of the postoperative follow-up.⁴⁶ The timing for the emergence

of the depressive symptoms was found to be reliant on several factors that include personality factors and various individual stressors. The study concluded that patients who underwent rhinoplasty who had preexisting depression were highly prone to have had considerable impact on their depressive reactions postoperatively. Moreover, patients who underwent rhinoplasty with definite depression-prone personality trait, including neuroticism, were highly prone to develop postoperative depression.^{10,46} Similarly, other studies have reported statistically significant differences in relation to the self-esteem scores in patients whose rhinoplasty procedures were planned for aesthetic purposes, as they had lower mean scores in comparison to those who planned rhinoplasty for functional problems as opposed to aesthetic purposes.⁴⁷ The outcomes of the study conducted by Hashemi et al⁴⁸ indicated the existence of lower self-esteem values alongside lower body image measures in patients who underwent aesthetic rhinoplasty.

Furthermore, a study by Naraghi and Atari⁴⁹ evaluated depression incidence in patients who underwent aesthetic rhinoplasty and 21 patients with functional rhinoplasty through the use of a preoperative Beck Depression Inventory and the depression subscale of Symptom Checklist-90-Revised. The study findings on the depression scale indicated considerably higher scores among the aesthetic rhinoplasty patients' cohort in comparison to the functional rhinoplasty cohort.⁴⁹ The measurement of the psychological reactions following rhinoplasty was also performed in the prospective study by Kütük and Arıkan.⁵⁰ In the study, the 200 patients who underwent rhinoplasty were required to complete the Brief Symptom Inventory to enable the assessment of their psychological status preoperatively, and this was conducted again postoperatively at 30 and 180 days. The findings of the study indicated that preoperatively, the Brief Symptom Inventory scores were normal for the entire cohort, and that there was a considerable decrement in depression for the patients at the 180-day time-point.⁵⁰

Even though the most intriguing psychological outcomes of aesthetic rhinoplasty have been reported by Goin et al in their postsurgical depression study in patients who underwent rhinoplasty,⁴⁸ the findings have been attributed to increased swelling and bruising, and the facial operation's nature, which cannot be hidden, thereby making the process of healing increasingly difficult for the patient to endure.⁴⁶ However, similar postoperative depressive reactions have not been observed by Meningaud et al.⁵¹ The study conducted by Meningaud et al disclosed that anxiety noticeably improved following facial surgery, which further led to the conclusion that depressive symptoms might have also improved, as the 2 psychological states are always comorbid.⁵¹

Nevertheless, a number of other studies have also reported contradictory findings in relation to the levels of depression among patients postrhinoplasty. For instance, in their study, Bensoussan et al⁵² have disclosed the existence of significant increment in self-esteem and improvement in depression and anxiety levels postoperatively in patients who underwent aesthetic rhinoplasty during the

follow-up period at 6 months. Similarly, Goin et al⁴⁶ have disclosed that the postoperative depression scores ultimately equalized to levels that were lower in comparison to the preoperative scores at 6 months. Also, a study conducted by Moss and Harris⁵³ focused on the evaluation of the long-term impacts of cosmetic procedures, including rhinoplasty, disclosed that aesthetic surgery improved anxiety, depression, and self-esteem among patients. These findings are increasingly consistent with those of the study conducted by Von Soest et al,⁵⁴ which has disclosed an increment in self-esteem and improvement in depression and anxiety post aesthetic surgery. Various studies have additionally indicated that different psychological variables, including anxiety and depression, portrayed significant improvements after aesthetic surgery.^{49,55} The present study also supports the observation that rhinoplasty is linked to negative body image alongside low self-esteem, as disclosed by the study conducted by Naraghi and Atari.⁴⁹ (See table, Supplemental Digital Content 1, which displays the studies selected and included in this systematic review alongside the summaries of their objectives and findings. <http://links.lww.com/PRSGO/D636>.)

CONCLUSIONS

Rhinoplasty is among the most intricate and difficult operations in the field of plastic surgery. The present study's findings suggest that the satisfaction level among patients who have undergone rhinoplasty was lower with a number of psychological complications being reported. Depression, which is one of the most reported mental issues associated with rhinoplasty outcomes, has been noted to be highly prevalent among patients who are discontented with the outcomes of the surgical procedure. Major depression remains a chronic health condition that should be a major concern to surgeons undertaking cosmetic procedures, given that the condition affects the patients and their families. Moreover, depression and anxiety have been found to be higher in patients who seek or have undergone facial aesthetic operations, and depression, as opposed to anxiety, has been observed to be widespread among patients who have undergone rhinoplasty procedures. Increased incidence rate of body dysmorphism has additionally been noted in patients pursuing rhinoplasty procedures for facial aesthetics. The findings of this systematic review and meta-analysis reinforce the observation that every aesthetic patient is "in effect" a psychiatric patient, which is a significant correlation for surgeons to always take into consideration. Additionally, this lays emphasis on the significance of in-depth and detailed evaluation and clarification with regard to the anticipations of the patients, as well as the actual surgical possibilities. Proper communication, thoughtful consideration of various risk factors linked to rhinoplasty consideration and outcomes, and listening to the patients is prone to result in successful procedures with lower rates of depression and anxiety. The provision of careful attention to the patient's reason for the decision to undergo rhinoplasty may significantly contribute to an increasingly successful surgical outcome, and the comprehension of

potential complications and risks may offer increased levels of patient satisfaction.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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