JHWCR JOURNAL OF HEALTH, WELLNESS AND COMMUNITY RESEARCH 3007-0570

Vol. 4 Issue 3, 2026
Open Access | 10.61919/pt42dj98

Original Article

Rate and Predictors of Satisfaction after Noninvasive Facial Cosmetic Procedures

Maham Saleem Bhatti[1], Muhammad Shahram Tanveer[2], Muhammad Naveed Babur[3]

[1] Faculty of Allied Health Sciences, The Superior University, Lahore, Pakistan
[2] Faculty of Allied Health Sciences, The Superior University, Lahore, Pakistan
[3] Professor, Faculty of Allied Health Sciences, The Superior University, Lahore, Pakistan

✉ **Correspondence:** Muhammad Shahram Tanveer, muhammadshahram.tanveer@superior.edu.pk

Received: 12/31/2025 **Accepted: 2/4/2026** **Published: 2/15/2026**

HOW TO CITE

Maham Saleem Bhatti et al. 2026. Rate and Predictors of Satisfaction after Noninvasive Facial Cosmetic Procedures. Journal of Health, Wellness and Community Research. 4(3). DOI: https://doi.org/10.61919/pt42dj98

ARTICLE INFORMATION

Author Contributions	Concept: MSB, MNB; Design: MSB, MST, MNB; Data Collection: MSB, MST; Analysis: MSB, MST, MNB; Drafting: MSB, MST, MNB.
Ethical Approval	The study was approved by research ethical board of The Superior University, Lahore, Pakistan
Informed Consent	Written informed consent was obtained from all participants
Conflict of Interest	The authors declare no conflict of interest.
Funding	No external funding.
Data Availability	Available from the corresponding author on reasonable request.
AI Declaration	No generative AI was used for conceptualization, analysis, or content generation. AI use was limited to language refinement, and the authors remain fully responsible for the accuracy, originality, validity, and integrity of the manuscript's content.

ABSTRACT

Background: Patient satisfaction is an important outcome of aesthetic treatment and may be influenced by treatment expectations, procedural complications, provider characteristics, follow-up care, and psychosocial factors. Aesthetic practice encompasses procedures with substantially different levels of invasiveness and risk, making accurate characterization of the treatment population important when interpreting satisfaction outcomes. Objective: To determine satisfaction after facial cosmetic procedures and examine demographic, procedural, and post-treatment factors associated with satisfaction among adults in Punjab, Pakistan. Methods: A cross-sectional questionnaire study included 102 adults aged 20–40 years attending dermatology and aesthetic clinics in Punjab. Participants were recruited purposively. Demographic characteristics, provider specialty, procedure history, post-treatment complications, emergency attendance, follow-up contact, satisfaction, duration of satisfaction, and willingness to repeat treatment were recorded. Selected binary associations were evaluated using Fisher exact testing and odds ratios with 95% confidence intervals. Results: Fifty-seven participants (55.9%) were very satisfied and five (4.9%) were satisfied, whereas 34 (33.3%) were dissatisfied. Sixty-three participants (61.8%) reported no complications, while 39 (38.2%) reported asymmetry, scars, infection, or wound infection. Combined satisfied/very-satisfied status occurred in 55/63 participants without complications compared with 7/39 participants with complications, corresponding to an OR of 31.43 (95% CI 10.42–94.80; Fisher $p<0.001$). Emergency-department attendance occurred in 32/39 participants with complications compared with 3/63 without complications. Participants who did not know the specialty of their treatment provider also reported substantially more complications than those identifying their provider as a dermatologist or plastic/reconstructive surgeon. Conclusion: Satisfaction was strongly associated with the absence of post-procedure complications. However, the cross-sectional study does not establish independent predictors because no adjusted multivariable predictive model was performed. The procedural dataset also included interventions of substantially different invasiveness, including liposuction, fat injection, and thread procedures. Future studies should use standardized patient-reported outcome measures, clearer procedural classification, and multivariable analysis. Keywords: Cosmetic Procedures; Patient Satisfaction; Aesthetic Medicine; Complications; Follow-Up; Patient-Reported Outcomes.

