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Desire for Body Contouring Surgery after Bariatric Surgery: A Nationwide Cross-sectional Study in Saudi Arabia

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Background: The obesity pandemic in Saudi Arabia has led to a high demand for bariatric surgery (BS). Post-BS patients experience rapid and massive weight loss, with most patients experiencing redundant skin, leading to a desire for body contouring surgery (BCS).

Methods: A cross-sectional study was conducted from September 2022 to May 2023 among patients who underwent BS in Saudi Arabia, using an online self-administered questionnaire. The questionnaire comprised sociodemographic data, weight, and BS-related questions, and the post-BS appearance questionnaire assessed the desire for BCS, excess skin satisfaction, and overall appearance.

Results: A total of 410 of the patients electively enrolled. The mean perceived satisfaction of post-BS patients with the body's excess skin was rated as 4.28 ± 1.69 out of 7 points. The overall desire for BCS among the post-BS population was equal to a collective mean desire of 2.10 ± 0.92 out of 4 points. The desired body sites for BCS were focused on the abdomen/waist, followed by the lower back, then upper arms, buttocks, and thighs. Only 25.1% of the patients fulfilled their desires and recently underwent BCS.

Conclusions: The study highlights the importance of incorporating plastic and reconstructive surgery as an integral part of the multidisciplinary approach to morbidly obese patients after BS and the need for national guidelines on the referral pathway for post-BS BCS. *(Plast Reconstr Surg Glob Open 2023; 11:e5483; doi: 10.1097/GOX.0000000000005483; Published online 14 December 2023.)*

INTRODUCTION

The epidemic of obesity has been tremendously increasing over the past decade. According to the American Society for Metabolic and Bariatric Surgery, 256,000 Americans underwent weight loss surgery in 2019 alone.[1] Saudi Arabia has a high rate of obesity, even higher than the global average. The weighted prevalence of obesity is estimated to be 35.6% (Saudi Arabia) versus 13% (global average).[2] As a result, bariatric surgery (BS) has become highly demanded as a definitive solution for obesity and its subsequent morbidities.[3] BS involves several procedures, including gastric bypass, adjustable gastric banding, and biliopancreatic diversion.[4]

The medical benefits of weight loss are numerous. However, rapid and significant weight loss may have negative consequences. Post-BS, patients may experience rapid and massive weight loss, defined by Shermak et al as loss of excess weight of 50% or more of the ideal body weight.[5] In the event of significant weight loss in a short period, the skin does not shrink effectively, leading to contour irregularities caused by redundant skin and residual adiposities.[6] As a solution and to enhance the overall outcome, body contouring surgery (BCS) plays a role in complementing and optimizing BS results.[7]

A thorough review of the literature by Jiang et al identified 24 studies representing 6867 patients, with a range of 74% to 95.4% of patients who had undergone BS desiring BCS.[8] Another study conducted in Norway compared BS patients who desired, underwent, or did not desire BCS at 5-year intervals after BS showed that depressive symptoms and body dissatisfaction were higher among

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those who desired BCS without undergoing the procedure.[9] Studies that shared our objectives were predominantly conducted in Western countries, limiting their conclusions' universal applicability. Considering each country's unique social and cultural aspects, the present study was conducted to assess the desire for BCS in patients who underwent BS in Saudi Arabia, with the optimal goal of understanding the patients' needs and desired aesthetic outcomes.

Takeaways

Question: What is the prevalence and desire for body contouring surgery (BCS) after bariatric surgery (BS)?

Findings: This cross-sectional study revealed that a substantial number of postbariatric surgery patients desired BCS to manage skin redundancy with a cumulative mean of 2.10 of 4, and only a quarter of the patients fulfilled their desire.

Meaning: Our results show the importance of incorporating plastic and reconstructive surgery as an integral part of the multidisciplinary approach to morbidly obese patients after BS and the need for national guidelines on the referral pathway for post-BS BCS.

