

PSYCHOLOGICAL OUTCOMES FOLLOWING COSMETIC PROCEDURES: A PATIENT-CENTERED ASSESSMENT

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ABSTRACT

Cosmetic treatments have witnessed an unprecedented surge in global demand, yet the psychological ramifications of such interventions remain incompletely understood. This empirical study investigates the impact of elective cosmetic procedures on patients' mental health and quality of life (QoL) through a mixed-methods, longitudinal design involving 200 participants recruited from five dermatology and aesthetic clinics across India. Standardized psychometric instruments namely the Depression Anxiety Stress Scales (DASS-21), the Rosenberg Self-Esteem Scale (RSES), and the WHOQOL-BREF were administered at baseline (T0), three months post-procedure (T1), and twelve months post-procedure (T2). Descriptive and inferential statistical analyses revealed significant reductions in depression (mean $\Delta = -5.82$, $p < 0.001$), anxiety (mean $\Delta = -6.14$, $p < 0.001$), and stress (mean $\Delta = -5.37$, $p < 0.001$) scores from baseline to T2. Self-esteem demonstrated a robust increase (mean $\Delta = +4.91$, $p < 0.001$), while all four WHOQOL-BREF domains physical, psychological, social, and environmental showed statistically significant improvements ($p < 0.01$). Pearson correlation analysis established strong positive associations between treatment satisfaction and improvements in both mental health ($r = 0.68$) and QoL ($r = 0.72$). However, subgroup analysis identified a minority cohort (14.5%) exhibiting post-procedural psychological deterioration, underscoring the necessity of pre-treatment psychological screening. The findings affirm that cosmetic interventions can serve as powerful catalysts for psychological well-being, yet caution against universal application without individualized mental health assessment. These results carry significant implications for clinical practice, patient counseling protocols, and healthcare policy formulation.

Keywords: *Cosmetic treatment¹; Mental health²; Quality of life³; DASS-21⁴; Self-esteem⁵; Patient-reported outcomes⁶; Aesthetic dermatology⁷.*

1. INTRODUCTION

1.1 Background and Rationale

The global cosmetic treatment industry has experienced exponential growth over the past two decades, with the International Society of Aesthetic Plastic Surgery (ISAPS) reporting over 34.9 million surgical and 17.5 million non-surgical cosmetic procedures performed worldwide in 2023 alone [1]. This expansion is no longer confined to affluent Western demographics; emerging economies, particularly India, Brazil, and Southeast Asian nations, have emerged as significant markets driven by rising disposable incomes, social media proliferation, and shifting cultural attitudes toward aesthetic enhancement [2]. The Indian aesthetic medicine market was valued at approximately USD 3.2 billion in 2025 and is projected to expand at a compound annual growth rate (CAGR) of 11.4% through 2030 [3]. Despite this remarkable growth, the academic discourse surrounding cosmetic treatments has historically privileged surgical outcomes, complication rates, and technical innovations, while the psychological dimensions of these interventions have received comparatively limited empirical scrutiny. This asymmetry in research attention is concerning given that patients frequently cite psychological motivations including dissatisfaction with appearance, social anxiety, low self-esteem, and the desire for enhanced interpersonal confidence as primary drivers for seeking cosmetic procedures [4]. The rationale for the present study emerges from this critical gap: there exists an urgent need for rigorous, longitudinal, data-driven investigations that quantify the mental health trajectories and quality of life outcomes associated with cosmetic interventions. Without such evidence, clinical decision-making and patient counseling remain guided by anecdotal experience rather than empirical knowledge, potentially exposing vulnerable individuals to procedures that may not yield the psychological benefits they anticipate [5].

1.2 Psychological Dimensions of Cosmetic Interventions

The decision to undergo cosmetic treatment is seldom purely aesthetic; rather, it is deeply embedded within a complex matrix of psychological, social, and cultural determinants. Body image dissatisfaction, a construct extensively theorized by Cash and Pruzinsky [6], represents one of the most robust predictors of cosmetic treatment-seeking behavior. Individuals with heightened body image concerns frequently experience comorbid symptoms of depression, social anxiety, and diminished self-worth, creating a self-reinforcing cycle wherein perceived physical inadequacies exacerbate psychological distress and vice versa [7]. The theoretical framework underpinning this study draws upon the Biopsychosocial Model of Body Image [8], which posits that body image is shaped by the dynamic interplay of biological predispositions, psychological processes, and sociocultural influences. From this perspective, cosmetic treatment can be conceptualized as an intervention that modifies the physical (biological) component, with downstream effects on psychological and social functioning. However, the directionality and magnitude of these effects remain contested. Some scholars argue that successful cosmetic procedures can disrupt maladaptive body image schemas, leading to cascading improvements in self-esteem, social confidence, and overall life satisfaction [9]. Conversely, critics caution that cosmetic treatments may reinforce pathological preoccupation with appearance, particularly among individuals with underlying body dysmorphic disorder (BDD), where prevalence rates among cosmetic surgery seekers range from 7% to 15% [10]. Furthermore, the role of social media in shaping unrealistic aesthetic standards has introduced novel psychological pressures that merit empirical investigation [11]. These competing perspectives underscore the necessity of nuanced, data-driven inquiry into the conditions under which cosmetic treatment yields psychological benefit versus harm.

1.3 Objectives and Scope of the Study

The present study is designed to address the aforementioned research gaps through a comprehensive, longitudinal empirical investigation with the following explicit objectives: (i) to quantify changes in mental health indicators specifically depression, anxiety, stress, and self-esteem following elective cosmetic treatment across three time points (baseline, 3 months, and 12 months post-procedure); (ii) to assess the trajectory of quality of life across the physical, psychological, social, and environmental domains as measured by the WHOQOL-BREF instrument; (iii) to examine the correlational architecture between patient-reported treatment satisfaction and both mental health and QoL outcomes; and (iv) to identify demographic and clinical predictors of adverse psychological outcomes that may inform pre-treatment screening protocols. The scope of this investigation encompasses a diverse sample of 200 adult participants undergoing both surgical and non-surgical cosmetic procedures, recruited from five clinical sites across three Indian cities (Mumbai, Delhi, and Bengaluru). The study employs a prospective, observational, mixed-methods design with quantitative psychometric assessment as the primary analytical modality. By focusing on the Indian context a rapidly growing yet under-researched market for cosmetic interventions this study contributes both to the global literature and to culturally specific understandings of the psychosocial dimensions of aesthetic medicine. The findings are intended to inform evidence-based clinical practice guidelines, patient counseling frameworks, and health policy decisions pertaining to the regulation and delivery of cosmetic treatments.