INTRODUCTION

Aesthetic procedures are increasingly evaluated not only according to technical outcomes but also according to patients' perceptions of appearance, treatment experience, psychological well-being, and satisfaction. This emphasis is particularly important in aesthetic medicine because the principal benefit of many interventions is patient-perceived improvement rather than treatment of a life-threatening

© 2026 The Author(s). This is an open access article distributed under the terms of the Creative Commons Attribution (CC BY 4.0) License | jhwcr.com

disease. Patient-reported outcome measures therefore provide information that clinician-assessed appearance alone cannot fully capture. The FACE-Q Aesthetics framework and its related scales were developed specifically to measure constructs such as satisfaction with facial appearance, treatment outcomes, health-related quality of life, and procedure-related adverse effects, and they have become important standardized instruments in facial aesthetic outcomes research (1–4).

Contemporary studies of non-surgical and minimally invasive facial aesthetic treatment generally report substantial levels of patient satisfaction, although satisfaction is not uniform across patients or procedures. Treatment expectations, perceived improvement, discomfort, previous treatment experience, complications, durability of the result, and the broader treatment experience may all contribute to how patients evaluate an aesthetic intervention (5–8). Studies of facial fillers and other minimally invasive treatments have consequently emphasized that a technically successful intervention does not necessarily translate into equivalent satisfaction for every patient and that patient-reported outcomes should be evaluated separately from clinician-rated aesthetic improvement (5–8).

Post-procedure adverse events are especially important when satisfaction is considered. Hyaluronic-acid fillers are generally associated with transient injection-site reactions, but clinically important inflammatory, vascular, and other complications can occur (9,10). Botulinum toxin procedures likewise have a generally favorable safety profile but can produce adverse effects related to injection site, dose, anatomy, and diffusion of treatment (11). Thread-lifting procedures have distinct complication profiles that include swelling, dimpling, thread visibility or extrusion, infection, and contour abnormalities (12). Autologous facial fat grafting introduces further risks because it involves tissue harvesting and reinjection, with systematic reviews documenting both common postoperative events and uncommon but potentially severe vascular, ophthalmic, or neurologic complications (13,14). Serious ocular complications have also been described after both hyaluronic-acid filler injections and facial fat grafting, illustrating why anatomical knowledge, appropriate technique, patient selection, and timely recognition of adverse events remain central to aesthetic practice (15,16).

Psychosocial context is another relevant component of aesthetic-treatment satisfaction. Social-media exposure, image-focused platforms, filtered photographs, and idealized appearance standards may influence body-image perceptions and consideration of cosmetic procedures (17). Psychological characteristics are also relevant because body dysmorphic disorder occurs at clinically important frequencies among populations seeking aesthetic or cosmetic interventions, although prevalence varies markedly according to population and screening method (18,19). Recent cross-sectional evidence has additionally examined relationships among social-media exposure, filtered self-images, body-image perception, and satisfaction after aesthetic treatment, reinforcing the importance of considering patients' expectations and psychosocial context alongside procedural outcomes (20).

A further methodological issue is the classification of cosmetic procedures. Non-invasive treatments, minimally invasive injectable procedures, thread-based interventions, fat grafting, and surgical procedures are not interchangeable categories. Facial thread lifting penetrates and mechanically repositions tissue, while facial autologous fat grafting requires harvesting and reinjection of adipose tissue (12–14). Liposuction is an operative method of adipose-tissue removal and has a complication profile distinct from non-invasive aesthetic treatments (21,22). Studies that combine such procedures therefore represent heterogeneous aesthetic-treatment populations and should be interpreted accordingly.

Against this background, the present study evaluated satisfaction among adults who had undergone facial cosmetic procedures in Punjab, Pakistan. It examined satisfaction in relation to procedure history, reported complications, provider specialty, emergency-department attendance, post-procedure specialist contact, and selected demographic characteristics.