PATIENTS AND METHODS

Before commencement, research ethical approval was obtained from the institutional review board of Princess Nourah bint Abdulrahman University (No. 22-1174).

Sample and Data Collection

This online survey-based cross-sectional study used a convenience sampling technique with national coverage. The study was conducted from September 2022 to May 2023. The inclusion criteria were post-BS patients residing in Saudi Arabia who were 18 years old or older and whose surgery occurred at least 1 year ago or more; otherwise, they were excluded from the study. No gender restrictions were applied. Study participants were recruited from the five major regions in Saudi Arabia. Data collectors who resided in the corresponding region distributed the survey to ensure a representative sample. Furthermore, the BS union in Saudi Arabia was contacted and aided in the distribution of the questionnaire. All participants gave electronic informed consent. The sample size was estimated with a margin error of 5% and a confidence level of 95%; the minimum sample size required was 323 participants, as computed by EpiTools.

Study Survey

The Post-Bariatric Surgery Appearance Questionnaire (PBSAQ) is a self-reported questionnaire developed by Mitchell et al.[10] and was modified for the current study. The survey included questions related to cosmetic and body contouring issues after BS and took approximately 6 minutes to complete. The Arabic PBSAQ was used after conducting the appropriate forward-backward translation steps. The study instrument had three sections. (1) Sociodemographic data questions included age, gender, nationality, current residency, marital status, education level, occupation status, household income, and tobacco use. (2) General questions related to participants' BS and weight asked about their height, weight before BS, the lowest weight achieved after BS, current weight, the timing of their BS, obesity as a child/adolescent, and the type of procedure. (3) Desire and satisfaction assessment using the PBSAQ was divided into six subsections: A, overall appearance evaluation using a nine-point Likert scale; B, current level of satisfaction with the excess skin in a specific body area after BS (face, chin and neck, upper arms, upper back, lower back, chest, breast, waist, abdomen, calves, thighs, and buttocks) on a seven-point Likert scale; C, previous BCS after BS; D, desire for BCS in specific body regions; E, degree of expected improvement from BCS; and F, level of satisfaction with excess skin before BCS on a five-point Likert scale.

Statistical Analysis

The mean and SD were used to describe continuous variables, and the median and the interquartile range were used to describe continuous variables with statistical evidence of skewness. The frequency and percentage were used to describe categorical variables. The Kolmogorov-Smirnov statistical test and histograms were used to assess the statistical normality assumption of metric variables. Cronbach alpha (α) test was used to assess the internal consistency. Pearson (r) bivariate correlations test assessed the correlations between metric-measured variables. The exploratory factor analysis, principal axis factoring, parallel analysis, and scree-plot tests were used to assess the dimensionality of questionnaires. The multivariable binary logistic regression analysis was applied to dichotomous binary outcomes (odds of previous BCS), and the association between predictor-independent variables with their analyzed outcomes was expressed as multivariable adjusted odds ratios (ORs) with associated 95% confidence intervals. The multivariable linear regression analysis was applied to assess the significance of the predictors for the BS patients' mean of the perceived desire for BCS and body image satisfaction scores; the association between the analyzed predictor variables with these outcome variables was expressed as beta-coefficients (β) with 95% confidence limits. The SPSS IBM statistical software version 21.0 (SPSS, Inc., Chicago, Ill.) and the stand-alone factor analysis program (FACTOR-9.2)[11] were used for statistical computing and analysis. The alpha significance level was considered at 0.05.