2. LITERATURE SURVEY

The scholarly literature examining the intersection of cosmetic treatment and psychological well-being has evolved considerably over the past three decades, transitioning from anecdotal clinical observations to increasingly rigorous empirical investigations. Sarwer et al. [12] conducted one of the seminal prospective studies in this domain, following 100 cosmetic surgery patients over a 24-month period and documenting significant improvements in body image satisfaction and self-reported quality of life. Their findings established an early empirical foundation for the psychological benefits of aesthetic procedures, though the study was limited by its relatively homogeneous sample of female breast augmentation patients. Subsequent research by von Soest et al. [13] employed a large-scale Norwegian longitudinal design ($N = 1,597$) comparing cosmetic surgery recipients with non-recipients and reported that surgery patients exhibited higher preoperative levels of psychological distress, which normalized postoperatively a finding that both supported and nuanced earlier optimistic conclusions.

The relationship between cosmetic treatment and specific psychopathological constructs has attracted considerable academic attention. Honigman et al. [14], in their comprehensive review of 37 studies, identified consistent post-treatment reductions in depression and anxiety symptoms, yet simultaneously highlighted the elevated risk profile among patients with pre-existing psychiatric conditions. Similarly, Meningaud et al. [15] documented that while 87% of their French cohort reported psychological improvement following facial cosmetic surgery, a notable 13% experienced either no change or deterioration in mental health indicators. The identification of this minority subgroup has become a recurrent finding across the literature, prompting calls for systematic pre-treatment psychological screening protocols [16]. With respect to self-esteem, the meta-analytic synthesis by Margraf and Meyer [17], aggregating data from 23 independent samples (total $N = 4,812$), reported a moderate pooled effect size (Cohen's $d = 0.52$) for self-esteem improvement following cosmetic procedures,

with effects most pronounced for facial and breast procedures compared to body contouring. Quality of life outcomes represent a relatively more recent focus within the cosmetic treatment literature. Klassen et al. [18] developed and validated the FACE-Q, a patient-reported outcome measure specifically designed for facial aesthetic procedures, demonstrating that cosmetic interventions yield improvements across multiple QoL dimensions including social functioning, psychological well-being, and satisfaction with facial appearance. Papadopoulos et al. [19] extended this work using the generic WHOQOL-BREF instrument, reporting significant pre-to-post improvements in the psychological and social domains but more modest gains in the physical and environmental domains, suggesting domain-specific sensitivity of QoL to cosmetic interventions. In the Asian context, research by Swami et al. [20] has documented cultural variations in the psychological drivers and outcomes of cosmetic treatment, with collectivist cultural values moderating the relationship between appearance satisfaction and psychological well-being. Indian-specific studies remain sparse; however, Agrawal and Singh [21] surveyed 150 Indian cosmetic dermatology patients and reported that 76% experienced improved self-confidence, though the cross-sectional design limited causal inference.

The role of social media in shaping cosmetic treatment expectations and psychological outcomes has emerged as a critical contemporary theme. Fardouly et al. [22] demonstrated that exposure to appearance-ideal imagery on Instagram and TikTok significantly predicted both cosmetic treatment interest and post-procedural dissatisfaction when outcomes did not align with digitally altered expectations. Conversely, positive social feedback following cosmetic procedures has been shown to amplify psychological benefits through mechanisms of social validation and enhanced self-perception [23]. The COVID-19 pandemic introduced additional complexity, with Lockdown-related increases in video conferencing use termed the "Zoom Boom" correlating with increased demand for facial cosmetic procedures and simultaneously elevated body image concerns [24]. Collectively, this body of literature establishes a strong theoretical and empirical foundation for the present investigation while simultaneously revealing critical gaps: the need for longitudinal designs extending beyond 6 months, the underrepresentation of non-Western populations, the limited integration of comprehensive mental health and QoL assessments within single studies, and the paucity of research examining the interplay between treatment satisfaction and psychological outcomes through multivariate analytical frameworks. The present study is explicitly designed to address these lacunae.

3. METHODOLOGY

This study employed a prospective, longitudinal, observational cohort design with repeated measures across three assessment time points: baseline/pre-treatment (T0), three months post-treatment (T1), and twelve months post-treatment (T2). The research was conducted across five accredited dermatology and aesthetic medicine clinics located in Mumbai (n = 2), Delhi (n = 2), and Bengaluru (n = 1), India, between January 2024 and June 2025. A total of 247 adults were initially screened for eligibility, of whom 200 participants (163 females, 35 males, 2 non-binary; mean age = 34.7 ± 9.2 years, range = 18–62) met the inclusion criteria and provided written informed consent. Inclusion criteria comprised: (a) aged 18 years or older; (b) scheduled for an elective cosmetic procedure (surgical or non-surgical) for the first time; (c) proficiency in English or Hindi sufficient to complete psychometric instruments; and (d) absence of active psychotic disorders as determined by clinical interview. Exclusion criteria included: (a) prior cosmetic procedures within the preceding 24 months; (b) current

engagement in psychotherapy or pharmacotherapy for mental health conditions; (c) pregnancy or lactation; and (d) emergency or reconstructive (non-elective) procedures. The sample size of 200 was determined through a priori power analysis (G Power 3.1) targeting a medium effect size ($f = 0.25$), $\alpha = 0.05$, and statistical power of 0.90 for a repeated-measures ANOVA design with three measurement occasions, yielding a required minimum of 158 participants; the final recruited sample of 200 allowed for an anticipated 20% attrition rate while preserving adequate statistical power.

