

## Quality of life before and after cosmetic surgery

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This article reviews the literature regarding the impact of cosmetic surgery on health-related quality of life (QOL). Studies were identified through PubMed/Medline and PsycINFO searches from January 1960 to December 2011. Twenty-eight studies were included in this review, according to specific selection criteria.

The procedures and tools employed in cosmetic surgery research studies were remarkably diverse, thus yielding difficulties with data analysis. However, data indicate that individuals undergoing cosmetic surgery began with lower values on aspects of QOL than control subjects, and experienced significant QOL improvement post-procedurally, an effect that appeared to plateau with time.

Despite the complexity of measuring QOL in cosmetic surgery patients, most studies showed an improvement in QOL after cosmetic surgery procedures. However, this finding was clouded by measurement precision as well as heterogeneity of procedures and study populations. Future research needs to focus on refining measurement techniques, including developing cosmetic surgery-specific QOL measures.

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### Introduction

Cosmetic surgery is becoming more increasingly utilized worldwide. In the United States, more than 1.5 million cosmetic procedures are performed yearly, the top 5 of which are breast augmentation, rhinoplasty, blepharoplasty, liposuction, and rhytidectomy.<sup>1</sup> Cosmetic surgery is defined according to the American Board of Cosmetic Surgery (ABCS)<sup>2</sup> as “a unique discipline of medicine focused on enhancing appearance through surgical and medical techniques. Cosmetic surgery can be performed on all areas of the head, neck and body. Because treated areas function properly but lack aesthetic appeal, cosmetic surgery is elective.” Although the motivations for undergoing cosmetic surgery are likely diverse, it is reasonable to think that one of the

major aims in undergoing such procedures is to ultimately improve one’s subjective well-being and health-related quality of life (QOL). Post-surgery interviews have revealed that patients often believe that cosmetic surgery achieves not only a physical change, but also a transformation in QOL.<sup>3</sup>

We use the term “cosmetic” in this article consistently to minimize term confusion, although it is significant to note that “cosmetic” is synonymous with “aesthetic,” a term often used to describe cosmetic surgical procedures. The ABCS distinguishes between cosmetic surgery from plastic surgery by stating that: “Cosmetic surgery procedures enhance a person’s appearance toward some aesthetic ideal,” whereas “plastic surgery focuses on repairing and reconstructing abnormal structures of the body caused by birth defects, developmental abnormalities, trauma, infection, tumors or disease.” Our usage of “quality of life” is guided by the World Health Organization (WHO), which has provided a conceptual definition of QOL as people’s perceptions of their positions in life, in the context of the culture and

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value systems in which they live, and in relation to their goals, expectations, standards, and concerns.<sup>4</sup> According to the WHO, the operational definition of QOL lends itself to measuring specific domains, such as subjective rating of physical health (eg, mobility), psychological health (eg, self-esteem), social relationships (eg, social support), and environment (eg, financial resources).<sup>5</sup> Thus, factors such as physical appearance and body image are also related to QOL, for body image consists of “perceptions, thoughts, feelings, and behaviors not only about physical appearance but also one’s body’s competence, or fitness, and its biological integrity, or health/illness.”<sup>6</sup> QOL encompasses the issues surrounding how one feels about one’s own self/appearance and one’s engagement and satisfaction with life activities, such as work, relationships, and leisure.<sup>4,5</sup>

This article attempts a comprehensive review of the effects of cosmetic procedures on patients’ QOL. At the outset, it is important to note that while a large number of studies examined the relationship between cosmetic surgery and QOL, measuring QOL in this patient population remains to be remarkably challenging. QOL, as defined earlier,<sup>5</sup> not only encompasses issues of appearance, but also of physical health, relationships, and social activities. However, the existing QOL literature on cosmetic surgery is quite fragmented and heterogeneous in that many studies we analyzed used a variety of general and procedure- or organ-specific QOL measurement tools.<sup>7,8</sup> Moreover, there is a lack of consensus on how constructs are defined, measured, and differentiated. For instance, some articles (that we ended up excluding) used the terms “QOL” and “body image” interchangeably. Consequently, future work on this important subject should attempt to employ specific scales to measure QOL in cosmetic surgery across procedures.

Furthermore, previous reviews have focused either on a particular body part, procedure, or set of measures. In addition, some studies, including one by Honigman *et al*,<sup>9</sup> concentrated on other valuable information, such as predictors of poor psychological or psychosocial outcome, rather than solely on pre- and post-QOL of different cosmetic surgeries. As a result, information regarding QOL at baseline and changes over time still needs to be explored. An assessment of the impact of cosmetic surgery on QOL would be of substantial value to patients who are thinking of undergoing cosmetic procedures, as well as to physicians who may be managing their physical and psychological health issues. Therefore, this review examines QOL across different body parts and procedures, especially before and after cosmetic surgery, in order to answer the following questions: What is the status of QOL before cosmetic surgery? Are there QOL improvements post-procedurally? And in patients experiencing QOL improvements, are these improvements sustained over time?

