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Review

The psychosocial outcomes following cosmetic surgery are largely unknown: A systematic review☆

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Summary *Introduction:* Cosmetic surgery is marketed and widely considered to exert positive psychosocial outcomes, particularly in relation to body image, self-esteem, and mental health. The present systematic review aimed to conduct a timely, up-to-date assessment of the existing academic empirical literature, applying stringent inclusion criteria to summarize only the highest quality of evidence in the field.
Methods: The following databases were systematically searched: EBSCO, Cochrane Library, Scopus, and ProQuest. Screening was completed by two independent reviewers. Prospective studies that utilized a control cohort to examine at least one psychosocial outcome using a validated measure after cosmetic surgery were included. Risk was double assessed using the Effective Public Health Practice Project Quality Assessment Tool.
Results: Seventeen studies met the inclusion criteria. There was considerable heterogeneity across research designs, control groups, measures, and statistical analyses. Overall, the quality of studies was poor. Results suggest short-term improvements in some psychosocial outcomes after cosmetic surgery (particularly in relation to body-area-specific satisfaction, self-esteem, sexual well-being and physical well-being), with limited and inconclusive evidence for outcomes such as mental health, holistic body image, quality of life and social functioning. Very few studies have explored psychosocial outcomes beyond 6-months after the surgery.
Conclusion: Current evidence regarding psychosocial outcomes following cosmetic surgery is weak. There is an urgent need to conduct high-quality research that will require collaboration among surgeons, research psychologists, and methodologists. Recommendations include pre-

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registration, larger sample sizes, longer follow-up duration, and appropriate control group recruitment. Considering the increasing popularity of cosmetic surgery globally, this field of research should assume priority.

Contents

Introduction

Cosmetic surgery refers to 'procedures that revise or change the appearance, color, texture, structure, or position of bodily features, which most would consider otherwise within the broad range of 'normal' for that person',[1] (p.6). Such procedures are primarily undertaken to 'enhance' physical appearance,[2] as opposed to improving health or body function. Although the aim of cosmetic surgery is similar to that of non-surgical cosmetic procedures, they differ in that cosmetic surgery requires medical incision, often under the effects of local or general anesthesia. Risks associated with cosmetic surgery include pain, injury, infection, scarring, loss of sensation, and mortality.[3–5] Despite this, the popularity of cosmetic surgery is increasing, with 15 million surgeries performed worldwide in 2022.[6] This industry is highly profitable; in 2023, the global market was valued at US$57.67 billion and is projected to grow to US $81.66 billion by 2032.[7]

The popularity of cosmetic surgery is attributable to several factors. Cosmetic procedures have become increasingly accessible, available, and affordable.[8] Recent

technological advancements along with faster recovery times have lowered patient's risk perception.[8] In addition, psychosocial factors are recognized to play a crucial role. For example, low self-esteem, poor body image and appearance anxiety are commonly associated with motivations to undergo cosmetic surgery.[9] Further, internalization of societal appearance ideals (the process wherein individuals adopt societal standards of beauty as their own personal beliefs), desire to increase self-confidence and improve social functioning, and reduce depression and anxiety symptoms are also key contributing factors.[10] Prospective patients often believe that surgically induced appearance changes will improve their psychosocial outcomes.[11] This belief is perpetuated through advertising, promotion, and marketing of cosmetic surgery.[12,13] For instance, surgical procedures are promoted on the premise that they will improve the consumers' attractiveness, consequently enhance their confidence, and reduce appearance anxiety. This marketing strategy emphasizes the primacy of psychosocial advantages over the physical health or functional benefits associated with other forms of surgical intervention.[12]

Therefore, it is crucial to establish if there is reliable evidence to support these claims and if there are unintended or unknown psychological consequences with potentially broader implications. To date, conclusions about the effectiveness of cosmetic surgery on psychosocial outcomes remain inconclusive and contradictory[14,15]; this could be explained in part by the methodological shortcomings of the reviewed studies. Indeed, the quality and heterogeneity of the primary studies that were included in previous reviews (i.e., the heterogeneity of methodologies used and populations studied) makes the interpretation of results unreliable. Further, many studies fail to utilize psychometrically validated measures (i.e., measures that show validity, reliability, and responsiveness). Such measures are essential to enable robust conclusions to be drawn.

Present study

An updated review to draw firmer conclusions on the impact of undergoing cosmetic surgery is timely. The aim of this study was to conduct a rigorous systematic review to examine the effects of cosmetic surgery on post-procedural psychosocial outcomes.

Method

This systematic review was conducted as per the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist.[16]

Eligibility criteria

The inclusion and exclusion criteria are presented in Table 1.

Search strategy

The following databases were searched up to September 2024: EBSCO, Cochrane Library, Scopus and ProQuest. No restrictions were exercised with respect to the publication date. Owing to the broad nature of the review, the search term string was complex and informed by previous published research.[14] The search string is available on request. Researchers with at least a postgraduate degree in the field of psychology screened the study titles for eligibility. Then, the first author and an additional researcher screened the abstracts and the full-text articles. The reference lists of included papers were searched; however, no additional studies were identified. The data screening process is presented as a PRISMA flow-chart in Fig. 1.

Data extraction

Data extraction was performed by the first author. Data were extracted for the period wherein both the intervention and control groups were assessed (i.e., if the intervention group were followed for longer than the control group, data extraction was limited to the point at which the control group completed their final assessment). In a similar manner, if a study used a combination of validated and unvalidated scales, only the data attributed to the validated scales were extracted.