RESULTS

An estimated 410 adults residing in Saudi Arabia had enrolled themselves electively and completed the study questionnaire. The internal consistency analysis showed that the 11-item desire for BCS questionnaire was read

Table 1. Descriptive Analysis of the Bariatric Surgery Patients' Sociodemographic Characteristics (n = 410)

	Frequency	Percentage
Sex		
Male	157	38.3
Female	253	61.7
Age		
8–25 years	119	29
26–30 years	79	19.3
31–35 years	83	20.2
36–40 years	51	12.4
41–45 years	42	10.2
≥46 years	36	8.8
Marital state		
Single	185	45.1
Married	198	48.3
Divorced	21	5.1
Widowed	6	1.5
Educational level		
School (primary, intermediate, high schools)	65	15.9
University degree	301	73.4
Higher studies	44	10.7
Household monthly income in SAR/month		
<5000 SAR/month	129	31.5
5000–10,000 SAR/month	127	31
>10,000 SAR/month	154	37.6
Employment state		
Unemployed	30	7.3
Housewife	49	12
Student	89	21.7
Employed	231	56.3
Retired	11	2.7
Residence region		
Central region	131	32
Eastern region	84	20.5
Western region	85	20.7
Northern region	50	12.2
Southern region	60	14.6

and understood by the participants equally and reliably (Cronbach alpha = 0.928). Likewise, the 10-item satisfaction with excess skin questionnaire was also reliable (Cronbach alpha = 0.947).

The participants' sociodemographic characteristics are displayed in Table 1. In the sample, the mean ± SD age in years for the participants was 32.53 ± 9.82; 61.7% were women, 48.1% were married, 73.1% had a university degree, and 56.3% were employed.

Table 2 displays the descriptive analysis of the patients' history of obesity and BS-related outcomes and measures. The yielded findings showed that 28% of BS patients are tobacco smokers, 36.8% were currently overweight, 46.1% were considered overweight/obese as a child, and 69.8% reported being overweight/obese as an adolescent. The patients' mean body weight before BS was 110.23 ± 22.63 kg, and the least achieved mean body weight post-BS was 72.94 ± 15.56 kg. Furthermore, 33.7% had high expected bodily improvements after BCS. Regarding the types of BS, the majority had a sleeve gastrectomy (83.4%). The findings showed that 25.1% of the patients had recently undergone BCS. The

Table 2. Descriptive Analysis of the Patients' History of Obesity, Anthropometric Measures, and Bariatric Surgery Outcomes

	Frequency	Percentage
Smoking habit		
No	295	72
Yes	115	28
Current body weight (kg), mean (SD)		76.30 (17.10)
Body height (cm), mean (SD)		165.63 (9.41)
Current BMI score, mean (SD)		27.72 (5.32)
Current BMI level		
Underweight	18	4.4
Normal	119	29
Over weight	151	36.8
Obese class I	93	22.7
Obese class II	29	7.1
Obesity as a child		
No	221	53.9
Yes	189	46.1
Obesity as a teenager		
No	124	30.2
Yes	286	69.8
Body weight before bariatric surgery (kg), mean (SD)		110.23 (22.63)
Least achieved body weight postbariatric surgery (kg), mean (SD)		72.94 (15.56)
Percentage of lost body weight postbariatric surgery (SD)		37.30 (19.40)
Type of undergone bariatric surgery		
Gastric banding	14	3.4
Gastric bypass	26	6.3
Intragastric balloon	28	6.8
Sleeve gastrectomy	342	83.4
Duration years since bariatric surgery, median (IQR)		3.24 (4)
Self-rated current appearance satisfaction, median (IQR)		7 (4)
Have you ever had body contouring surgery?		
No	307	74.9
Yes	103	25.1
No. previous body contouring surgical sites		
None	307	74.9
1–2 body sites	81	19.8
3–4 body sites	14	3.4
≥5 body sites	8	2
Degree of expected improvement from body contouring surgery, mean (SD)		3.66 (1.22)
Degree of expected improvement from body contouring surgery		
None	17	4.1
Very low	11	2.7
Low	17	4.1
Some improvement	117	28.5
High	138	33.7
Very high	110	26.8

BMI, body mass index.

operated body sites are shown in Figure 1. Regarding participants' satisfaction with BCS outcomes, findings showed that 16.8% were very satisfied, 36.4% were satisfied, 25.9% were dissatisfied, and 20.9% were very dissatisfied.