## Review of Studies

The search strategy and yield are detailed in Figure 1.

### Search strategy

A systematic literature search of articles published from January 1960 to December 2011 was conducted on PubMed/Medline and PsycINFO using the keywords “quality of life” OR “well-being” OR “self-esteem” AND “cosmetic” OR “aesthetic” OR “plastic” (in order to widen the scope of the search) AND “surgery.” We also reviewed the reference list of review articles for additional studies. This strategy identified 721 articles.

### Study selection criteria and methodology

Two authors reviewed the 721 studies independently using the following inclusion criteria: (1) Articles in English or with an available published English translation, (2) publication in a peer-reviewed journal, (3) studies performed on adults, (4) Studies (of any design) that focused on cosmetic surgery, and (5) studies that used at least 1 self-reported outcome measure. Fifty-one articles met the above criteria, and 2 reviewers conducted a focused review using the full-text articles of studies that met the above criteria by assessing the studies for sample size, patient selection, interventions, group comparison, outcome measures, and statistical analysis, using study quality criteria adapted from Lohr and Carey<sup>10</sup> by the Agency for Healthcare Research and Quality.<sup>11</sup> This process led to the exclusion of 21 studies with serious limitations, such as studies with very small effective sample size and studies that used vague or insufficient data about outcome measurement. Two additional studies were excluded because they included procedures performed primarily for a medical indication (eg, bariatric surgery for morbid obesity) or office-based nonsurgical cosmetic procedures (eg, injectables). QOL studies in post-bariatric surgery procedures dealing with the cosmetic consequences of this type surgery were included in this review. The reviewers reached a consensus to include in this review 28 studies.

### Data extraction

Research methodology and key findings were derived from the full text and tables of the selected 28 studies. Study design and findings are detailed in Table 1.

### Types of cosmetic surgery procedures

The identified studies reported on outcomes of the following procedures: rhytidectomy, rhinoplasty, breast reduction or augmentation, abdominoplasty/liposuction, and blepharoplasty/orthognathic surgery. Additionally, several studies described outcomes in patients who were pooled from a variety of the above cosmetic surgery interventions.

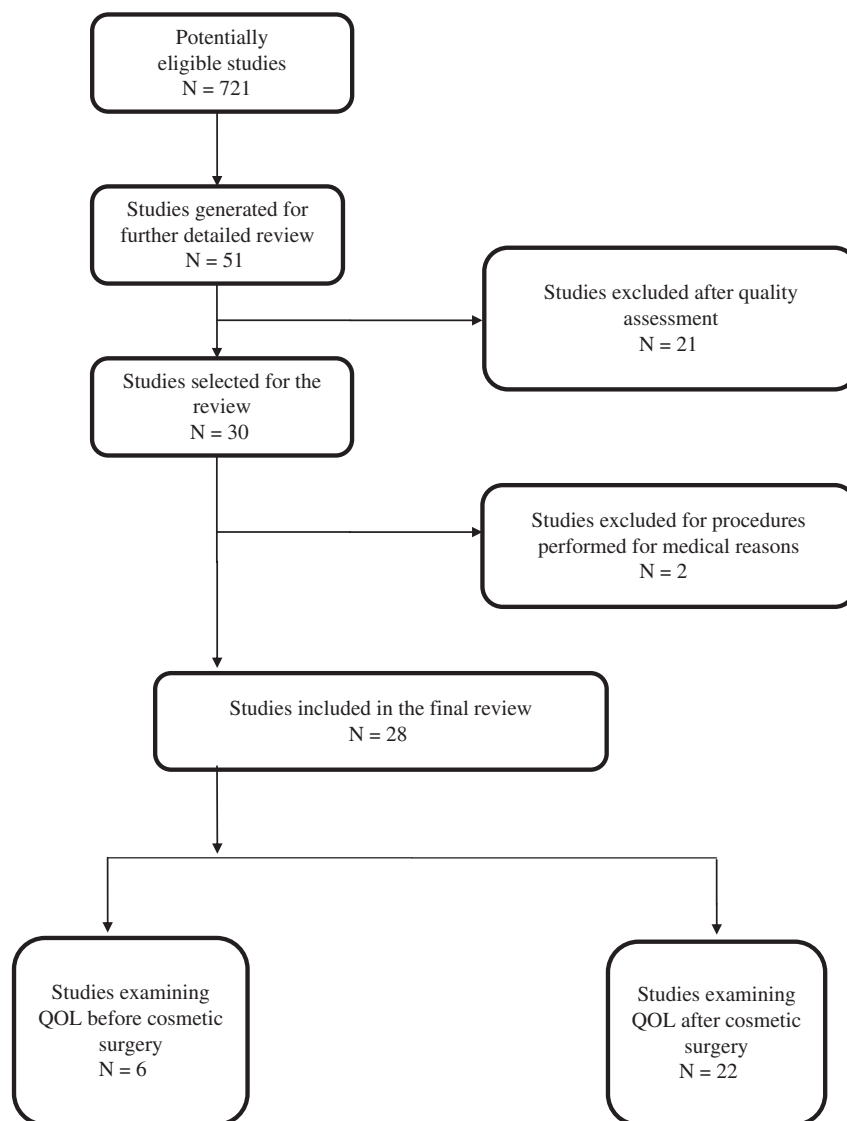


FIGURE 1. Search strategy for studies examining QOL before and after cosmetic surgery.