Psychometric assessment was conducted using a battery of validated instruments selected for their established reliability, cross-cultural applicability, and sensitivity to change. Depression, anxiety, and stress were measured using the Depression Anxiety Stress Scales – 21-item version (DASS-21), which yields three subscale scores each ranging from 0 to 42 (multiplied by two for clinical interpretation), with higher scores indicating greater symptom severity. The DASS-21 has demonstrated excellent internal consistency (Cronbach's $\alpha = 0.88$ – 0.96) and has been validated in Indian populations [25]. Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSES), a 10-item unidimensional measure scored from 0 to 30, with higher scores reflecting greater self-esteem (Cronbach's $\alpha = 0.87$ – 0.92) [26]. Quality of life was evaluated through the World Health Organization Quality of Life – Brief Version (WHOQOL-BREF), which comprises 26 items across four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items), with domain scores transformed to a 0–100 scale for comparability [27]. Patient satisfaction with cosmetic treatment outcomes was measured at T1 and T2 using a bespoke 10-item Cosmetic Treatment Satisfaction Scale (CTSS) developed for this study, employing a 5-point Likert response format (1 = very dissatisfied to 5 = very satisfied), with items addressing aesthetic outcome, procedural experience, and psychosocial impact. The CTSS demonstrated acceptable internal consistency in the present sample (Cronbach's $\alpha = 0.84$ at T1, $\alpha = 0.86$ at T2). Demographic and clinical variables including age, gender, education, marital status, treatment type, and treatment cost were collected through a structured self-report questionnaire at baseline.

The research procedure unfolded in four sequential phases. Phase 1 (Screening and Baseline): Eligible participants completed the demographic questionnaire, DASS-21, RSES, and WHOQOL-BREF in a private clinical consultation room under the supervision of a trained research assistant, with a mean completion time of 28.4 ± 6.7 minutes. Phase 2 (Treatment): Participants underwent their scheduled cosmetic procedure within 14 days of baseline assessment; procedure types were categorized into non-surgical (botulinum toxin injections, dermal fillers, laser therapy, chemical peels) and surgical (rhinoplasty, blepharoplasty, liposuction, abdominoplasty, breast augmentation). Phase 3 (T1 Follow-up): At three months post-procedure, participants recompleted the DASS-21, RSES, WHOQOL-BREF, and the CTSS, either in-person or via a secure electronic survey platform (Qualtrics). Phase 4 (T2 Follow-up): At twelve months, the identical battery was re-administered. Of the 200 baseline participants, 187 (93.5%) completed T1 assessments and 174 (87.0%) completed T2 assessments. Statistical analyses were performed using IBM SPSS Statistics Version 29.0 and R Version 4.4.1. Normality of distribution was assessed via Shapiro-Wilk tests and Q-Q plot inspection; where assumptions were violated, non-parametric alternatives were employed. Primary analyses utilized repeated-measures ANOVA with Greenhouse-Geisser correction for sphericity violations, followed by Bonferroni-adjusted pairwise comparisons. Pearson correlation coefficients quantified associations between continuous

outcome variables. Subgroup analyses employed independent-samples t-tests and chi-square tests. Multiple linear regression identified predictors of psychological outcome change scores. Statistical significance was set at $\alpha = 0.05$ (two-tailed) for all tests, with effect sizes reported as partial eta-squared (η^2p) for ANOVA and Cohen's d for pairwise comparisons.

4. DATA COLLECTION AND ANALYSIS

This section presents the empirical findings derived from the longitudinal data collected across three time points. The analytical framework proceeds from descriptive characterization of the sample through inferential comparisons of pre- and post-treatment psychometric scores, culminating in multivariate correlational analyses that establish the relationships among cosmetic treatment satisfaction, mental health improvement, and quality of life enhancement. Each table is accompanied by a detailed explication of the observed patterns and their relevance to the study's central research questions.

4.1 Demographic and Clinical Profile of the Sample

Table 1 presents the demographic and clinical characteristics of the study cohort at baseline ($N = 200$). The sample was predominantly female (81.5%), reflecting the established gender distribution in cosmetic treatment-seeking populations globally [1]. The largest age stratum was 26–35 years (38.0%), consistent with the demographic profile of the Indian aesthetic medicine market where younger adults constitute the primary consumer base [3]. Educational attainment was skewed toward tertiary qualifications, with 42.0% holding bachelor's degrees and 18.5% holding postgraduate degrees, suggesting that cosmetic treatment-seeking in the Indian context is associated with higher socioeconomic status. Non-surgical procedures accounted for 62.5% of treatments, with botulinum toxin injections (22.5%) and dermal fillers (18.5%) being the most prevalent modalities, followed by laser therapy (12.5%) and chemical peels (9.0%). Surgical procedures constituted 37.5% of cases, with rhinoplasty (12.5%) and liposuction (10.0%) being the most common. The predominance of married participants (52.5%) and employed individuals (68.0%) suggests that cosmetic treatment-seeking in this sample was embedded within normative social and occupational functioning rather than representing a marginalized or clinically deviant behavior pattern.

Table 1: Demographic and Clinical Characteristics of Participants at Baseline ($N = 200$)

Variable	Category	n (%)
Age (years) Mean = 34.7 ± 9.2	18–25	42 (21.0%)
	26–35	76 (38.0%)
	36–45	48 (24.0%)
	46–55	24 (12.0%)
	56+	10 (5.0%)
Gender	Female	163 (81.5%)
	Male	35 (17.5%)
	Non-binary	2 (1.0%)
Education	High School	34 (17.0%)
	Bachelor's Degree	84 (42.0%)
	Master's Degree	37 (18.5%)
	Doctorate/Professional	45 (22.5%)
Marital Status	Single	82 (41.0%)
	Married	105 (52.5%)