Methodological quality assessment

Methodological quality was assessed using the Quality Assessment Tool for Quantitative Studies, developed by the Effective Public Health Practice Project (EPHPP).[17] Studies

Table 1 Inclusion and exclusion criteria.

Inclusion criteria	- Prospective quantitative design
	- Included a control group cohort that did not undergo any type of cosmetic surgery
	- Utilized at least one validated psychosocial measure with at least one pre- and post-operative assessment
	- Cosmetic surgery was conducted on adults (aged >18 y)
Exclusion criteria	- Non-English language publications
	- Non-peer-reviewed journals
	- Explicit statement that those undergoing cosmetic surgery had a diagnosis of body dysmorphic disorder
	- Explicit statement that surgery was undertaken for functional reasons
	- Surgeries considered reconstructive as opposed to esthetic
	- Studies funded by organizations that do not typically undertake surgery for esthetic reasons (e.g., The National Health Service, United Kingdom)

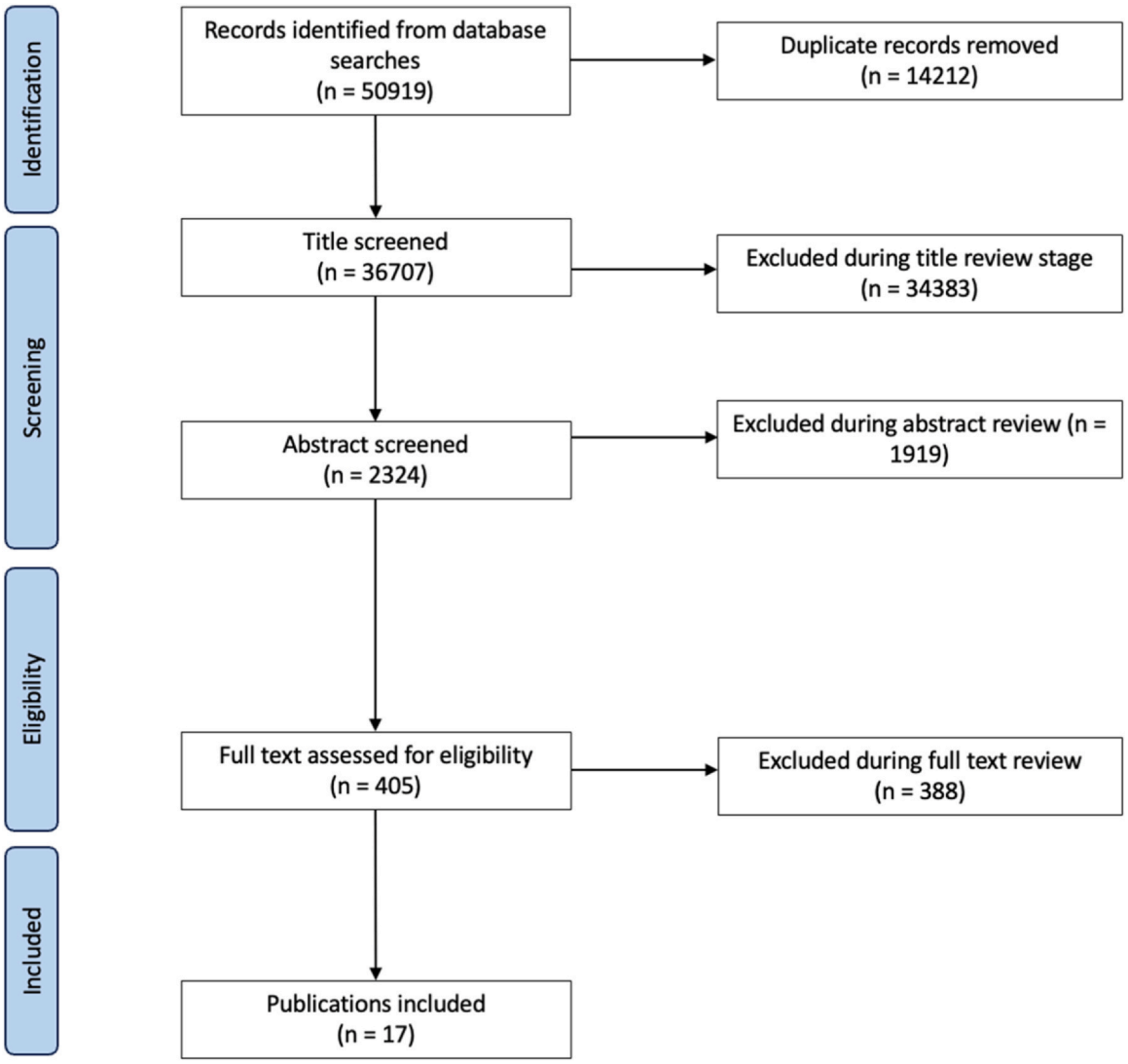

Fig. 1 Study inclusion Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram.

were rated on the following six parameters: selection bias, study design, confounders, blinding, data collection methods, withdrawal and dropouts. This resulted in an overall methodological score of 'strong' (i.e., no weak ratings), 'moderate' (i.e., one weak rating), or 'weak' (i.e., more than one weak rating). Given the varied study designs of the included papers, the EPHPP was considered the most appropriate quality assessment tool.[18] The EPHPP has excellent interrater reliability for overall scores as compared to the Cochrane Collaboration Risk of Bias Tool[19] and has established construct and content validity.[18] The lead author and one of three postgraduate researchers independently assessed each study to reach a consensus. Quality appraisal was based only on study aspects concerning psychosocial outcomes. Therefore, studies rated as low quality for this review may be considered high quality when considering research questions and respective data not relevant to the objectives of the present review.