MATERIALS AND METHODS

Study Design and Participants

A cross-sectional study was conducted over four months at dermatology and aesthetic clinics in major cities of Punjab, Pakistan. A total of 102 adults aged 20–40 years were recruited using purposive sampling.

Eligible participants had undergone one or more cosmetic procedures during the preceding six months to two years. The protocol eligibility list included botulinum toxin injections, dermal fillers, laser

resurfacing, chemical peels, microneedling, and related facial aesthetic procedures. The questionnaire also captured liposuction, fat injection, thread procedures, and treatment of specific facial or neck regions. Consequently, the analyzed sample represented a broader range of aesthetic interventions than exclusively non-invasive procedures.

Participants with severe dermatological conditions, relevant systemic autoimmune disease, pregnancy or lactation, incomplete treatment sessions, or inability to understand the questionnaire were excluded according to the study protocol.

Questionnaire and Variables

A structured questionnaire adapted from previous research on satisfaction after facial cosmetic procedures was used (5). The questionnaire underwent review by two plastic surgeons and linguistic review by two language experts, with a reported content-validity index above 0.80. Recorded variables included age, sex, educational level, marital status, occupation, income, provider specialty, individual aesthetic procedures, treatment location, payment source, complications, post-treatment symptoms, emergency-department attendance, contact with a specialist before scheduled follow-up, satisfaction level, duration of satisfaction, and willingness to undergo treatment again. Satisfaction was recorded as very satisfied, satisfied, neutral, or dissatisfied. Complications were categorized as no complication, asymmetry, scar, infection, or wound infection. For additional binary analysis, very satisfied and satisfied responses were combined as a positive satisfaction outcome, while asymmetry, scar, infection, and wound infection were combined as any complication.

Statistical Analysis

Categorical variables were summarized as frequencies and percentages. Associations were evaluated using contingency-table methods, including chi-square testing where applicable. Where complete binary cell counts permitted deterministic reanalysis, Fisher exact testing and odds ratios (ORs) with 95% confidence intervals (CIs) were calculated. Because the study was cross-sectional and no multivariable predictive model was performed, the findings were interpreted as associations rather than causal effects or independent predictors, consistent with established principles for reporting observational research (23). Ethical approval was obtained from the Institutional Review Board of Superior University, Lahore, Pakistan.

RESULTS

Participant Characteristics

A total of 102 participants were included. Most participants were female, married, employed, and between 26 and 35 years of age.

Table 1. Demographic and Professional Characteristics

Characteristic	Category	n (%)
Age	20–25 years	14 (13.7)
	26–30 years	33 (32.4)
	31–35 years	32 (31.4)
	36–40 years	23 (22.5)
Sex	Male	17 (16.7)
	Female	85 (83.3)
Education	Elementary school	17 (16.7)
	Middle school	20 (19.6)
	Bachelor's degree	41 (40.2)
	Higher education	24 (23.5)
Marital status	Single	12 (11.8)
	Married	85 (83.3)
	Widowed	2 (2.0)
	Divorced	3 (2.9)
Occupation	Student	12 (11.8)
	Unemployed	20 (19.6)
	Employed	70 (68.6)
Income	PKR 10,000–20,000	102 (100)
Provider specialty	Unknown to participant	35 (34.3)
	Dermatologist	27 (26.5)
	Plastic/reconstructive surgeon	40 (39.2)

The complete homogeneity of the recorded income category prevented meaningful assessment of socioeconomic gradients within the study population.

Procedure History

Participants could report more than one procedure or treated facial region. Liposuction and fat injection were the most frequently recorded procedures, followed by botulinum toxin and filler injections.

Table 2. Reported Aesthetic Procedures and Treatment Regions

Procedure/Region	Yes, n (%)
Liposuction	95 (93.1)
Fat injection	78 (76.5)
Botulinum toxin	39 (38.2)
Filler injection	36 (35.3)
Face/nose threads	20 (19.6)
Microneedling	12 (11.8)
Lip treatment	36 (35.3)
Nose treatment	30 (29.4)
Cheek treatment	26 (25.5)
Eye-region treatment	18 (17.6)
Forehead treatment	8 (7.8)
Jaw/chin treatment	6 (5.9)
Neck treatment	5 (4.9)

The procedure profile confirms that the cohort was not restricted to conventionally defined non-invasive facial treatments.