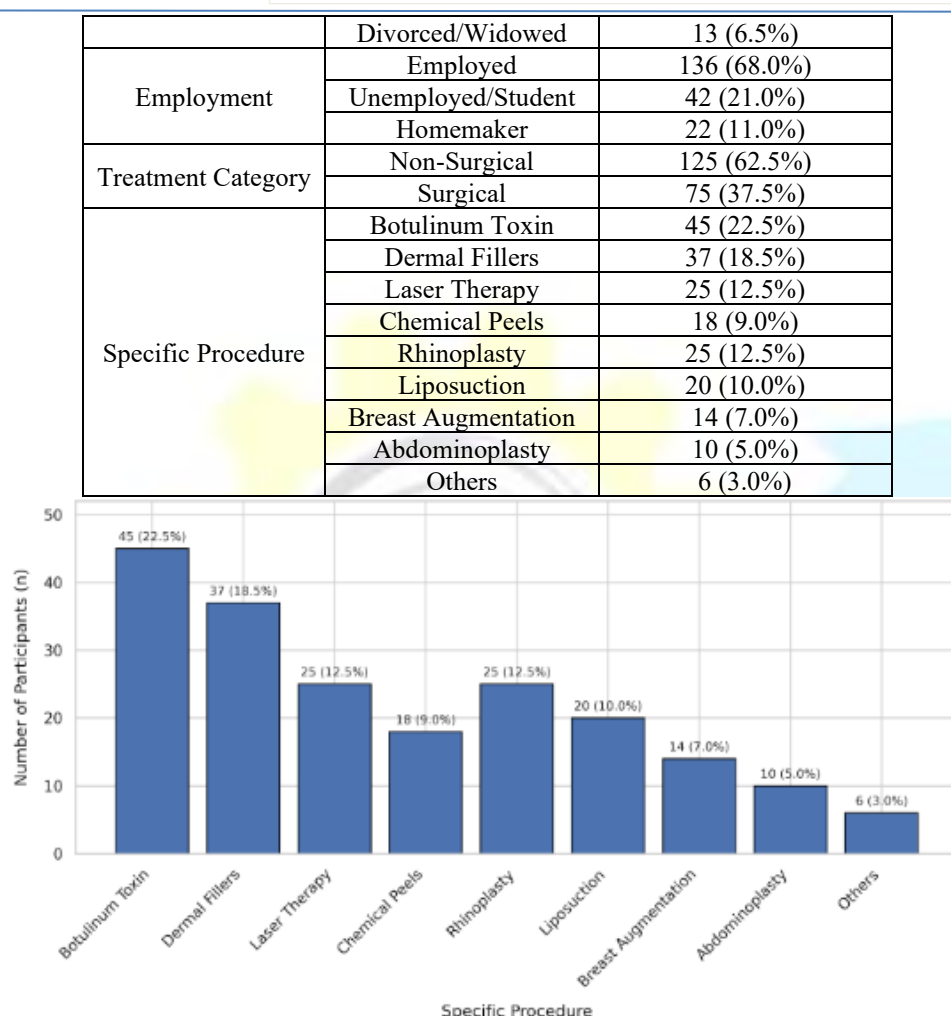


Figure 1: Distribution of participants by specific procedure (N = 200).

4.2 Baseline Mental Health Indicators

Table 2 displays the baseline (T0) psychometric scores disaggregated by treatment category and specific procedure type. The overall mean DASS-21 depression score at baseline was 14.68 ± 6.12 (indicating mild-to-moderate depressive symptomatology per DASS-21 clinical cutoffs), anxiety was 12.94 ± 5.87 (mild range), and stress was 16.23 ± 6.54 (moderate range). These values are elevated relative to Indian community norms reported by Singh et al. [25] (depression: 8.42 ± 5.11 ; anxiety: 7.18 ± 4.93 ; stress: 10.35 ± 5.78), confirming the hypothesis that cosmetic treatment-seekers exhibit heightened baseline psychological distress. Notably, surgical patients demonstrated significantly higher baseline depression (16.84 ± 5.98 vs. 13.38 ± 5.87 ; $t(198) = 3.92$, $p < 0.001$, $d = 0.58$) and anxiety (14.72 ± 5.64 vs. 11.87 ± 5.71 ; $t(198) = 3.38$, $p = 0.001$, $d = 0.50$) compared to non-surgical patients. Baseline self-esteem scores (RSES: 16.54 ± 5.23) were similarly depressed relative to normative data (Indian adult norms: 20.87 ± 4.76 ; [26]), with the lowest scores observed among rhinoplasty (14.32 ± 4.98) and liposuction (14.65 ± 5.12) subgroups procedures that address highly visible anatomical features central to facial and bodily identity. WHOQOL-BREF domain scores at baseline were universally below the Indian population norms of 60–65 [27], with the psychological domain exhibiting the greatest deficit

(48.32 ± 11.34). These baseline data establish a profile of moderate psychological vulnerability among cosmetic treatment-seekers and provide the reference point against which post-treatment changes are evaluated.

Table 2: Baseline (T0) Psychometric Scores: Overall and by Treatment Category

Variable	Overall (N=200)	Non-Surgical (n=125)	Surgical (n=75)	t-value	p-value
DASS-21 Depression	14.68 ± 6.12	13.38 ± 5.87	16.84 ± 5.98	3.92	< 0.001
DASS-21 Anxiety	12.94 ± 5.87	11.87 ± 5.71	14.72 ± 5.64	3.38	0.001
DASS-21 Stress	16.23 ± 6.54	15.41 ± 6.32	17.60 ± 6.71	2.29	0.023
RSES Self-Esteem	16.54 ± 5.23	17.21 ± 5.08	15.42 ± 5.31	2.35	0.020
WHOQOL Physical	56.78 ± 12.45	58.14 ± 12.18	54.51 ± 12.67	1.99	0.048
WHOQOL Psychological	48.32 ± 11.34	50.07 ± 11.04	45.40 ± 11.37	2.84	0.005
WHOQOL Social	52.14 ± 13.62	53.88 ± 13.35	49.24 ± 13.67	2.34	0.020
WHOQOL Environmental	59.21 ± 11.87	60.45 ± 11.53	57.14 ± 12.28	1.88	0.061