Appraisal of the effectiveness of surgery on psychosocial outcomes

Cosmetic surgery was considered to have a psychosocial impact if there was a statistically significant change in any psychosocial measure for the intervention group, at any post-surgery time point, compared to that in the control group. In cases where this level of analysis was not performed (n = 11), other criteria were set; thus, these results must be interpreted cautiously. For studies that only examined within-groups effects (n = 5), an effect was reported if there was a significant difference in any one psychosocial measure at any point after the surgery in the intervention group but not in the control group. For studies that examined between-group effects only (n = 2), a significant effect was reported if the scores were not significantly different between groups at baseline but were

significantly different at any follow-up timepoint, or if significant differences existed between groups at baseline but became non-significant at any follow-up time point. For studies that examined between and within-group effects (n = 4), a significant effect was reported when either a between- or within-group effect was found, as reported above. This review reports both positive and negative changes in the psychosocial outcomes assessed.

Results

Seventeen journal articles that reported the results of 15 independent studies met the inclusion criteria of this review. Detailed information regarding the surgery type, sample characteristics, study characteristics, and results has been presented in Table 2.

Surgery type

Reduction mammaplasty (i.e., reduction in breast size and shape) was the focus of most studies (n = 7). Three studies examined a combination of surgeries. The remaining studies included the following: female genital cosmetic surgery (i.e., change in the shape and size of the labia; n = 3), rhinoplasty (i.e., change in the shape and size of the nose; n = 2), abdominoplasty (i.e., removal and/or tightening of skin and muscles around the stomach, sometimes referred to as 'tummy tuck', n = 1), and blepharoplasty (i.e., eyelid surgery; n = 1).

Sample characteristics

The mean age of the participants across studies ranged from 25 to 49 years. Twelve studies recruited women-only samples, and two predominantly recruited women (> 85% women).[20,29] Three studies had a relatively balanced sample of women and men.[21,32,36] None of the included studies reported having only male participants or any participants who identified as non-binary or gender-diverse. Participant samples were drawn from Europe (n = 8), South America (n = 5), the United States (n = 2), Asia (n = 1), and Oceania (n = 1).

Study characteristics

Only one study was pre-registered.[26] Research designs comprised cohort analytic (n = 12), randomized controlled trial (RCT: n = 4) and controlled clinical trial (n = 1). Control groups included inactive waitlists (n = 5), convenience samples (n = 5), individuals undergoing non-esthetic surgery (n = 4), individuals interested in cosmetic surgery who did not proceed (n = 2), and a population-based cohort (n = 1). Majority of the studies followed up participants for six months or less (n = 14). Remaining studies had follow-up assessment durations of up to 12 months (n = 1),[20] 20 months (n = 1),[34] and 11 years (n = 1).[25] Eight psychosocial constructs assessed by 50 validated psychosocial outcome measures, were utilized (Table 3).

The funding source was mentioned in six studies. Seven studies declared an absence of funding. Two studies cited partial funding by research councils for their data collection[25] or time.[28] Two studies declared funding via government[36] or plastic surgery providers.[20]

Only one study declared a conflict of interest whereby the senior author was a paid industry consultant.[34] In at least nine studies, the first and/or last author was surgeons.

Methodological quality of studies

Of the seventeen articles included in this review, 13 were classified as having high risk of bias, four as having a moderate risk, and none as low risk (Table 4). Widespread methodological limitations were identified with respect to blinding, selection bias, and study design. Limitations related to confounders, participant withdrawals, and dropouts were also identified.

Effectiveness of cosmetic surgery in improving psychosocial constructs

Body image

Six studies examined affective body image (i.e., thoughts and feelings towards one's body and appearance). Three studies found significant improvements as follows: at 1 month,[33] 3 months,[21] and 6 months.[27,33] In contrast, three studies found no improvements in body image, with follow-up timeframes ranging from 3 months to 11 years.[25,28,30] All the studies that examined general affective body image were rated as having a high risk of bias, except one that had a moderate risk of bias; this study examined a range of surgical procedures that found no improvements up to 11 years after surgery.

Area specific body satisfaction, focusing on the area of the body that was surgically altered, was examined in six studies; all these studies had a high risk of bias. All these studies found significant improvements at all follow-up time points as follows: 3 months,[28] 6 months,[24,27,36] 20 months,[34] and 24 months.[30]

Three studies examined symptoms of body dysmorphia. One study (moderate risk of bias) that examined a range of surgeries found improvements at 3, 6, and 12 months after the surgery.[20] A second study (high risk of bias) found improvements 6 months after the surgery.[27] Finally, one study (high risk of bias) found no improvement at 6 months, with improvements emerging at 12 and 24 months post-operatively.[30]

Mental health

Five studies measured depression. One study with a high risk of bias and another study with a moderate risk of bias showed improvements 6 months after post-reduction mammaplasty.[26,31] The remaining three studies found no reduction in symptoms of depression at 3 months (high risk of bias)[21,28] or at 3, 6, and 12 months (moderate risk of bias).[20]

Table 2 Study characteristics and results summary.