Table 3. Post-Treatment Outcomes

Outcome	n (%)
No complication	63 (61.8)
Asymmetry	11 (10.8)
Scar	7 (6.9)
Infection	13 (12.7)
Wound infection	8 (7.8)
Any complication	39 (38.2)
Pain	38 (37.3)
Swelling	32 (31.4)
Redness	32 (31.4)
Emergency-department visit	35 (34.3)
Contacted/visited specialist before scheduled follow-up	67 (65.7)

Satisfaction

Fifty-seven participants were very satisfied, five were satisfied, six were neutral, and 34 were dissatisfied. The combined satisfied/very-satisfied proportion was therefore 62/102 (60.8%).

Table 4. Satisfaction and Future Treatment Intention

Variable	Category	n (%)
Satisfaction	Very satisfied	57 (55.9)
	Satisfied	5 (4.9)
	Neutral	6 (5.9)
	Dissatisfied	34 (33.3)
Duration of reported satisfaction	<1 month	5 (4.9)
	3–6 months	35 (34.3)
	>6 months	5 (4.9)
	Still satisfied	57 (55.9)
Would undergo procedure again	Definitely yes	54 (52.9)
	Probably yes	17 (16.7)
	Unsure	15 (14.7)
	Probably no	10 (9.8)
	Definitely no	6 (5.9)

Payment and Recommendation

Sixty-one participants (59.8%) self-funded their procedure, seven (6.9%) relied on a guardian, five (4.9%) on a husband, six (5.9%) on one or both parents, and 23 (22.5%) reported multiple payment sources. Sixty-seven participants (65.7%) stated that they would recommend treatment to others.

Complications and Post-Treatment Symptoms

Sixty-three participants (61.8%) reported no complication. Thirty-nine participants (38.2%) reported at least one categorized complication, comprising asymmetry, scar, infection, or wound infection. Pain was reported by 38 participants, swelling by 32, and redness by 32. Thirty-five participants reported an emergency-department visit and 67 reported contacting or visiting a specialist before their scheduled follow-up.

Complications and Satisfaction

Among participants without complications, 55/63 (87.3%) were satisfied or very satisfied. Among participants reporting any complication, only 7/39 (17.9%) were satisfied or very satisfied.

Table 5. Selected Binary Associations

Association	Comparison	Effect Estimate
No complication vs any complication and positive satisfaction	55/63 vs 7/39	OR 31.43 (95% CI 10.42–94.80), Fisher p<0.001
Any complication vs none and emergency attendance	32/39 vs 3/63	OR 91.43 (22.12–377.85), p<0.001
Unknown provider specialty vs known dermatologist/plastic surgeon and any complication	33/35 vs 6/67	OR 167.75 (32.04–878.23), p<0.001
Any complication vs none and specialist contact before scheduled follow-up	6/39 vs 61/63	OR 0.006 (0.001–0.031), p<0.001

Specialist contact before scheduled follow-up was reported by 61/63 participants without complications compared with only 6/39 participants with complications. Thus, the observed direction of association was opposite to an interpretation that participants experiencing complications were more likely to report early specialist contact.

Age was not significantly associated with the detailed complication categories, $\chi^2(12)=16.30$, p=.178. Provider-specialty category showed a strong association with complication category, $\chi^2=74.50$, p<.001, although several expected cell counts were small.

Most procedure-specific analyses did not demonstrate statistically significant associations with complication categories. A significant association was observed for nose treatment (p=.006), while the result for neck treatment was borderline (p=.071). These exploratory comparisons were not adjusted for multiple testing.