### Reviewed studies

The studies addressing QOL in cosmetic surgery including QOL before and after intervention, type of intervention, and outcome measurement issues, are highlighted in the next sections.<sup>8,12–38</sup> Characteristics of all reviewed studies including methodology, outcome measures, number of subjects, demographics, and summary of the findings are presented in Table 1.

### Pre- and post-operative QOL

#### QOL before cosmetic surgery

Six studies included assessment of QOL before cosmetic surgery interventions. Overall, the reviewed studies showed that cosmetic surgery candidates suffered from

low QOL pre-operatively.<sup>13,15,21,34</sup> Of note, 2 studies utilized general QOL measures that are widely used across illness and health states. Using the Medical Outcomes Study (SF-36), Blomqvist *et al*<sup>8</sup> showed that breast reduction candidates had significantly lower QOL baseline ratings compared to age-matched controls. Meningaud *et al*<sup>29</sup> used the European Quality of Life-5 Dimensions (EQ-5D) to measure QOL at baseline in facial cosmetic surgery candidates. Although the anxiety/depression dimension of the EQ-5D indicated worse QOL at baseline, the mean EQ-5D VAS (overall QOL) scores did not significantly differ from community norm values.<sup>29</sup> This illustrates the challenge in the assessment of QOL due to difference between study groups and the different measurement techniques used for assessing patient QOL.<sup>13</sup>

TABLE 1. Quality of life in cosmetic surgery

References	Methodology	Measure	N	Demographics	Summary of findings
Bolton <i>et al</i> <sup>35</sup>	Prospective	Appearance Evaluation subscale of the MBSRQ	30	Female	<b>Liposuction and abdominoplasty</b> were followed by significant improvement in body image outcome but no change in general psychosocial well-being after 2 months.
Hueston <i>et al</i> <sup>20</sup>	Prospective	MHQ, LEQ, SAS, LCS, and RSE	169	Male and female. 35 years. Female = 100% of breast surgery and face-lifts, and 83% of abdominoplasty, 81% of rhinoplasty, and 79% of blepharoplasty.	Evaluated the psychological functioning of a large group of patients who underwent plastic surgery: <b>Augmentation and reduction mammoplasty, rhytidectomy, blepharoplasty, and abdominoplasty</b> . A control group was established among patients who underwent wrist surgery. Result: Improvement of psychological functioning after the surgical procedure at a 3-month follow-up evaluation.
Litner <i>et al</i> <sup>33</sup>	Prospective	DAS 59	93	82 females (88%) and 11 males (12%). 16+ years.	<b>Facial cosmetic surgery: rhinoplasty and correction of aging face.</b> Facial cosmetic surgery enhanced QOL as measured after 3 months. Males were more improved in General Self-Consciousness of Facial Appearance.
Alves <i>et al</i> <sup>32</sup>	Prospective	SF-36 and RSE	32	Female, Caucasian. Range: 46–68 years old. M = 55.1.	<b>Rhytidoplasty</b> applied to these patients had a very good impact on their self-esteem and QOL. The results were assessed pre-operatively and at 2 and 6 months after surgery. A progressive improvement in all the areas assessed in this study was shown by data collected after surgery.
Blomqvist <i>et al</i> <sup>8</sup>	Prospective	SF-36	49	Female. 20+ years.	<b>Reduction mammoplasty.</b> Before the procedure, the treatment group stated a much lower QOL than the control group, especially in the areas of vitality, social functioning, and emotional role. Improvement increased up to 12 months and the expectations were met to a large extent. After 1 year, the patients' scores were at the same level as the ones from the control group in terms of QOL, by the SF-36 standards.
Eggert <i>et al</i> <sup>27</sup>	Prospective	SF-36	57	Female. Range: 17–74 years. Median age = 43 years.	<b>Reduction mammoplasty:</b> 65 consecutive women underwent a medial flap mammoplasty performed by the same surgeon in a unique center. An objective aesthetic evaluation and a subjective assessment were done at 6 months: 89% had satisfactory results and increased quality of life, especially in comparison with the pre-operative self-assessment of quality of life. NB: The aesthetic result was ranked more favorably by the patients than by the panel of surgeons.
Klassen <i>et al</i> <sup>12</sup>	Prospective	SF-36, GHQ-28, and RSE	198	Male: 19.2% = 38, Female = 160. Range: 16–74 years. M = 32.6 years, SD = 12.3	Comparative study of QOL before and after <b>reduction mammoplasty, nose and ear surgery, and abdominoplasty</b> . Data were collected from 9 plastic surgeons in the Oxford area up to 6 months after the surgery. Surgery was effective in improving self-esteem and other psychological or social problems. The 3 tools used to measure this impact were judged as efficient and reliable.
Murphy <i>et al</i> <sup>30</sup>	Prospective	OQLQ, VAS, GTS	62	27 males, 35 females. Range: 18–38 years.	<b>Orthognathic surgery.</b> OQLQ, VAS, and GTS completed 6 months following treatment. Results showed a significant improvement in OQLQ in all 4 domains: facial aesthetics, awareness, social aspects of deformity, and oral function. Patients described an improvement, ranging from minor to large, in all 4 domains of GTS: facial appearance (93%), chewing function (64%), comfort (60%), and speech (32%).