		Sample characteristics				Study characteristics			Significant findings	Non-significant findings
		Intervention group		Control group						
Author (y)	Surgery type	N	Gender/ Mean age (SD), range	N	Gender/ Mean age (SD), range	Design	Follow-up	Comparison group		
Studies that examined group-by-time interaction										
Margraf et al. (2013)[20]	Mix of esthetic surgeries	544	Women and men/NR[a]	264	Women and men/NR[a]	Cohort analytic	3 mo, 6 mo, 12 mo	Interested in surgery but did not proceed	Body dysmorphic symptoms (3 mo$^+$, 6 mo$^+$, 12 mo$^+$) Anxiety (3 mo$^+$, 6 mo$^+$, 12 mo$^+$) Self-esteem (3 mo$^+$, 6 mo$^+$, 12 mo$^+$) Quality of life (four measures) (3 mo$^+$, 6 mo$^+$, 12 mo$^+$)	Depression (3 mo, 6 mo, 12 mo) Social functioning (3 mo, 6 mo, 12 mo)
Moss & Harris (2009)[21]	Rhinoplasty, reduction mammaplasty, and upper limb	51	Women and men/29 (9), NR	107	Women and men/37 (10), NR	Cohort analytic	3 mo	Underwent surgery for non-esthetic reasons	General affective body image (rhinoplasty and reduction mammaplasty: 3 mo$^+$) Anxiety (3 mo$^+$)	General affective body image (upper limb surgery: 3 mo) Depression (3 mo)
Saariniemi, Keranan et al. (2008)[22]	Reduction mammaplasty	29	Women/46 (11), NR	35	Women/47 (10), NR	RCT	6 mo	Waitlist control	General mental health (6 mo$^+$) Physical well-being (6 mo$^+$) Quality of life (6 mo$^+$)	
Saariniemi, Sintonen et al. (2008)[23]	Reduction mammaplasty	29	Women/46 (NR), NR	Group 1 = 95 Group 2 = 102	NR/NR	Cohort analytic	6 mo	Group 1 hip replacement Group 2 knee replacement	Quality of life (when compared to control group 2; 6 mo$^+$)	Quality of life (when compared to control group 1; 6 mo)

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Table 2 (*continued*)

Author (y)	Surgery type	Sample characteristics: Intervention group N	Intervention group Gender/ Mean age (SD), range	Control group N	Control group Gender/ Mean age (SD), range	Study characteristics: Design	Follow-up	Comparison group	Significant findings	Non-significant findings
Sharp et al. (2016)[24]	Labiaplasty	29	Women/32, (10) NR	22	Women/36 (10), NR	Cohort analytic	6 mo	Convenience sample of those attending clinic for non-surgical reasons	Area specific body image (6 mo+)	General mental health (6 mo) Self-esteem (6 mo) Quality of life (6 mo) Sexual well-being (6 mo) Social functioning (6 mo)
Von Soest et al. (2012)[25]	Mixed of esthetic surgeries	71	Women/NR	1526	Women/NR	Cohort analytic	11 y	Population-based study. Comparison group are those that chose not to have surgery.	General mental health (11 y^{-}) Disordered eating behaviors (11 y^{-})	General affective body image (two measures; 11 y)
Studies that examined within and between groups effects										
Beraldo et al. (2016)[26]	Reduction mammaplasty	29	Women/30 (NR), NR	27	Women/35 (NR), NR	RCT	3 mo, 6 mo	Waitlist control	Depression (6 mo^{+}) Sexual Well-being (3 mo^{+}, 6 mo^{+})	Depression (3 mo)
Fonseca et al. (2018)[27]	Reduction mammaplasty	103	Women/34 (11), 18-55	103	Women/33 (11), 18—55	Cohort analytic	6 mo	Convenience sample of those attending outpatient gynecology family planning clinic	General affective body image (6 mo+) Area specific body image (6 mo+) Body dysmorphic symptoms (6 mo+)	
Veale et al. (2014)[28]	Labiaplasty	49	Women/ NR[b], 25—43	39	Women/ NR[b], 25—34	Cohort analytic	3 mo	Convenience sample of individuals enrolled in a university participant pool	Area specific body image (3 mo+) Anxiety (3 mo+) Sexual well-being (3 mo+)	General affective body image (3 mo) Depression (3 mo)
Viana et al. (2010)[29]	Eyelid surgery	50	Women and men/49 (6), NR	25	Women and men/48 (7), NR	Cohort analytic	6 mo	Convenience sample of university employees not desiring cosmetic surgery for the next six months.	Self-esteem (6 mo+)	

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Table 2 (*continued*)