DISCUSSION

Approximately three-fifths of participants were satisfied or very satisfied with their cosmetic treatment, while one-third were dissatisfied. The most pronounced association in the dataset was between absence of complications and positive satisfaction: 87.3% of participants without complications were satisfied or very satisfied compared with 17.9% of those reporting complications. Complications were also strongly associated with emergency-department attendance. Provider-specialty awareness showed a large unadjusted association with reported complications, although the magnitude of this association requires cautious interpretation because of the observational design, small cells, and absence of multivariable adjustment.

The relationship between complications and satisfaction is clinically plausible and consistent with contemporary aesthetic-treatment literature. National studies of non-invasive facial treatments and facial filling procedures have reported generally favorable satisfaction but have also shown that treatment experience and adverse outcomes contribute importantly to patients' evaluations of their procedures (5,6). Satisfaction is multidimensional and may reflect perceived aesthetic improvement, pain or discomfort, adverse effects, durability of the result, expectations, and psychosocial response rather than technical outcome alone (7,8). The large difference in satisfaction between participants with and without complications in the present study therefore accords with the broader concept that avoidance and effective management of adverse effects are integral to patient-perceived treatment success.

The complication burden observed in this cohort deserves particular attention. Systematic evidence on hyaluronic-acid fillers indicates that most adverse events are mild and transient, but clinically important complications can occur and may require active intervention (9). Broader evidence across nonsurgical facial aesthetic procedures similarly demonstrates that risk profiles vary according to procedure type, product, anatomical location, and technique (10). Botulinum toxin is generally well tolerated in aesthetic use, yet adverse events remain documented and can affect treatment experience and satisfaction (11).

Thread lifting introduces another pattern of complications, including swelling, bruising, contour irregularity, dimpling, infection, and thread-related problems (12). These differences emphasize that a single undifferentiated complication variable can conceal clinically important variation between aesthetic modalities.

The procedural composition of the present cohort is therefore an important consideration. Liposuction was reported by 93.1% of participants and fat injection by 76.5%, while 19.6% reported facial or nasal thread procedures. These interventions should not be described collectively as purely non-invasive cosmetic treatments. Facial fat grafting requires adipose-tissue harvesting followed by transplantation and has recognized donor-site and recipient-site risks, including rare but severe vascular complications (13,14,16). Thread procedures involve tissue penetration and mechanical suspension and have a complication profile distinct from topical or device-based non-invasive treatments (12). Liposuction is an operative adipose-tissue removal procedure; contemporary studies and systematic reviews report generally high satisfaction in appropriately selected patients but nevertheless document complications including contour irregularity, seroma, fibrosis, infection, and other procedure-related adverse outcomes (21,22). The present cohort is therefore better characterized as a heterogeneous aesthetic-procedure population than as a uniform non-invasive treatment group.

The emergency-care findings further support careful evaluation of procedural safety. Approximately one-third of the complete cohort reported an emergency-department visit, and such attendance occurred in 32/39 participants with complications compared with only 3/63 participants without complications. Although many adverse effects after injectables are self-limited, systematic reviews also identify uncommon but potentially serious filler-related vascular and ocular complications that require rapid recognition and management (9,15). Severe ophthalmic complications have likewise been reported following facial autologous fat injection (16). The high emergency-attendance frequency in the present dataset is therefore clinically important, but interpretation depends on what participants understood by an “emergency-department visit,” when that visit occurred, and whether it was directly attributable to the cosmetic procedure. Future studies should define the timing, indication, healthcare setting, and clinical outcome of post-procedure urgent-care encounters more precisely.

Provider specialty also demonstrated a pronounced association with complications. Thirty-three of 35 participants who did not know their clinician's specialty reported a complication, compared with six of 67 participants who identified the provider as a dermatologist or plastic/reconstructive surgeon. Appropriate anatomical knowledge, patient selection, product selection, injection technique, recognition of adverse events, and complication management are repeatedly emphasized in the aesthetic safety literature (9,10,15). Nevertheless, the present unadjusted association cannot establish that provider specialty itself caused the observed difference. Awareness of provider credentials may be associated with clinic setting, procedure type, patient education, complexity of treatment, socioeconomic factors, recall, referral patterns, or other unmeasured characteristics. In addition, the extremely large OR and sparse cells raise the possibility of instability, selection effects, or classification problems. The finding should therefore be interpreted as a signal requiring confirmation rather than as a causal estimate.