Table 3 displays findings for the bariatric patients' mean perceived satisfaction with excess skin and their BCS

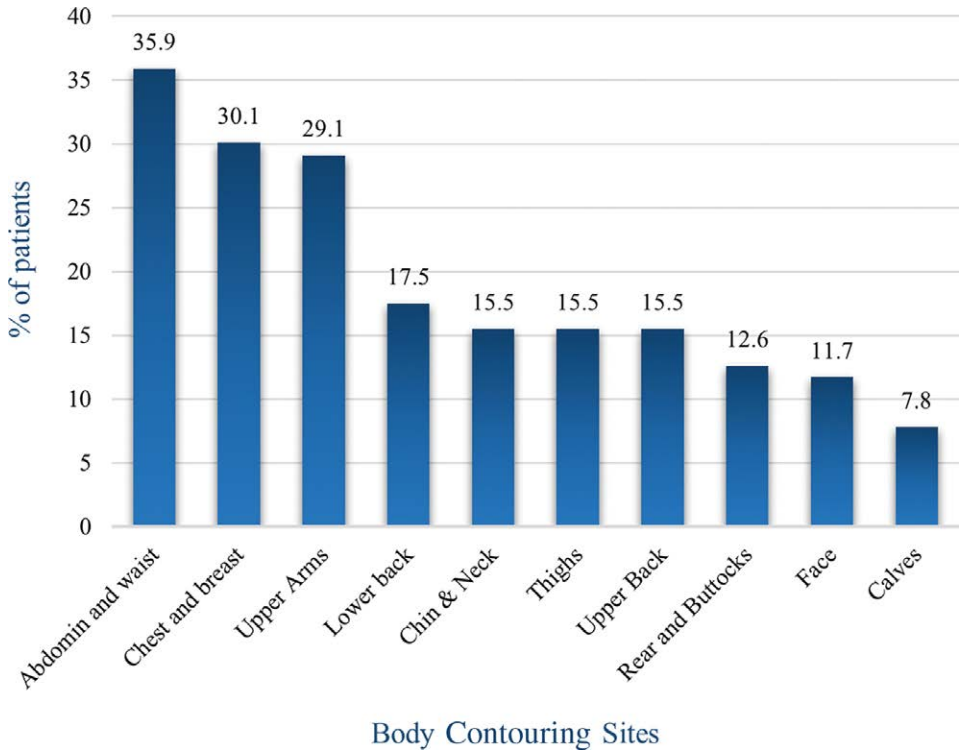

Fig. 1. The patients' body sites previously operated on with body contouring surgery (n = 103).

Table 3. Descriptive Analysis of the Patients' Perceptions of Body Image Satisfaction and Desire for Body Contouring Surgery for Various Body Sites

	A. Mean (SD): Satisfaction Maximum Possible Score (1–7 Points)	B. Mean (SD): Surgical Contouring Desire Maximum Possible Score (1–4 Points)
Face	4.98 (1.97)	1.83 (1.18)
Chin and neck	4.85 (2.04)	1.86 (1.15)
Upper arms	3.82 (2.03)	2.26 (1.25)
Upper back	4.60 (1.93)	1.85 (1.15)
Chest and breast	3.80 (2.11)	1.92 (1.15)
Waist and abdomen	3.71 (2.11)	2.61 (1.28)
Lower back	4.34 (2.01)	2.49 (1.28)
Rear and buttocks	4.10 (2.10)	2.21 (1.28)
Thighs	4.04 (2.13)	2.16 (1.22)
Calves	4.57 (2.04)	1.80 (1.10)
Overall mean	4.28 (1.69)	2.1 (0.92)

desire. The least satisfaction was the skin of the waist and abdomen, chest and breast, and upper arms. The most desired body sites for BCS were waist and abdomen skin, lower back, and upper arms.