Author (y)	Surgery type	Sample characteristics: Intervention group N	Intervention group Gender/ Mean age (SD), range	Control group N	Control group Gender/ Mean age (SD), range	Study characteristics: Design	Follow-up	Comparison group	Significant findings	Non-significant findings
Studies that examined between-group effects only										
Goodman et al. (2016)[30]	Female genital cosmetic surgery	120	Women/33 (10), 18–63	50	Women/33 (10), 18-58	Cohort analytic	6 mo	Convenience cohort obtained from investigator's gynecology and plastic surgery practices	General affective body image (6 mo$^+$) Area specific body image (6 mo$^+$) Sexual-well-being (6 mo$^+$)	Body dysmorphic symptoms (6 mo)
Saariniemi et al. (2009)[31]	Reduction mammaplasty	29	Women/46 (11), NR.	35	Women/47 (10), NR.	RCT	6 mo	Waitlist control	Depression (6 mo$^+$) Self-esteem (6 mo$^+$)	
Studies that examined within-group effects only										
Chowdhury et al. (2022)[32]	Rhinoplasty	24	Women and men/26 (NR), NR	24	Women and men/29 (NR), NR	Controlled clinical trial	6 mo	Underwent rhinoplasty for functional reasons	Self-esteem (6 mo$^+$)	
De Brito et al. (2010)[33]	Abdominoplasty	24	Women/34 (7), 26–50	15	Women/36 (4), 30–46	Controlled clinical trial	1 mo, 6 mo	Waitlist control	General affective body image (1mo$^+$, 6 mo$^+$) General mental health (two measures: 1mo$^+$, 1mo$^+$, 6 mo$^+$) Physical well-being (three measures: 1 mo$^+$, 1 mo$^+$) Self-esteem (1 mo$^+$, 6 mo$^+$)	General mental health (6 mo) Physical well-being (three measures: 1 mo, 6 mo, 6 mo, 6 mo) Quality of life (1mo, 6 mo) Social functioning (1 mo, 6 mo)
Elfanagely et al. (2021)[34]	Reduction mammaplasty	78	Women/40 (25), NR	22	Women/40 (26), NR	Cohort analytic	20 mo	Interested in reduction mammaplasty but did not proceed	Area specific body image (20 mo$^+$) General mental health (20 mo$^+$) Physical well-being (20 mo$^+$) Sexual well-being (20 mo$^+$)	

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Table 2 (*continued*)

Author (y)	Surgery type	Sample characteristics				Study characteristics			Significant findings	Non-significant findings
		Intervention group		Control group						
		N	Gender/ Mean age (SD), range	N	Gender/ Mean age (SD), range	Design	Follow-up	Comparison group		
Neto et al. (2008)[35]	Reduction mammaplasty	46	Women/32 (11), NR	46	Women/32 (10), NR	RCT	6 mo	Waitlist control	Physical well-being (6 mo^{+}) Self-esteem (6 mo^{+})	
Robin et al. (1988)[36]	Rhinoplasty	22	Women and men/25 (8), 18–45	22	Women and men/25 (8), 18–45	Cohort analytic	6 mo	Underwent surgery for non-esthetic reasons	Area specific body image (6 mo^{+})	

Abbreviations: SD = standard deviation, mo = months. NR = not reported.
Notes: $^{+}$ Positive impact of cosmetic surgery. $^{-}$ Negative impact of cosmetic surgery. [a] This study did not report mean age (SD) or age range but instead reported the age brackets of participants (the youngest age bracket was 18-24 years, and the eldest was 45-65 years, for both conditons). [b] This study did not report mean age (SD) but instead reported median age (34 for the intervention group and 28 for the control group).

Anxiety was examined in three studies; all these studies reported short-term improvements. Two studies with a high risk of bias reported improvements 3 months post-operatively.[21,28] One study with a moderate risk of bias examined a range of cosmetic surgeries and found improvements at 12 months follow-up.[20]

Finally, five studies, four with a high risk of bias, utilized at least one holistic measure of mental health. Two studies found improvements at all timepoints ranging from 6 to 20 months,[22,34] with another finding no improvements at 6 months post-operatively.[24] One study utilizing two measures of mental health found improvements at 1 month (but not at 6 months) for one measure, and improvements at both 1 and 6 months for the second measure.[33] Finally, one study with a moderate risk of bias examined a range of surgeries that reported a negative impact on mental health 11 years post-surgery.[25]

Physical well-being

Four studies with a high risk of bias included at least one measure of physical well-being. Three reported improvements, either at 6 months[22,35] or at 20 months after the surgery.[34] The fourth study found improvements at the 1-month follow-up, which was not maintained at 6 months; a second measure of physical well-being did not improve at any timepoint.[33]

Self-esteem

Seven studies (two moderate and five high risk of bias) measured self-esteem. Six of these reported positive improvements in self-esteem at all time points; the maximum follow-up duration was 6 months for five studies,[29,31-33,35] and 1 year for one study.[20] One study with a high risk of bias reported no improvements in self-esteem following labiaplasty.[24]

Quality of life

Five studies included at least one measure of the quality of life. Two of these found improvements at 3, 6, and 12 months across four measures[20] and at 6 months of follow-up.[22] Another study found improvements at 6 months in patients who underwent cosmetic surgery when compared to those who underwent knee replacement, but no improvements when compared to those who underwent hip replacement.[23] Finally, two studies found no improvements up to 6-month follow-up.[24,33] All studies measuring quality of life were high risk of bias, except the trial by Margraf et al.[20] that had a moderate risk of bias and reported positive improvements up to 1 year post-operatively in a group who had undergone various surgeries.

Sexual well-being

Sexual well-being was measured in five studies. Four of these reported significant improvements in sexual well-being at 3 months,[28] 6 months,[26] 20 months,[34] and 24 months after the surgery[30]; all of these studies had a high risk of bias except one which had a moderate risk of bias.[26] The final study (high risk of bias)[24] reported no significant improvements.[24]

Table 3 Validated measures utilized in included studies.