TABLE 1. Continued

References	Methodology	Measure	N	Demographics	Summary of findings
Papadopoulos <i>et al</i> <sup>36</sup>	Prospective	Questions on Life Satisfaction Modules, for assessing general and health-related quality of life.	132 after 3 months; 82 after 6 months responded	9% male, 91% female.	<b>An unspecified type of aesthetic surgery</b> with a 3-month and 6-month follow-up showed a satisfaction index of 84%, with 85% ready for undergoing the same procedure if needed compared to the control group.
Rankin <i>et al</i> <sup>22</sup>	Prospective	4 instruments were used for this study: PRQ-85, CES-D, and WCS. Depression was assessed with the CES-D scale.	105	10% male, 90% female	Elective <b>cosmetic surgery (liposuction, rhinoplasty, rhytidectomy, breast augmentation, abdominoplasty, laser resurfacing)</b> had positive effects on the patients, and the QOL improved significantly from the baseline measurement, progressively from the immediate post-operative period to the next 1-month and 6-month assessments. The mean score for depression on the CES-D scale went from 11.2 to 6.5 at 1 month and to 6.3 at 6 months. The positive outcomes brought by cosmetic surgery were long lasting and markedly improved the QOL of the patients.
Sabino Neto <i>et al</i> <sup>15</sup>	Prospective	SF-36 and RSE	35	Female	Women who underwent reduction mammoplasty had lower self-esteem pre-operatively than the control group. Surgical <b>correction of breast asymmetry</b> had a significant impact on patients' self-esteem and QOL, both of which improved markedly at 3 months and even more so at 6 months after the surgery.
Sabino Neto <i>et al</i> <sup>14</sup>	Prospective	RSE and Rolland-Morris scale + VAS for pain intensity	46/50 completed the study	Female. Range: 18–55 years. M = 31.6, SD = 11. Control: 32.3 years (SD = 10)	<b>Reduction mammoplasty</b> significantly improved quality of life measured by functional capacity, self-esteem, and pain intensity, compared to the control group at 6 months.
Von Soest <i>et al</i> <sup>19</sup>	Prospective	MBSRQ, AES, and RSE	155	Female. Range: 22–55 years.	<b>Breast reduction, breast augmentation, and abdominoplasty</b> were evaluated in women who had never received any plastic surgery previously. Comparisons of pre-surgery to 6 months revealed improvement of satisfaction with appearance and body image.
Meningaud <i>et al</i> <sup>29</sup>	Prospective	4 tests were used: EQ-5D, MADRS, SISST, and a customized questionnaire	103 after 9 months; 24 were lost for f/u	92 female, 11 male	<b>Facial cosmetic surgery</b> was analyzed in this study at baseline and after 9 months. EQ-5D VAS (visual analog scale) did not reveal any modification after surgery. On the other hand, descriptive EQ-5D showed over-representation of anxiety or depression before surgery, which improved after surgery. Satisfaction was estimated with patient's self-assessment and the mean value was 8.1 on a scale of 1 to 10. The best indication for facial aesthetic surgery seems to be poor self-confidence with desire for seduction in social relationships. Control group was present.
Meyer and Ringberg <sup>17</sup>	Prospective	CMPS and MNT	38	Female. 38.4 years. SD = 5.9 years.	One-year follow-up after <b>augmentation mammoplasty</b> . A control group was chosen among patients undergoing skin surgery for benign tumors in the same department. 86% of patients were satisfied with the outcome of the surgery. The authors pointed out the need of a better assessment tool to predict a poor outcome for this procedure.
Ozgür <i>et al</i> <sup>13</sup>	Prospective	SEI, LSI, and BII	100	Female = 73, male = 27	<b>Rhinoplasty, mammoplasty, abdominoplasty, liposuction, dermabrasion other than for acne</b> , within a 12-month period, showed similar results for the LSI and BII for the treatment and control group prior surgery. For the SEI index, better scores were shown for the aesthetic surgery group compared to the control group.