The specialist-contact variable illustrates another reason for cautious interpretation of questionnaire-derived associations. Contact with or visits to a specialist before scheduled follow-up were reported by 61/63 participants without complications but only 6/39 participants with complications. Consequently, the observed data do not support an interpretation that participants with complications were more likely to obtain early specialist consultation. The variable may instead reflect routine communication practices, differences in how respondents interpreted “specialist contact,” or questionnaire coding. Its meaning should be verified in future data collection before conclusions are drawn regarding the effect of follow-up contact on clinical outcome.

Psychosocial characteristics also deserve attention when satisfaction after aesthetic procedures is investigated. Social-media exposure has been associated with body-image concerns and consideration of cosmetic procedures, although the underlying evidence is heterogeneous and predominantly observational (17). More recent work has examined filtered self-images and online appearance exposure in relation to body-image perception and post-procedure satisfaction (20). At the same time, systematic reviews indicate that body dysmorphic disorder is more prevalent among populations seeking cosmetic treatment than would be expected in general community samples, although estimates vary by setting and screening instrument (18,19). The current questionnaire did not measure these constructs directly. Future studies of satisfaction in aesthetic-clinic populations would therefore benefit from incorporating

validated measures of expectations, appearance-related psychosocial functioning, and appropriate psychological screening where clinically indicated.

The present study used a simple categorical satisfaction question, which enabled straightforward description but limited measurement precision. The FACE-Q Aesthetics instruments provide validated scales for satisfaction with facial appearance, health-related quality of life, treatment outcomes, and adverse effects and permit more standardized comparison across aesthetic interventions (1–4). Their use would be particularly valuable in a heterogeneous cohort because separate domains can distinguish satisfaction with appearance from satisfaction with care, psychological well-being, and treatment-related adverse effects. Standardized patient-reported outcome measurement would also reduce reliance on a single global satisfaction category and improve comparability with international aesthetic-outcomes research.

The study title and analytical interpretation must also reflect the statistical design. Although several large associations were observed, the analyses were descriptive and bivariate. An independent predictor requires an appropriately specified multivariable model capable of estimating associations while accounting for relevant confounding and the available sample size. For example, the apparent relationship between provider specialty and complications could be influenced by procedure type, treatment setting, education, previous treatment history, and other measured or unmeasured characteristics. Cross-sectional observational studies also have inherent limitations for establishing temporality and causality, and reporting should clearly distinguish association from prediction or causal inference (23). Accordingly, the present findings identify associated factors rather than independent predictors.

Several additional limitations should be considered. Recruitment was purposive, the study was restricted to adults aged 20–40 years from clinics in Punjab, and women constituted 83.3% of the sample; these characteristics limit generalizability to broader aesthetic-treatment populations. The income variable showed no variability, preventing analysis of socioeconomic gradients. Procedures with markedly different mechanisms and invasiveness were combined within the same dataset, while individual participants could report more than one procedure or treatment region, complicating attribution of a reported complication to a specific intervention. Complications, emergency visits, provider specialty, and satisfaction were questionnaire-based and therefore potentially affected by recall or classification error. Several contingency-table cells were small, resulting in extremely large ORs with wide confidence intervals. In addition, numerous exploratory procedure-specific comparisons were performed without adjustment for multiple testing. Most importantly, the absence of multivariable modelling prevents separation of independent associations from confounding. These limitations warrant cautious interpretation of effect sizes despite the strong statistical significance of several bivariate comparisons.

Despite these limitations, the study provides clinically relevant information on satisfaction, complications, healthcare use, and provider-related variables in a Pakistani aesthetic-clinic population. The strong relationship between complication status and satisfaction indicates that patient-reported outcome research in aesthetic medicine should evaluate safety and satisfaction together rather than treating them as independent domains. Future studies should prospectively define procedure categories, distinguish non-invasive, minimally invasive, and surgical interventions, record the temporal relationship between each procedure and each complication, use validated FACE-Q measures, assess relevant psychosocial characteristics, and apply appropriately specified multivariable models when the sample size and distribution of outcomes permit.