Psychosocial construct	Measure	Included studies utilizing measure
Body image		
General affective body image	Body Esteem Scale[37]	30
	Body Image Quality of Life Questionnaire[38]	28
	Body Investment Scale[39]	27
	Body Shape Questionnaire[40]	33
	Body-Self Relations Questionnaire (Body Areas Satisfaction subscale)[41]	25
	Derriford Appearance Scale[42]	21
	Self-Perception Profile for Adolescents (Physical Appearance subscale)[43]	25
Area specific body image	Breast Evaluation Questionnaire[44]	27
	BREAST-Q (Satisfaction with Breasts subscale)[45]	34
	Facial Appearance Sorting Test[46]	36
	Female Genital Self-Image Scale[47]	30
	Genital Appearance Satisfaction Scale[48]	24,28
Body dysmorphic symptoms	Body Dysmorphic Disorder Examination[49]	27
	Body Dysmorphic Disorder Yale-Brown Obsessive-Compulsive Scale[50]	30
	Dysmorphic Concerns Questionnaire[51]	20
Mental health		
Depression	HADS (Depression subscale)[52]	28
	RBDI mood questionnaire (Depression subscale)[53]	21,26,31
	Symptom Checklist—90-Revised (Depression subscale)[54]	20
Anxiety	Beck Anxiety Inventory[55]	20
	Crown-Crisp Experiential Inventory (Anxiety subscale)[56]	21
	HADS (Anxiety subscale)[52]	28
General mental health	BREAST-Q (Psychological Well-being subscale)[45]	34
	Hopkins Symptom Checklist[54]	24,25
	SF—36 (Role Emotional subscale)[57]	33
	SF—36 (Mental Health summary score)[57]	22
	SF—36 (Mental Health subscale)[57]	33
Physical well-being		
	BREAST-Q (Physical Wellbeing subscale)[45]	34
	Roland Morris Questionnaire[58]	35
	SF—36 (Energy subscale)[57]	33
	SF—36 (Physical Functioning subscale)[57]	33
	SF—36 (Physical Summary score)[57]	22
	SF—36 (Role Functioning subscale)[57]	33
Self-esteem		
	RBDI mood questionnaire (Self-esteem subscale)[53]	31
	Rosenberg Self-Esteem Scale[59]	20,24,29,32,33,35
Quality of life		
	Bern Questionnaire on Subjective Well-Being (Joy in Life subscale)[60]	20
	Bern Questionnaire on Subjective Well-Being (Positive Attitude to Life subscale)[60]	20
	EuroQoL 5D[61]	20,22
	EuroQoL 6[61]	20
	Satisfaction with Life Scale[62]	24
	SF—36 (General health subscale)[57]	33
	15D[63]	23
Sexual well-being		
	BREAST-Q (Sexual Well-being subscale)[45]	34
	Female Sexual Function Index[64]	26
	Index of Sexual Satisfaction[47]	30
	Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire[65]	28

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Table 3 (*continued*)

Psychosocial construct	Measure	Included studies utilizing measure
	Sexual confidence Scale[66]	24
Social functioning		
	Liebowitz Social Anxiety Rating Scale[67]	20
	SF−36 (Social function)[57]	33
	Relationship Assessment Scale[68]	24
Disordered eating behaviors		
	Eating Attitudes Test−26[69]	25

Abbreviations: RBDI = Raitosalo's Beck Depresion Inventory, SF-36 = 36-item Short Form Health Survey, HADS = Hospital Anxiety and Depression Scale.

Social functioning

Three studies measured social functioning. All three found no improvements at 6 months[24]; 3, 6, and 12 months[20]; or 1 month and 6 months after the surgery.[33] All studies had a high risk of bias, except the study by Margraf et al. that had a moderate risk of bias[20] that reported no significant improvements 12 months after the surgery.

Disordered eating behaviors

One study with a moderate risk of bias included a measure of disordered eating behaviors and found that those who underwent cosmetic surgery had increased disordered eating behaviors at 11 years follow-up.[25]

Discussion

Previous reviews examining psychosocial outcomes following cosmetic surgery have highlighted the issue of low-quality evidence in this research area.[14,15] The current study aimed to conduct an updated systematic review to report the highest quality of research across the field of cosmetic surgery and psychosocial outcomes. Despite the use of stringent inclusion criteria, including the use of prospective designs, longitudinal control groups, and validated measures, this review continues to highlight the scarcity of high quality research in this field. The included studies suggest that cosmetic surgery improves, or at least does no harm, to several psychosocial outcomes in the short-term (i.e., 6 months after surgery) at the group level. However, few studies have examined psychosocial outcomes beyond 6 months post-surgery; therefore, there is very limited evidence regarding the long-term benefits or consequences of cosmetic surgery.

General findings of included studies

Notwithstanding the methodological issues observed across the included studies (discussed in detail below), some

Table 4 Methodological quality assessment of studies included in the review, using the Effective Public Health Practice Project (EPHPP).