TABLE 1. Continued

References	Methodology	Measure	N	Demographics	Summary of findings
Sarwer <i>et al</i> <sup>16</sup>	Prospective	MBSRQ-AS, BDDE-SR, SIBID-S, BIQLI, BDI-II, and RSE	72	98% female, 2% male. Range: 21–65 years.	The surgeries included <b>breast augmentation, blepharoplasty, lipoplasty, and rhinoplasty</b> . 87% reported positive outcomes from surgery at 3, 6, or 12 months. 93% would undergo this kind of surgery again. No improvement in self-esteem according to the RSE scale.
Smeets <i>et al</i> <sup>38</sup>	Prospective	FACIT-SP	98	87 females and 11 males	<b>Liposuction and abdominoplasty</b> had similar improvements in QOL over one year after surgery: 9.67 for liposuction and 8.66 for abdominoplasty. This result is independent of age and gender.
Spector <i>et al</i> <sup>26</sup>	Prospective	Unspecified questionnaire targeting QOL	188	Female	<b>Reduction mammoplasty</b> resulted in dramatic improvement of symptoms related to macromastia and in QOL when outcome was assessed 3 months to 1 year post-operatively. The results were very similar in 4 different groups of patients separated according to the weight of breast removed.
Thoma <i>et al</i> <sup>25</sup>	Prospective	SF-36, MBSRQ, and BRSQ	52	Female	Patients completed questionnaires at 1 week and 1 day before <b>breast reduction surgery</b> as well as 1, 6, and 12 months after surgery. Mean values in all measures improved following surgery. The greatest mean increase in these measures was noted between 1 day before surgery and 1 month after surgery. Increased measures were maintained for up to 1 year after surgery.
Flanary <i>et al</i> <sup>31</sup>	Prospective	EPI, 16PF, FES, TSCS, and MBHI	61	23 males and 38 females (17+ years). M = 28.1, SD = 8.2. No control group.	Follow-up from 1 month before to 24 months after <b>orthognatic surgery</b> . Patients' personality was assessed pre- and post-operatively by an independent researcher. Before the operation, candidates scored within 64% of the 'normal' range (TSCS). At one and two years from the operation, their self-confidence was improved by 72.1% and 77.0%, and even among the ones with personality disorders, a significant improvement was observed.
Sarwer <i>et al</i> <sup>21</sup>	Prospective	MBSRQ-AS, BDDE-SR, SIBID-S, BIQLI, BDI-II, and RSE	65 out of the 72 initially studied	98% female, 2% male. Range: 21–65 years. Same sample as the one used in the 2005 study. <sup>16</sup>	Preoperatively, the results of the BIQLI, SIBID-S, and BDDE-SR were comparable to that of the RSE. The BDDE-SR index was not used for assessment of body dysmorphic disorder, but to identify specific body features most responsible for the negative feelings, which motivated the decision for cosmetic surgery. High rate of satisfaction in the first 3 months, maintained throughout 24 months after plastic surgery. <b>Breast augmentation, blepharoplasty, lipoplasty, and rhinoplasty</b> were undergone by the patients from the previous study.
Shakespeare and Postle <sup>18</sup>	Prospective	Open-format survey, semistructured telephone interview and RSE.	60	Female. Range: 18–63 years. M = 33, SD = 13.	Follow-up after 2 years postoperatively of the same population of patients who were studied at 3 and 6 months after <b>reduction mammoplasty</b> . Improvement in self-esteem remained in 55 of the patients who replied. Long-term benefit was maintained with this kind of surgery.
Rohrich <i>et al</i> <sup>24</sup>	Retrospective	IRB-approved assessment sheet	50	Female	Analysis of quality of life after <b>explantation surgery</b> done (after 3 years on average) on patients who previously had breast augmentation surgery using silicone gel implants technique. Out of the 180 patients in the database, 50 responded. 50% reported QOL improvement, whereas 36% reported a decrease in QOL.

TABLE 1. Continued

References	Methodology	Measure	N	Demographics	Summary of findings
Van der Beek <i>et al</i> <sup>28</sup>	Prospective	OPSQ	43	2 males, 41 females. Range: 23–60 years. 41.5 years	<b>Abdominoplasty and mammoplasty</b> were performed after bariatric surgery (mean interval: 42 months). Even with a high rate of complications (27.9%), 67% were satisfied with the outcome of the surgery, which provided them with a noticeable improvement of QOL.
Cintra <i>et al</i> <sup>37</sup>	Prospective	AODS	16	Female	<b>Abdominoplasty</b> after bariatric surgery 24–48 months previously and a stable weight for 12 months. Overall quality of life was improved, with 81.3% of the patients having social and cultural domains ameliorated and 62.5% having amelioration in personal relations/ affectivity.
Glatt <i>et al</i> <sup>23</sup>	Prospective	BDDE-SR and BCRS	61	Female	Between 1982 and 1996, the patients from 1 center, who were operated on by the same surgeon for <b>reduction mammoplasty</b> , were followed-up for this study. Analysis of data showed a difference between pre- and post-operative results (on average 5 years after the surgery). The results showed more than 70% improvement in painful symptoms and a marked diminution in patients' negative appreciation of their body image due to their macromastia. However, it is surprising to notice that these patients would prefer an even smaller breast size. Non-obese women more frequently reported embarrassment from their macromastia than obese women.
Lazar <i>et al</i> <sup>34</sup>	Retrospective	2 customized questionnaires and double blind surgical and psychological examinations	41	32 female and 9 male. Range: 21–58 years. Median age = 38.	<b>Abdominoplasty</b> applied to patients after bariatric surgery that led to an average 42.2 kg weight loss. Prior to surgery, patients reported dissatisfaction in five areas of QOL: current life, dressing, aesthetics, psychological status, and sexual life. A senior surgeon operated on patients, and the outcome data were collected after 57.7 months on average (nearly 5 years). 96.1% would undergo this type of procedure again. 84.6% displayed improved QOL, 86.5% displayed improved psychological status, 74% displayed better sexual lives, and 53.9% displayed enhanced enjoyment of their bodies. 56% of the patients regained weight after the intervention.