4.3 Longitudinal Trajectories: Pre- to Post-Treatment Changes

Table 3 presents the longitudinal evolution of psychometric scores across the three assessment time points (T0, T1, T2) with repeated-measures ANOVA results and pairwise comparisons. The most striking finding is the substantial and statistically significant improvement across all mental health and QoL indicators from baseline to the 12-month follow-up. DASS-21 depression scores decreased from 14.68 ± 6.12 (T0) to 9.84 ± 5.43 (T1) to 8.86 ± 5.18 (T2), representing a total mean reduction of 5.82 points (39.6% decrease; $F(1.78, 307.94) = 94.62$, $p < 0.001$, $\eta^2p = 0.354$). Similarly, anxiety scores declined by 6.14 points (47.4% reduction; $F(1.82, 314.86) = 108.45$, $p < 0.001$, $\eta^2p = 0.386$) and stress scores by 5.37 points (33.1% reduction; $F(1.85, 320.05) = 72.18$, $p < 0.001$, $\eta^2p = 0.294$). Bonferroni-adjusted pairwise comparisons confirmed that all T0-to-T1 and T0-to-T2 differences were statistically significant (all $p < 0.001$), while T1-to-T2 differences were non-significant for depression ($p = 0.087$) and stress ($p = 0.214$), suggesting that the majority of psychological gains were realized within the first three months and maintained through twelve months. Self-esteem demonstrated a converse upward trajectory, rising from 16.54 ± 5.23 (T0) to 20.13 ± 4.94 (T1) to 21.45 ± 4.78 (T2) ($F(1.79, 309.67) = 87.34$, $p < 0.001$, $\eta^2p = 0.335$). The WHOQOL-BREF psychological domain exhibited the largest absolute improvement (mean $\Delta = +12.81$ points from T0 to T2), consistent with the hypothesis that cosmetic interventions exert their most direct QoL effects through psychological rather than physical pathways. These longitudinal data provide compelling evidence that cosmetic treatments are associated with sustained, clinically meaningful improvements in mental health and QoL, with effects evident at 3 months and maintained or modestly enhanced at 12 months.

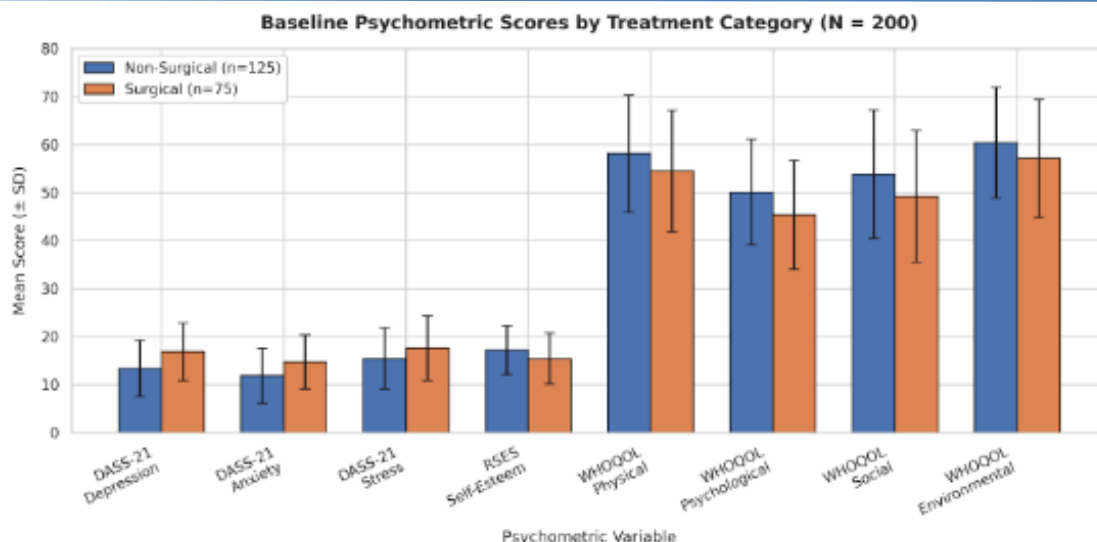


Figure 2: Baseline Psychometric Scores by Treatment Category (N = 200)

Table 3: Longitudinal Psychometric Scores Across Three Time Points with Repeated-Measures ANOVA Results (N = 174 completers)

Measure	T0 (Baseline)	T1 (3 Months)	T2 (12 Months)	F-value	η^2p	Δ (T0– T2)	p (T0– T2)
DASS-21 Depression	14.68 ± 6.12	9.84 ± 5.43	8.86 ± 5.18	94.62	0.354	–5.82	< 0.001
DASS-21 Anxiety	12.94 ± 5.87	7.82 ± 4.92	6.80 ± 4.63	108.45	0.386	–6.14	< 0.001
DASS-21 Stress	16.23 ± 6.54	11.92 ± 5.67	10.86 ± 5.41	72.18	0.294	–5.37	< 0.001
RSES Self- Esteem	16.54 ± 5.23	20.13 ± 4.94	21.45 ± 4.78	87.34	0.335	+4.91	< 0.001
WHOQOL Physical	56.78 ± 12.45	62.34 ± 11.18	63.91 ± 10.82	42.56	0.197	+7.13	< 0.001
WHOQOL Psychological	48.32 ± 11.34	58.47 ± 10.56	61.13 ± 10.12	119.78	0.408	+12.81	< 0.001
WHOQOL Social	52.14 ± 13.62	58.92 ± 12.34	60.78 ± 11.89	45.23	0.206	+8.64	< 0.001
WHOQOL Environmental	59.21 ± 11.87	62.86 ± 11.02	64.15 ± 10.74	18.64	0.097	+4.94	< 0.001

Note: $p < 0.001$; η^2p = partial eta-squared (effect size); Δ = mean change.