The overall mean perceived body image satisfaction, overall mean perceived desire for cosmetic surgery, and percentage of lost weight of the baseline weight compared with different types of BS are displayed in Table 4. The analysis findings showed that the patients who had undergone gastric bypass had the lowest mean perceived satisfaction with their body's excess skin compared with those who received other types of BS. In contrast, patients who underwent intragastric balloons had the highest mean perceived satisfaction. In terms of lost weight of baseline weight sleeve bypass obtained the highest weight loss with a mean of 34.91 ± 15.31 kg.

The bivariate correlations between participants' perceptions and outcomes are shown in Table 5. Participants' mean perceived body image satisfaction correlated negatively with their mean perceived overall desire for BCS ($r = -0.468$, $P < 0.010$). Moreover, the patient's overall mean percentage of lost body weight post-BS correlated negatively and significantly with body skin satisfaction score ($r = -0.129$, $P < 0.010$). Patients' age correlated significantly but negatively with their overall mean perceived body image satisfaction with excess skin ($r = -0.157$, $P < 0.010$). For the patients who underwent BCS recently, the overall self-rating of satisfaction with their current

Table 4. Descriptive Analysis of the Overall Mean Perceived Body Image Satisfaction, Perceived Desire for Cosmetic Surgery, and Percentage of Lost Weight of Baseline Weight of BS Types

Type of BS	Overall Mean Perceived Body Image Satisfaction		Overall Mean Perceived Desire for BCS		Percentage of Lost Weight of Baseline Weight (kg)	
	Mean	SD	Mean	SD	Mean	SD
Gastric banding	4.08	1.42	2.57	1.13	27.64	17.82
Gastric bypass	3.11	1.46	2.58	0.78	34.91	15.31
Intragastric balloon	4.85	1.8	2.31	1.16	21.97	10.1
Sleeve gastrectomy	4.33	1.67	2.01	0.88	33.51	12.39

Table 5. Bivariate Correlations between the Patients' Measured Perceptions of Body Image, Desire for Surgery, and Other Relevant Factors and Outcomes

	Desire Cosmetic Surgery	Body Image Satisfaction	Lost Weight %	Previous Surgery Satisfaction	Expectation	Appearance Rating	Years Since Bariatric Surgery	BMI Score
Overall mean perceived desire for cosmetic surgery	1							
Overall mean perceived body image satisfaction	–0.468*							
Percentage of lost body weight from baseline weight	0.066	–0.129*						
Satisfaction level with previous cosmetic surgery outcome	–0.124	–0.041	–0.057					
Mean perceived expected improvement from body contouring surgery	0.185*	0.029	–0.060	–0.065				
Self-rating of overall appearance	–0.142*	0.376*	0.128*	–0.130*	0.061			
Time elapsed since the bariatric surgery	–0.050	–0.033	0.141*	0.231*	–0.016	–0.041		
Body mass index (BMI) score	0.003	–0.027	–0.424*	0.123	0.044	–0.337*	0.157*	
Age (y)	0.068	–0.157*	–0.120†	–0.013	–0.096	0.085	0.199*	0.081

*Correlation is significant at the 0.01 level (two-tailed).
†Correlation is significant at the 0.05 level (two-tailed).

Table 6. Multivariable Linear Regression Analysis of Bariatric Surgery Patients' Desire for Body Contouring Surgery (Any Body Parts; N = 410)

	Unstandardized Beta Coefficients	95.0% CI for Beta Coefficient		*P*
		Lower Bound	Upper Bound	
Constant	–1.289	–1.892	–0.686	<0.001
Sex = female	0.349	0.182	0.517	<0.001
Age (y)	0.002	–0.008	0.012	0.763
Marital state = ever married	0.151	–0.039	0.341	0.119
Nationality = Saudi	0.309	–0.004	0.623	0.053
Overall mean perceived satisfaction with body sites skin	–0.426	–0.508	–0.344	<0.001
Mean perceived expected improvement from body contouring surgery	0.191	0.127	0.256	<0.001
Mean percentage of lost weight from baseline weight	0.007	0.001	0.014	.031
History of obesity as an adolescent = yes	0.246	0.063	0.429	.009
Time elapsed since the bariatric surgery	–0.046	–0.077	–0.016	.003
Received bariatric surgical procedure: sleeve gastrostomy	–0.434	–0.653	–0.215	<0.001
History of previous body contouring surgery = positive	0.318	0.131	0.506	.001