Abbreviations: 16PF, Sixteen Personality Factor Questionnaire; AES, Appearance Evaluation Subscale of the Multidimensional Body Self-Relations Questionnaire; AODS, Adaptive Operationalized Diagnostic Scale; BCRS, Brief Cognitive Rating Scale; BDDE-SR, Body Dysmorphic Disorder Examination Self Report; BIA, Bioelectric Impedance Analysis; BMI, Body Mass Index; BII, Body Image Inventory; BIQLI, Body Image Quality of Life Inventory; BDI-II, Beck Depression Inventory II; CES-D, Center for Epidemiologic Studies Depression Scale; CMPS, Cesarc-Marke Personality Scheme; DAS 59, Derriford Appearance Scale; EQ-5D, European Quality of Life-5 Descriptive Self-Report Index; EPI, Eysenck Personality Inventory; FACIT-SP, Functional Assessment of Chronic Illness Therapy-Spiritual; FES, Family Environment Scale; GHQ-28, Scaled General Health Questionnaire-28; HRQOL, Health-Related Quality of Life; LCS, Locus of Control Scale; LEQ, Life Events Questionnaire; LSI, Life Satisfaction Index; MADRS, Montgomery-Asberg Depression Rating Scale; MBHI, The Millon Behavioral Health Inventory; MBSRQ, Multidimensional Body Self-Relations Questionnaire; MBSRQ-AS, Multidimensional Body Self Relations Questionnaire Appearance Assessment; MHQ, Middlesex Hospital Questionnaire; MNT, Marke-Nyman Test; MOS-HIV, Medical Outcomes Study HIV Health Survey; OPSQ, Obesity Psycho-social State Questionnaire; OQLQ, Orthognathic Quality of Life Questionnaire; GTS, Global Transition Scale; PRQ-85, Personal Resource Questionnaire; QOL, quality of life; QOLOD, Quality of Life, Obesity and Dietetics RSE, Rosenberg Self Esteem Scale; SAS, Social Adjustment Scale; SEI, Self-Esteem Inventory; SF-36, Short Form-36; SIBID-S, Situational Inventory of Body Image Dysphoria—Short Form; SISST, Social Interaction Self-Statement Test; TSCS, Tennessee Self-Concept Scale; VAS, Visual Analog Scale; WCS, Ways of Coping Scale.

*Short-term outcome: QOL within 6 months of cosmetic surgery*

Sixteen studies included assessment of QOL within 6 months post-surgery.<sup>8,12,14–16,18,20–22,25,27,30,32,33,35,36</sup> Except for 1 study, patients undergoing cosmetic surgery showed improvement in QOL mean scores within the first 6 months. In the single study that did not show QOL improvement, by Bolton *et al*,<sup>35</sup> the authors cited 2 potential reasons for the findings: (1) collection of outcome data after the relatively short period of time of 2 months and (2) the need to use more QOL specific instruments. In contrast, facial cosmetic surgery candidates showed progressive QOL improvement as early as 2 months in a study using the SF-36,<sup>32</sup> as well as 3 months<sup>33</sup> and 6 months.<sup>30,32</sup> Moreover, Sarwer *et al*<sup>16</sup> studied 100 prospective cosmetic surgery candidates for 1 of 5 cosmetic surgeries: breast augmentation/breast lift, lipoplasty, rhinoplasty, rhytidectomy, and blepharoplasty. A multivariate analysis of variance (MANOVA) showed a significant improvement in QOL ( $p < 0.0001$ ) and depression (using the Center for Epidemiologic Studies Depression Scale; CES-D) from baseline levels at 1 and 6 months post-operatively.<sup>16</sup> Reduction mammoplasty was also noted to have a significant positive impact on QOL following the procedure in all studies.