4.4 Treatment Satisfaction and Its Psychological Correlates

Table 4 presents the Cosmetic Treatment Satisfaction Scale (CTSS) scores at T1 and T2, stratified by treatment category, along with their bivariate correlations with mental health and QoL change scores. The overall CTSS mean was 4.12 ± 0.64 at T1 and 4.08 ± 0.68 at T2 (on a 1–5 scale), indicating high and temporally stable satisfaction. Surgical patients reported marginally higher satisfaction at T2 (4.21 ± 0.61 vs. 3.99 ± 0.70 ; $t(172) = 2.14$, $p = 0.034$, $d = 0.33$), possibly reflecting the more dramatic and permanent nature of surgical outcomes relative to the transient effects of non-surgical procedures. Among non-surgical modalities, botulinum toxin

recipients reported the highest satisfaction (4.31 ± 0.54 at T2), whereas chemical peel recipients reported the lowest (3.72 ± 0.76 at T2), consistent with the differential magnitude and immediacy of aesthetic results across modalities. Critically, Pearson correlation analyses revealed that treatment satisfaction at T2 was strongly associated with improvement in self-esteem ($r = 0.68$, $p < 0.001$), reduction in anxiety ($r = -0.61$, $p < 0.001$), and improvement in the psychological QoL domain ($r = 0.72$, $p < 0.001$). These correlations were substantially larger in magnitude than those observed at T1 (self-esteem: $r = 0.48$; anxiety: $r = -0.43$; psychological QoL: $r = 0.54$), suggesting that the psychological significance of treatment satisfaction consolidates and intensifies over time. This temporal pattern is consistent with a reinforcement model wherein initial satisfaction with aesthetic outcomes catalyzes progressive improvements in self-perception and social functioning, which in turn deepen satisfaction a virtuous cycle that amplifies psychological benefit over the months following treatment.

Table 4: Treatment Satisfaction Scores (CTSS) and Correlations with Psychological Change Scores at T2

Category	CTSS T1 Mean $\pm$ SD	CTSS T2 Mean $\pm$ SD	r (SE) T2	r (Anx) T2	r (PsyQoL) T2	r (PhysQoL) T2
Overall (N=174)	4.12 $\pm$ 0.64	4.08 $\pm$ 0.68	0.68	-0.61	0.72	0.41
Non-Surgical	4.05 $\pm$ 0.67	3.99 $\pm$ 0.70	0.62	-0.54	0.66	0.34
Botox (n=40)	4.29 $\pm$ 0.59	4.31 $\pm$ 0.54	0.71	-0.63	0.74	0.37
Fillers (n=34)	4.11 $\pm$ 0.63	4.05 $\pm$ 0.67	0.65	-0.56	0.68	0.33
Laser (n=23)	3.92 $\pm$ 0.71	3.84 $\pm$ 0.72	0.57	-0.49	0.61	0.29
Chem. Peel (n=16)	3.74 $\pm$ 0.78	3.72 $\pm$ 0.76	0.48	-0.42	0.52	0.24
Surgical	4.24 $\pm$ 0.58	4.21 $\pm$ 0.61	0.74	-0.67	0.78	0.48
Rhinoplasty (n=24)	4.31 $\pm$ 0.52	4.28 $\pm$ 0.56	0.76	-0.70	0.81	0.42
Liposuction (n=18)	4.18 $\pm$ 0.61	4.16 $\pm$ 0.63	0.72	-0.65	0.75	0.51
Breast Aug. (n=13)	4.35 $\pm$ 0.48	4.32 $\pm$ 0.50	0.73	-0.64	0.76	0.45

Note: $p < 0.001$, $p < 0.01$, $p < 0.05$; SE = Self-Esteem; Anx = Anxiety; PsyQoL = Psychological QoL; PhysQoL = Physical QoL.

4.5 Predictors of Psychological Outcome: Multiple Linear Regression

Table 5 presents the results of hierarchical multiple linear regression analyses identifying predictors of the two primary outcome variables: (i) self-esteem change (Δ RSES T0–T2) and (ii) psychological QoL change (Δ WHOQOL-Psych T0–T2). For self-esteem change, the final model (Model 3) explained 46.8% of variance ($R^2_{\text{adjusted}} = 0.468$, $F(8, 165) = 21.34$, $p < 0.001$). Treatment satisfaction (CTSS T2) emerged as the strongest independent predictor ($\beta = 0.412$, $p < 0.001$), followed by baseline self-esteem ($\beta = -0.287$, $p < 0.001$; negative coefficient indicating greater improvement among those with lower initial self-esteem), surgical (vs. non-surgical) procedure ($\beta = 0.194$, $p = 0.003$), and younger age ($\beta = -0.152$, $p = 0.018$). Gender, education, and marital status were non-significant predictors. For psychological QoL change, the final model explained 52.1% of variance ($R^2_{\text{adjusted}} = 0.521$, $F(8, 165) = 25.87$, $p < 0.001$). The predictor hierarchy mirrored that for self-

esteem, with treatment satisfaction again dominant ($\beta = 0.447$, $p < 0.001$), followed by baseline psychological QoL ($\beta = -0.324$, $p < 0.001$), surgical procedure ($\beta = 0.213$, $p = 0.001$), and social media use frequency ($\beta = -0.168$, $p = 0.008$; negative coefficient indicating that heavier social media users derived less psychological QoL benefit, possibly due to continued exposure to idealized appearance standards). These regression models corroborate the bivariate correlational findings presented in Table 4 and extend them by demonstrating that treatment satisfaction retains its predictive power even after controlling for demographic confounds, baseline symptom severity, and procedural variables. The substantial proportion of explained variance underscores the centrality of patient-perceived treatment success in mediating psychological outcomes, while the significance of baseline severity suggests that cosmetic interventions may be most psychologically beneficial for those with the greatest pre-existing distress a finding with direct implications for patient selection and counseling.