Author/year	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawal and Dropouts	Global Quality Rating
Beraldo et al., (2016)[26]	2	1	1	3	1	1	Moderate
Chowdbury et al., (2022)[32]	2	2	3	2	1	3	Moderate
Margraf et al., (2013)[20]	1	2	1	3	1	2	Moderate
Von Soest et al., (2012)[25]	3	2	1	2	1	2	Moderate
de Brito et al., (2010)[33]	3	1	3	3	1	1	Weak
Elfanagely et al., (2021)[34]	3	2	1	3	1	2	Weak
Fonseca et al., (2018)[27]	3	2	1	3	1	1	Weak
Goodman et al., (2016)[30]	2	2	3	3	1	3	Weak
Moss & Harris (2009)[21]	3	2	3	3	1	3	Weak
Neto et al., (2008)[35]	2	1	3	3	1	1	Weak
Robin et al., (1988)[36]	2	2	3	3	1	2	Weak
Saariniemi et al., (2009)[31]	3	1	1	3	1	2	Weak
Saariniemi, Keranen et al., (2008)[22]	3	1	1	3	1	2	Weak
Saariniemi, Sintonen et al., (2008)[23]	3	2	1	3	1	1	Weak
Sharp et al., (2016)[24]	3	2	1	3	1	3	Weak
Veale et al., (2014)[28]	3	2	1	3	1	3	Weak
Viana et al., (2010)[29]	2	2	3	3	1	1	Weak

Quality Ratings: 1 = Strong (i.e., low risk of bias), 2 = Moderate (i.e., risk of bias), 3 = Weak (i.e., high risk of bias).

patterns emerged. First, results concerning some psychosocial outcomes were more consistent than others. In line with previous reviews,[70] all-but-one study measuring self-esteem reported improvements, although no study assessed the effects beyond 12 months of surgery. A similar pattern was observed for outcomes related to sexual-well-being; majority of the studies reported positive outcomes for up to 2 years post-operatively. In a similar manner, the findings related to physical well-being were positive in almost all studies, potentially owing to the functional aspects of some procedures included in this review (e.g., reduction mammaplasty). Findings for other constructs, such as quality of life and social functioning, yielded mixed results, with some showing improvements and others demonstrating no effect. No study included in this review evaluated these outcomes beyond 12 months after surgery. With respect to body image, findings suggest that cosmetic surgery improves satisfaction with the specific area of the body that is altered by surgery; however, contradictory results were observed when holistic body image was considered. Findings regarding mental health were also inconclusive. There was more evidence in favor of the positive outcomes of cosmetic surgery on anxiety than depression; however, in sum, the research reports are conflicting. It is noteworthy that the study with a substantially longer follow-up duration reported that individuals who underwent cosmetic surgery had poorer mental health 11 years post-operatively than those who did not undergo surgery,[25] suggesting that cosmetic surgery may only temporarily alleviate mental health distress. The same study also reported higher prevalence of eating disorders in those who underwent surgery than in those who did not at 11 years post-operatively; this was the only study to consider disordered eating as an outcome.

Methodological summary of included studies

Conducting RCTs on the subject of cosmetic surgery is challenging and involves coexisting practical and ethical complications.[71] As expected, the majority of studies included in this review were not RCTs. Non-equivalent group designs using pre-existing groups were often utilized, with the associated challenges of identifying the most appropriate control group and addressing potential confounding factors. Many studies in this review did not incorporate confounders, such as marital status, gender, health status, and previous surgeries undertaken, in their analyses. Selection bias, participant withdrawal and participant dropout were issues observed across studies, severely limiting the generalizability of the reported findings. Finally, and perhaps most difficult to overcome in future research, was lack of blinding across studies. Every study failed to disclose information regarding the blinding of study participants and/or outcome assessors, resulting in performance bias. Considering that cosmetic surgery is elective, expensive and commonly self-funded, those undergoing cosmetic surgery are likely to exert a high degree of performance bias that is not accounted for in the reviewed studies.

In general, included studies were characterized by no pre-registration and no pre-study justification for sample size, either through a prior reasoned power calculation or otherwise. Majority of the studies included a small sample size, potentially in anticipation of strong post-operative effects. However, the resulting small datasets have adversely affected the representative nature of the study and the generalizability of the results.

Many studies utilized multiple outcome measures (MOMS) often recorded at multiple points in time. MOMS and multiple time points should be encouraged because they have the potential to offer greater insight and can be cost effective. However, uncontrolled statistical hypothesis testing on MOMS at multiple timepoints could lead to an over-estimation of Type-I error. Debates relating to corrections for multiple-hypothesis testing continue in the literature and Bonferroni styled corrections used in one study[21] may have led to an over correction. Thus, studies with protocols that pre-declare whether they are hypothesis-driven or exploratory with well-defined questions would facilitate result interpretation and prevent the over-capitalization of idiosyncratic chance findings that may fail to replicate as discussed in the so-called replication crisis.[72]

Data loss is not an unusual occurrence and is expected in prospective longitudinal studies. Studies in the review did not always explicitly report on missing data or explain the mechanism for handling data loss.[23,26,29,35,36] Further details would offer an indication of the potential extent of bias in data reporting. A principled approach to the consideration of data missing not at random considerations is absent from the reviewed studies. One study used imputation; however, it is unclear whether their results were based on imputed data or as some form of validation.[20] In a similar manner, valid but unusual aberrant data points will be expected in prospective studies, and these outliers may particularly influence statistical results in studies with a small sample size, potentially obscuring otherwise real effects or more generally misstating the effect size. Data screening and treatment of outliers was variable throughout the studies.