CONCLUSION

Approximately three-fifths of participants reported being satisfied or very satisfied with their cosmetic treatment. Absence of post-treatment complications showed the clearest association with positive satisfaction, while complications were strongly associated with emergency-care use. Provider-specialty awareness also showed a substantial unadjusted relationship with complication status, although the magnitude and causal meaning of this association cannot be established from the present cross-sectional data.

The available analyses demonstrate associations rather than independent predictors because no adjusted multivariable model was performed. In addition, the cohort included liposuction, fat injection, and thread procedures and therefore should not be interpreted as a uniform population receiving exclusively non-invasive facial treatments. Future research should use clear procedural classification,

validated patient-reported outcome measures, rigorous complication definitions, appropriately timed follow-up, psychosocial assessment where relevant, and multivariable statistical analysis.

REFERENCES

1. Ottenhof MJ, Veldhuizen IJ, Hensbergen LJV, Blankensteijn LL, Bramer W, van der Lei B, et al. The use of the FACE-Q Aesthetic: a narrative review. Aesthetic Plast Surg. 2022;46(6):2769–2780. doi:10.1007/s00266-022-02974-9.
2. Pusic AL, Klassen AF, Scott AM, Cano SJ. Development and psychometric evaluation of the FACE-Q satisfaction with appearance scale: a new patient-reported outcome instrument for facial aesthetics patients. Clin Plast Surg. 2013;40(2):249–260. doi:10.1016/j.cps.2012.12.001.
3. Klassen AF, Cano SJ, Schwitzer JA, Scott AM, Pusic AL. FACE-Q scales for health-related quality of life, early life impact, satisfaction with outcomes, and decision to have treatment: development and validation. Plast Reconstr Surg. 2015;135(2):375–386. doi:10.1097/PRS.0000000000000895.
4. Klassen AF, Cano SJ, Schwitzer JA, Baker SB, Carruthers A, Carruthers J, et al. Development and psychometric validation of the FACE-Q skin, lips, and facial rhytids appearance scales and adverse effects checklists for cosmetic procedures. JAMA Dermatol. 2016;152(4):443–451. doi:10.1001/jamadermatol.2016.0018.
5. Alenazi NF, AlBattal NZ, Albalawi IAS, Saleh NA, Alnaim MF, Bin Mahmoud AZ, et al. Rate and predictors of satisfaction after noninvasive facial cosmetic procedures: a national study in Saudi Arabia. Plast Reconstr Surg Glob Open. 2024;12(2). doi:10.1097/GOX.0000000000005607.
6. Al-Atif HM, Alqarni AM, Almuntashiri AA, Almuntashiri AS, Almarhabi MA. Satisfaction among recipients of cosmetic facial filling procedures at dermatology clinics in Saudi Arabia: a national study. Clin Cosmet Investig Dermatol. 2024;17:2465–2474. doi:10.2147/CCID.S470437.
7. Hoffman L, Fabi S. Look better, feel better, live better? The impact of minimally invasive aesthetic procedures on satisfaction with appearance and psychosocial wellbeing. J Clin Aesthet Dermatol. 2022;15(5):47–58.
8. Bulegon A, Sebben V, Rigo L. Assessment of pain and satisfaction after orofacial harmonization procedures. Aesthetic Plast Surg. 2025;49(3):607–617. doi:10.1007/s00266-024-04348-9.
9. Kyriazidis I, Spyropoulou GA, Zambacos G, Tagka A, Rakhorst HA, Gasteratos K, et al. Adverse events associated with hyaluronic acid filler injection for non-surgical facial aesthetics: a systematic review of high level of evidence studies. Aesthetic Plast Surg. 2024;48(4):719–741. doi:10.1007/s00266-023-03465-1.
10. Sousa Cruz VM, Sousa-Neto SS, Pedroso CM, Pérez-de-Oliveira ME, Normando AGC, Bezerra HKF, et al. Adverse events in nonsurgical facial aesthetic procedures: a systematic review and meta-analysis. Oral Dis. 2026;32(2):384–394. doi:10.1111/odi.70109.
11. Jia Z, Lu H, Yang X, Jin X, Wu R, Zhao J, et al. Adverse events of botulinum toxin type A in facial rejuvenation: a systematic review and meta-analysis. Aesthetic Plast Surg. 2016;40(5):769–777. doi:10.1007/s00266-016-0682-1.
12. Niu Z, Zhang K, Yao W, Li Y, Jiang W, Zhang Q, et al. A meta-analysis and systematic review of the incidences of complications following facial thread-lifting. Aesthetic Plast Surg. 2021;45(5):2148–2158. doi:10.1007/s00266-021-02256-w.
13. Schiraldi L, Sapino G, Meuli J, Maruccia M, Cherubino M, Raffoul W, et al. Facial fat grafting (FFG): worth the risk? A systematic review of complications and critical appraisal. J Clin Med. 2022;11(16):4708. doi:10.3390/jcm11164708.
14. Brucato D, Ülgür II, Alberti A, Weinzierl A, Harder Y. Complications associated with facial autologous fat grafting for aesthetic purposes: a systematic review of the literature. Plast Reconstr Surg Glob Open. 2024;12(1). doi:10.1097/GOX.0000000000005538.
15. Mortada H, Seraj H, Barasain O, Bamakhrama B, Alhindi NI, Arab K. Ocular complications post-cosmetic periocular hyaluronic acid injections: a systematic review. Aesthetic Plast Surg. 2022;46(2):760–773. doi:10.1007/s00266-021-02730-5.
16. Mortada H, Seraj H, Alhamoud MA, Alghoribi RS, Alsuhaibani OS, Khoshhal MS, et al. Ophthalmic complications following facial autologous fat graft injection: a systematic review and meta-analysis. Aesthetic Plast Surg. 2022;46(6):3013–3035. doi:10.1007/s00266-022-02924-5.