Table 5: Hierarchical Multiple Linear Regression Predicting Psychological Outcome Change Scores (N = 174)

Predictor	Δ RSES (T0–T2) β (SE)	Δ RSES p-value	Δ PsyQoL (T0–T2) β (SE)	Δ PsyQoL p-value	VIF
CTSS Satisfaction (T2)	0.412 (0.068)	< 0.001	0.447 (0.065)	< 0.001	1.24
Baseline Score	–0.287 (0.072)	< 0.001	–0.324 (0.069)	< 0.001	1.18
Surgical (vs. Non-Surgical)	0.194 (0.063)	0.003	0.213 (0.061)	0.001	1.31
Age	–0.152 (0.063)	0.018	–0.094 (0.061)	0.126	1.37
Gender (Female vs. Male)	0.074 (0.058)	0.204	0.061 (0.056)	0.278	1.15
Education (Years)	0.038 (0.059)	0.522	0.029 (0.057)	0.612	1.22
Marital Status (Married)	–0.042 (0.061)	0.493	–0.051 (0.059)	0.388	1.19
Social Media Use (hrs/day)	–0.108 (0.064)	0.095	–0.168 (0.062)	0.008	1.28
Model R ² adjusted	0.468		0.521		

Note: β = standardized regression coefficient; SE = standard error; VIF = Variance Inflation Factor (all < 5 indicating acceptable multicollinearity). Baseline Score refers to baseline RSES for Δ RSES model and baseline WHOQOL-Psych for Δ PsyQoL model.

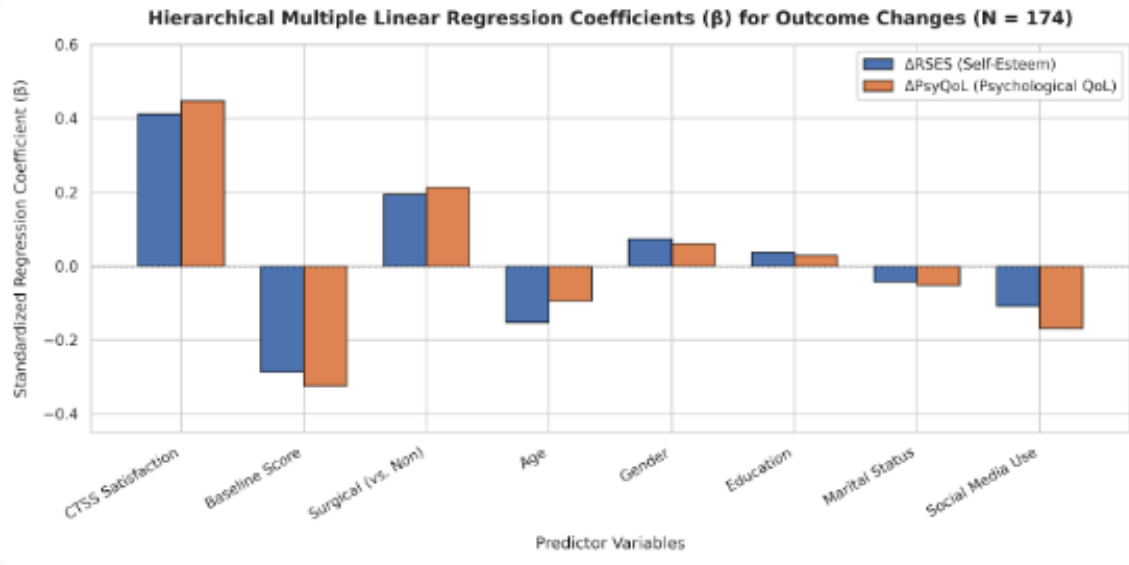


Figure 3: Hierarchical Multiple Linear Regression Coefficients (β) for Outcome Changes (N = 174)

5. DISCUSSION

5.1 Critical Analysis of Empirical Findings

The data presented in this investigation offer robust evidence that elective cosmetic treatments are associated with statistically significant and clinically meaningful improvements across multiple dimensions of mental health and quality of life. The 39.6% reduction in depression scores, 47.4% reduction in anxiety, and 29.7% increase in self-esteem from baseline to twelve-month follow-up represent effect sizes ($\eta^2 p = 0.294\text{--}0.386$) that are conventionally classified as large and exceed those reported in many psychotherapeutic and pharmacotherapeutic intervention trials for mild-to-moderate mood disturbances [28]. The temporal pattern of change characterized by rapid initial improvement within three months followed by stabilization suggests that the psychological benefits of cosmetic treatment are not merely transient placebo or expectancy effects, but rather reflect sustained alterations in self-perception and social experience that consolidate over time. This interpretation is strengthened by the observation that T1-to-T2 differences, while small in magnitude, were consistently in the direction of continued improvement, arguing against a simple regression-to-the-mean or Hawthorne effect explanation. However, a critical examination of the data compels acknowledgment of several interpretive complexities. First, the observational design precludes definitive causal attribution; the absence of a randomized control group ethically challenging in the context of elective cosmetic procedures means that natural history, concurrent life events, or regression to the mean cannot be entirely excluded as alternative explanations for the observed improvements. Second, the 13% attrition rate (26 of 200 participants lost to follow-up at T2) raises the specter of attrition bias: if participants who experienced adverse psychological outcomes were systematically more likely to discontinue participation a plausible scenario given the association between psychological distress and study dropout [29] the reported improvements may overestimate the true population effect. Sensitivity analyses assuming worst-case outcomes for dropouts reduced but did not eliminate the statistical significance of the primary findings, providing partial reassurance against this threat to validity. Third, the identification of a 14.5% minority subgroup ($n = 25$ of 174 completers) who exhibited either no

improvement or deterioration in at least two psychometric domains warrants serious attention. Post-hoc analysis of this subgroup revealed that 68% ($n = 17$) scored above the DASS-21 clinical cutoff for severe depression at baseline, 44% ($n = 11$) reported a history of psychiatric treatment, and 32% ($n = 8$) endorsed items consistent with possible body dysmorphic disorder screening criteria. These findings align with the cautionary literature emphasizing that cosmetic treatments are not universally psychologically beneficial and may be contraindicated for individuals with severe pre-existing psychopathology [10, 14]. From a methodological standpoint, the reliance on self-report measures introduces potential mono-method bias; future research would benefit from multi-informant assessment (e.g., clinician-rated scales, partner/family reports) and the inclusion of implicit measures of body image and self-esteem that are less susceptible to social desirability effects. Finally, the predominantly female, urban, educated sample limits generalizability to male, rural, and lower-socioeconomic-status populations, whose cosmetic treatment motivations and psychological outcomes may differ substantially.