Baseline covariate adjusted analyses or group-by-time interactions with an assessment of within-group changes are important to evaluate group comparisons. However, several studies examined within-group changes only and qualitatively compared groups to draw conclusions.[32,33,35,36,70] It is noteworthy that when this was done, sample sizes, means and standard deviations were presented, allowing a statistically literate person to assess the interaction effects that were not directly reported.

In general, there was wide variation in the methodological and statistical practices, and the studies often lacked attention to detail in the reporting, possibly owing to stringent journal word counts. This has been identified as a common issue across surgical literature, and calls for standard reporting guidelines are ongoing[73] in addition to collaborative efforts between surgeons and methodologists to increase trial rigor.[71]

Limitations

In addition to the quality issues discussed above, collectively, the multifactorial nature of the motivations to undergo cosmetic surgery presents challenges in interpreting the results of studies in this field. Only three studies

explicitly reported the participants' motivations for surgery.[21,24,32] This is a significant omission because some surgeries included in this review may have been undertaken predominantly for functional reasons (e.g., reduction mammaplasty), potentially obscuring the outcomes for other surgeries that could have been undertaken primarily for esthetic reasons. In fact, in some instances, it was challenging to identify whether surgeries were 'cosmetic' and therefore relevant for this review. For example, would body contouring after bariatric surgery be deemed cosmetic or functional? In a similar manner, should it be assumed that studies funded by organizations that do not typically perform cosmetic surgeries are reporting on surgeries undertaken for functional reasons? When these cases arose during the literature search for this review, the studies were excluded.[74,75] Second, a plethora of psychosocial outcomes measures were utilized. Ensuring consistency across measures would enable cross-study comparisons. Patient-reported outcome measures (e.g., BREAST-Q)[45] hold particular promise. Third, most studies failed to follow-up participants beyond 6 months of the surgery despite recommendations that this is the earliest point at which psychosocial outcomes should be measured, owing to recovery times and the increased presence of cognitive dissonance (the discomfort someone feels when their behaviors and feelings do not align).[76,77] The 11-year follow-up findings of one study included in this review[25] contradict the other results in this review, suggesting the need for further examination of the longer-term outcomes following cosmetic surgery. Fourth, some of the most popular cosmetic surgeries (e.g., breast augmentation) and increasingly popular procedures (e.g., buttock augmentation and lower body/thigh lifts) are absent from the literature reviewed here because they did not meet the stringent inclusion criteria. Fifth, this review underscores a dearth of literature among men, non-binary groups, and individuals from non-Western contexts. Finally, while not examined in this review, qualitative explorations of the nuances of psychosocial outcomes following cosmetic surgery would complement the research summarized in this review.

Strengths

The findings of this review are timely. With a global increase in the popularity of cosmetic surgery,[6] there is an urgent need to understand the outcomes from a psychological perspective. This systematic review benefitted from a dual screening process for inclusion, stringent inclusion criteria that collated only the most rigorous evidence, and the use of a validated risk of bias tool appropriate for the included studies. The review included published studies from the broad field of cosmetic surgery. It could be argued that a series of reviews separately assessing specific surgical procedures would be more appropriate; however, the present study was designed to examine the quality of research across the field.[14,15] In addition, no obvious patterns emerged in the results regarding surgery type, although an in-depth examination of this was beyond the scope of the current review. It is hoped that more robust evidence in the future will facilitate a more granular examination regarding the psychosocial outcomes of specific cosmetic surgeries.

Conclusion

To date, research on the psychosocial outcomes following cosmetic surgery is methodologically weak, and therefore, accurate conclusions have not been established. To make evidence-based recommendations to both patients and surgeons, there is a need for pre-registered, rigorously designed longitudinal research studies measuring hypothesis-driven psychosocial outcomes with long-term (2 years+) assessment points. Research designs, such as multi-group Interrupted Time Series or propensity score matching, could be particularly valuable. Conducting high-quality work in this area is challenging; however, it is a necessary and possible endeavor.[78,79] Concerted collaborative efforts from surgeons, researchers, editors, funders, and regulatory bodies is paramount to ensure that an appropriate evidence base is established to inform guidelines, protocols, or decision-making tools to ensure the best possible outcomes for those undergoing cosmetic surgery. In addition, there is an urgent need to substantiate or unsubstantiate advertising and marketing claims about the benefits of cosmetic surgery that are currently remaining unchecked.

Ethical approval

This study was performed in line with the principles of the Declaration of Helsinki. Ethics committee approval was not required.

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CRediT authorship contribution statement

Kirsty Garbett: Conceptualization; formal analysis; investigation; methodology; visualisation; project administration; writing (original draft, writing, review and editing); and funding acquisition. **Nicole Paraskeva:** Conceptualization, methodology, and writing (original draft). **Harriet Smith:** Formal analysis, investigation, resources, and writing (review and editing). **Paul White:** Formal analysis and writing (review and editing). **Helena Lewis-Smith:** Conceptualization, methodology, and writing (review and editing). **Jason Anquandah:** Formal analysis and writing (review and editing). **Phillippa Diedrichs:** Conceptualization, methodology, supervision, and writing (review and editing).

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Conflicts of interest

The authors declare no conflict of interest in relation to this work.

Registration and protocols

This study has not been registered. The PRISMA guidelines were followed.

Appendix A. Supporting information

Supplemental data associated with this article can be found in the online version at doi:10.1016/j.bjps.2025.03.013.

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