*Intermediate-term outcome: QOL 1 year after cosmetic surgery*

Seven studies included assessment of QOL 1 year after cosmetic surgery, and 1 included assessment of QOL after 9 months. The findings indicate that 1-year postoperative QOL improved significantly compared to baseline across a variety of cosmetic procedures. Patients who underwent blepharoplasty, lipoplasty and rhinoplasty,<sup>16</sup> augmentation<sup>16,17</sup> and reduction<sup>25,26</sup> mammoplasty, liposuction and abdominoplasty,<sup>13,38</sup> and facial cosmetic procedures<sup>29</sup> have been shown to experience significant QOL improvements compared to baseline after nearly 1 year. Notably, in one age-matched controlled study of reduction mammoplasty, the 12-month scores for the mammoplasty patients were close to the age-matched SF-36 scores, indicating normalization.<sup>3</sup> Additionally, sexual life also has a prominent role in QOL assessment after cosmetic surgery. One year after augmentation mammoplasty, 86% of patients not only reported both a satisfaction with the results of the surgery, but also an enhanced QOL in the area of sexual life with a 46% improvement.<sup>17</sup>

*Long-term outcome: QOL years after cosmetic surgery (2–5 years)*

Eight studies included assessment of QOL 2–5 years post-surgery. The studies showed that during this time, significant positive long-term effects of cosmetic surgery are no longer continuing to improve but are

maintained instead. For instance, in a large prospective multisite investigation of patient satisfaction and psychosocial status, Sarwer *et al*<sup>21</sup> found that most improvements were seen at 3 months following cosmetic surgery and were maintained through the 2-year follow-up period post-surgery.

Remarkably, although 26.9% of patients had a negative opinion of their abdominoplasty after 2 years, the percentage of patients who rated 5 areas of QOL as good or very good were as follows: sexual relations (74%), psychological status (86.5%), current life (100%), dressing (84.8%), and aesthetics (79.5%).<sup>34</sup> Similarly, even with a high rate of complications, patients who had abdominoplasty and mammoplasty performed after bariatric surgery<sup>28</sup> continued to maintain their QOL ratings 3–5 years later.<sup>34,37</sup>

***Comparison of QOL based on type of cosmetic surgery procedures: body vs. facial procedures***

Because facial modifications are often more readily apparent to others than modifications on other body parts, we analyzed the difference in QOL findings between the 2 categories to see if facial cosmetic surgery would produce QOL results different from those seen in other areas. In the comprehensive study by Klassen *et al*<sup>12</sup>, patient groups differed in the number of SF-36 dimensions that deviated from the general population prior to surgery. Non-facial procedures such as breast reduction and abdominoplasty differed from the general population significantly in 8 and 5 dimensions, respectively.<sup>12</sup> Pinnaplasty patients had significantly reduced social functioning and mental health scores, while rhinoplasty patients had significantly reduced general health perception scores.<sup>12</sup>

Surprisingly, although all the patient groups—breast reduction, breast reconstruction, other breast operations, pinnaplasty, rhinoplasty, and abdominoplasty—showed a statistically significant change in 2 or more health status areas following surgery, the breast reduction group was the only one that showed a moderate to large change in effect size on all health status measures.<sup>12</sup> It must be noted that reduction mammoplasty is generally considered a reconstructive procedure due to the relief of back pain that accompanies the post-operative course; it may have cosmetic benefits for some patients. All other groups, including the facial procedures, only demonstrated small to moderate improvements in certain aspects.<sup>12</sup> Therefore, facial cosmetic surgeries do not actually lead to the highest improvements in postoperative QOL; these procedures yielded similar changes in QOL as other procedures.

***Comment on the reviewed studies***

Examination of QOL before cosmetic surgery reveals that most studies showed a lower preoperative global



QOL in the treatment than in the control group. However, depending on the scale being used, some studies showed similar QOL ratings in both the treatment and community norm values.<sup>29</sup> Again, this may be due to the possibility that study groups did not actually differ in terms of QOL or due to a consequence of the different measurement strategies employed for assessing patient QOL, which emphasizes the need for cosmetic procedure-specific QOL scales across procedure types in future studies. Our review also explored QOL following cosmetic surgery. Many articles in the literature measured QOL before surgery as well as after surgery at various intervals. Despite the heterogeneity of the population and assessment tools, most studies show an improvement in QOL after cosmetic surgery procedures. Follow-up intervals, ranging from 1 month to 5 years, were important in our analysis. Shorter intervals are problematic when considering QOL because the immediate postoperative period involves healing, where the patient may still have reduced function, significant pain, aesthetic differences, and an inability to work or socialize normally. In addition, patients may encounter various opinions from their social network regarding the results of the procedure at different intervals. Such issues may potentially have an impact on QOL. For example, an individual's partner, friends, or family may be the only observers of the results during the first month, but when the patient goes back to work, goes on a date, or goes to the beach for the first time after the procedure, there may be different reactions and emotions generated from the other people around the patient. These events may not be captured by short-term follow up.