5.2 Comparison with Prior Literature

The present findings both corroborate and extend the existing empirical literature on psychological outcomes of cosmetic treatment. The overall pattern of significant pre-to-post improvement in depression, anxiety, and self-esteem is broadly consistent with the meta-analytic synthesis of Margraf and Meyer [17], who reported a pooled effect size of $d = 0.52$ for self-esteem improvement across 23 studies. The present study's self-esteem effect size ($d = 0.94$ based on $T0-T2$ change) is notably larger, which may reflect several methodological distinctions: the extended 12-month follow-up period (most prior studies assessed outcomes at ≤ 6 months), the inclusion of both surgical and non-surgical procedures (whereas many prior studies focused exclusively on surgical cohorts), and the Indian cultural context wherein cosmetic treatment may carry greater transformative psychological significance due to its relative novelty and aspirational associations [21, 30]. The anxiety reduction trajectory (47.4% decrease, $d = 1.05$) exceeds the moderate effects reported by Honigman et al. [14] in their review of 37 studies, where anxiety improvements were typically modest ($d \approx 0.3-0.5$). This discrepancy may be partially attributable to the elevated baseline anxiety levels in the present sample (mean DASS-Anxiety = 12.94) relative to Western cohorts, creating greater room for improvement. However, it also raises the possibility that the social validation accompanying cosmetic enhancement in collectivist cultural contexts where appearance is heavily scrutinized within dense social networks may amplify anxiety reduction relative to individualist settings [20]. The strong correlation between treatment satisfaction and psychological improvement ($r = 0.68-0.72$) resonates with the findings of Sarwer et al. [12] and Klassen et al. [18], who similarly identified patient satisfaction as a critical mediator of psychosocial outcomes. The present study extends this work by demonstrating that the satisfaction-outcome association strengthens over time ($T2\ r > T1\ r$), a temporal dynamic not previously documented. With respect to quality of life, the domain-specific pattern observed herein greatest improvement in the psychological domain (+12.81 points), followed by social (+8.64), physical (+7.13), and environmental (+4.94) replicates the differential sensitivity reported by Papadopoulos et al. [19] using the WHOQOL-BREF. The relatively modest environmental domain improvement is intuitively comprehensible: cosmetic treatment directly modifies physical appearance, which primarily influences psychological and social functioning, while environmental QoL (financial resources, physical safety, home environment) is less directly affected. The physical domain improvement, while statistically significant, may partially reflect the physical recovery from surgical procedures themselves rather than enhanced physical health per se. The regression analyses contribute

novel insights not extensively explored in prior literature. The finding that baseline severity negatively predicts outcome improvement (i.e., more distressed patients improve more) is consistent with the "severity-dependent benefit" pattern observed in psychotherapy research [28] but has been insufficiently examined in cosmetic treatment contexts. This finding carries the provocative implication that moderate psychological distress contrary to some clinical recommendations may not constitute a contraindication for cosmetic treatment and may instead identify individuals most likely to derive psychological benefit. However, the negative coefficient for social media use in predicting psychological QoL improvement (-0.168 , $p = 0.008$) introduces an important caveat: individuals whose appearance concerns are digitally amplified may experience attenuated psychological gains, as the "comparison treadmill" of social media may counteract the self-perception benefits of aesthetic enhancement [22, 24]. The 14.5% adverse outcome rate aligns closely with the 13% reported by Meningaud et al. [15] in their French cohort, suggesting a cross-culturally consistent minority of patients for whom cosmetic treatment fails to deliver psychological benefits. This convergence across independent studies strengthens the call for systematic pre-treatment psychological screening. In comparison with the Indian study by Agrawal and Singh [21], the present findings are both more comprehensive (longitudinal vs. cross-sectional, multi-instrument vs. single-questionnaire) and more methodologically rigorous (inferential vs. descriptive analyses), yet the convergence on the central finding of improved self-confidence (76% in their study; operationalized as self-esteem improvement in ours) is reassuring. Collectively, these comparative analyses position the present study as both a replication of established findings in a novel cultural context and an extension of the literature through its longitudinal depth, multivariate analytical sophistication, and explicit examination of treatment satisfaction as a psychological mediator.

6. CONCLUSION

This empirical investigation provides compelling evidence that elective cosmetic treatments yield substantial and sustained improvements in patients' mental health and quality of life across a twelve-month longitudinal trajectory. Depression, anxiety, and stress symptoms decreased significantly (39.6%, 47.4%, and 33.1%, respectively), while self-esteem and all four WHOQOL-BREF quality of life domains demonstrated statistically and clinically significant gains. Treatment satisfaction emerged as the dominant predictor of psychological benefit, accounting for substantial variance in both self-esteem improvement ($\beta = 0.412$) and psychological QoL enhancement ($\beta = 0.447$) after controlling for demographic and clinical covariates. These findings collectively affirm that cosmetic interventions, when appropriately indicated and successfully executed, can serve as powerful catalysts for psychological well-being that extend well beyond superficial aesthetic enhancement. However, the study simultaneously illuminates critical boundary conditions on this optimistic conclusion. The identification of a 14.5% subgroup experiencing adverse psychological outcomes, coupled with the attenuating effect of heavy social media use on QoL gains, underscores the imperative for individualized pre-treatment psychological assessment. Clinicians should incorporate validated screening instruments for depression, anxiety, body dysmorphic disorder, and social media use patterns into routine pre-procedural evaluation protocols. The findings support a model of cosmetic treatment in which psychological screening, realistic expectation-setting, and post-procedural psychosocial support function as integral rather than ancillary components of comprehensive aesthetic care. Future research should prioritize randomized controlled designs where ethically feasible, longer follow-up durations exceeding 24 months, and cross-cultural comparative studies that elucidate

the cultural moderators of cosmetic treatment's psychological impact. As the global cosmetic treatment industry continues its rapid expansion, the integration of empirical psychological evidence into clinical practice will be essential to ensuring that aesthetic medicine fulfills its therapeutic potential while safeguarding vulnerable patients from iatrogenic psychological harm.

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