17. Mironica A, Popescu CA, George D, Tegzeșiu AM, Gherman CD. Social media influence on body image and cosmetic surgery considerations: a systematic review. Cureus. 2024;16(7). doi:10.7759/cureus.65626.
18. Salari N, Kazeminia M, Heydari M, Darvishi N, Ghasemi H, Shohaimi S, et al. Body dysmorphic disorder in individuals requesting cosmetic surgery: a systematic review and meta-analysis. J Plast Reconstr Aesthet Surg. 2022;75(7):2325–2336. doi:10.1016/j.bjps.2022.04.098.
19. Kaleeny JD, Janis JE. Body dysmorphic disorder in aesthetic and reconstructive plastic surgery—a systematic review and meta-analysis. Healthcare (Basel). 2024;12(13):1333. doi:10.3390/healthcare12131333.
20. Abualhaj S, Abualhaj MM, Alshadfan L, Alzayadneh I, Masadeh NM, Abu Nasrieh D, et al. Clinical and psychological impacts of social media and filtered self-images on body image perception and patient satisfaction following aesthetic procedures among Jordanian women: a cross-sectional study. Aesthetic Plast Surg. 2026 Sep 3. doi:10.1007/s00266-026-05972-3.
21. Willet JW, Alvaro AI, Ibrahim AK, Javed MU. A systematic review of efficacy and complications of high-definition liposuction. Plast Reconstr Surg. 2023;152(1):57–63. doi:10.1097/PRS.0000000000010203.
22. Tran BNN, Didzbalis CJ, Chen T, Shulzhenko NO, Asaadi M. Safety and efficacy of third-generation ultrasound-assisted liposuction: a series of 261 cases. Aesthetic Plast Surg. 2022;46(5):2310–2318. doi:10.1007/s00266-022-02992-7.
23. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP; STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Lancet. 2007;370(9596):1453–1457. doi:10.1016/S0140-6736(07)61602-X.