At short intervals, up to 6 months, many authors have noted improvements in the QOL of cosmetic surgery patients. Differing aspects of the studies, such as the use of various measures or body parts, need to be taken into consideration when attempting to generalize results.<sup>8,14-16,35</sup> For instance, although QOL and/or self-esteem improved following mastopexy,<sup>8,14-18,20,29</sup> abdominoplasty,<sup>34</sup> orthognathic surgery,<sup>30</sup> rhinoplasty,<sup>16</sup> rhytidectomy,<sup>16</sup> and blepharoplasty,<sup>16</sup> patients' post-operative QOL, in some studies, remained the same. The reason might be that the scope of QOL encompasses a wide range, including appearance, as well as satisfaction with life activities such as work, relationships, and leisure. Thus, it is possible for only 1 aspect of QOL to improve while the others stay the same or worsen with no significant improvement of the overall QOL after cosmetic surgery. For example, improvement in body image but not overall QOL or self-esteem in non-bariatric patients who underwent abdominoplasty<sup>35</sup> was consistent with the findings of a prospective, multisite investigation of patient satisfaction and psychosocial status following cosmetic surgery.<sup>21</sup>

Consequently, while individual facets that comprise QOL, such as body image, may improve post-procedurally, the patient's holistic measure of QOL may remain the same for some types of surgery. This complex relationship between cosmetic surgery and QOL has been noted by other authors.<sup>39,40</sup>

When QOL does improve post-procedurally, this improvement may be evanescent, as increasing time intervals can narrow the difference in QOL ratings demonstrated by the treatment group as related to age-matched control group.<sup>8</sup> In fact, this Swedish study<sup>8</sup> saw a disappearance of post-operative differences in QOL when compared to age-matched normal controls after one year, ie, QOL normalization. Fewer studies followed up with patients for years post-operatively, suggesting a need for more long-term studies. Of the few studies that did, the focus was primarily on self-esteem and appearance-related psychological variables.<sup>34,41,42</sup> This information highlights the importance of performing serial, cosmetic-specific QOL assessments post-procedurally in future studies.

Other authors have also noted the diversity and potential unreliability of QOL measures in studies of cosmetic surgery patients. Kosowski *et al*<sup>43</sup> systematically reviewed the literature to analyze questionnaires that measured contentment and QOL after facial cosmetic surgery or nonsurgical facial rejuvenation, concluding that many questionnaires used in studies "had undergone limited development and validation," while others were either constructed only from expert opinion or were lacking a published development process.<sup>43</sup> Furthermore, the content included in these questionnaires differed greatly, with none focused on procedure-related symptoms, procedural satisfaction, or pre-procedural patient education as discussed by Alderman *et al*.<sup>44</sup>

Similarly, Reavey *et al*<sup>45</sup> performed a systematic review of development, psychometric characteristics, and content of patient-reported outcome (PRO) measures that assess patient contentment and perception of body image or QOL after body contouring surgery. After subjecting the measures to appraisal for compliance with internationally-recommended guidelines, final five PRO measures, including one general measure Derriford Appearance Scale (DAS-59), one liposuction measure Freiburg Questionnaire on Aesthetic Dermatology and Cosmetic Surgery (FQAD), and three breast reduction measures: Breast Reduction Assessed Severity Scale Questionnaire (BRASSQ), Breast Related Symptoms questionnaire (BRS), and the BREAST-Q reduction module, were evaluated.<sup>45</sup> The authors concluded that except for certain instruments that measure outcomes of breast reduction, PRO measures for most other body contouring procedures are limited in their reliability, validity, and responsiveness.<sup>45</sup> Uniquely, for breast reduction outcome studies, there are adequate instruments

that can be used, such as the BRASSQ and BREAST-Q, both of which have been shown to be valid and to have good psychometric properties.<sup>45</sup>

Although most patients are satisfied with their cosmetic surgery results and show an improvement in QOL postoperatively, there are those who are not satisfied. Identification of such patients and addressing their difficulties, a priori, might be important. Honigman *et al*<sup>9</sup> identified the predictors of poor psychosocial or psychological outcome, and concluded that they should be used for screening in cosmetic surgery settings. These predictors include being young, being male, having unrealistic expectations of the procedure, previous unsatisfactory cosmetic surgery, minimal deformity, motivation based on relationship issues, and a history of depression, anxiety, personality disorder, and possibly body dysmorphic disorder.<sup>9</sup>

## Conclusions

Measuring QOL in cosmetic surgery patients is complex. We found that the procedures and tools employed in research studies were remarkably diverse, thus yielding difficulties with data analysis. Several groups who set out to report outcomes after cosmetic procedures concluded that studies lacked the criteria required for meta-analysis, and the assessment measures suffered from design, reliability, and responsiveness issues. However, we found that several important themes emerged from these diverse studies. Most data indicate that individuals undergoing cosmetic surgery began with lower values on aspects of QOL than control subjects. Furthermore, while a patient's QOL improved significantly post-procedurally, this effect appears to plateau with time. Although most studies reviewed here show that QOL improves after cosmetic surgery procedures, a more detailed analysis reveals that QOL assessment in cosmetic surgery needs significant refinement of measurement techniques, including developing cosmetic surgery-specific QOL measures. The ultimate success of healthcare interventions (cosmetic surgery included) lies not only in fixing the surgical, medical, surgical, or/and psychiatric problem at hand, but also improving patients' health status and QOL. Such conclusions represent a valuable starting point for further work on this important subject.

## Disclosures

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