Dependent outcome variable = overall desire for body contouring surgery of any body parts.
Model overall significance: f(10, 399) = 21.30, P < 0.001, Model R^2 = 0.348, adjusted R^2= 0.332.

appearance correlated negatively with their satisfaction with previous BCS outcomes (r = -0.130, $P < 0.050$).

The multivariable linear regression analysis was used to regress participants' mean perceived desire for BCS against sociodemographic characteristics, history of obesity, and surgical-related outcomes and perceptions. The yielded multivariable-adjusted findings, Table 6, showed that female BS patients perceived a significantly stronger desire for BCS. The patient's overall mean perceived satisfaction with body site excess skin correlated negatively and significantly with their desire for BCS of any body parts (β-coefficient = -0.426, $P < 0.001$). Greater satisfaction with body excess skin predicted significantly lower desire for BCS. Furthermore, the multivariable-adjusted findings showed that participants' mean perceived expectations of body improvements post-BCS converged significantly and positively on their desire for BCS (β-coefficient = 0.191, $P < 0.001$). The duration of time elapsed since their latest BS had correlated negatively and significantly with their desire for BCS (β-coefficient = -0.046, $P = 0.003$).

Table 7. Multivariable Binary Logistic Regression Analysis of Bariatric Surgery Patients' Odds of Having Previous Body Contouring Surgery (n = 410)

		95% CI for OR		
	Multivariate Adjusted OR	Lower	Upper	*P*
Age (y)	0.982	0.954	1.011	0.212
Sex = female	2.080	1.169	3.702	0.013
Educational level = university or higher	2.057	1.239	3.414	0.005
Smoker = Yes	2.262	1.268	4.036	0.006
Residence = northern provinces	0.200	0.057	0.702	0.012
Residence = central region	2.762	1.616	4.720	<0.001
Mean perceived overall desire for body contouring surgery	1.708	1.304	2.236	<0.001
Mean perceived expected improvement from body contouring surgery	0.847	0.684	1.049	0.128
History of overweight as a child	2.641	1.390	5.020	0.003
History of overweight as an adolescent	0.447	0.231	0.864	0.017
Current body mass index (BMI) score	0.987	0.938	1.038	0.609
Constant	0.145			0.073

Dependent outcome variable = previous history of body contouring surgery (No/Yes).

Table 8. Multivariable Linear Regression Analysis of Bariatric Surgery Patients' Mean Perceived Body Image Satisfaction Level Score (N = 410)

		95.0% CI for Beta Coefficient		
	Unstandardized Beta Coefficients	Lower Bound	Upper Bound	*P*
Constant	8.485	7.106	9.863	<0.001
Sex = female	0.035	–0.266	0.337	0.818
Age (y)	–0.033	–0.051	–0.015	<0.001
Marital state = ever married	0.237	–0.087	0.562	0.152
Residence = eastern provinces	0.505	0.125	0.885	0.009
Residence = northern provinces	–0.755	–1.201	–0.309	0.001
Residence = southern provinces	–0.843	–1.257	–0.428	<0.001
Educational level = university degree or higher education	–0.347	–.634	–0.061	0.018
Households' monthly income level ≥ 5000 SAR/month	0.261	.066	0.457	0.009
Received bariatric surgical type = gastric bypass	–0.813	–1.384	–0.243	0.005
Percentage of lost weight from baseline weight postbariatric surgery	–0.021	–0.033	–0.008	0.001
Time elapsed since the bariatric surgery	0.058	0.002	0.114	0.043
Overall mean perceived desire for cosmetic surgery/ body contouring surgery	–0.757	–0.920	–0.594	<0.001
Body mass index (BMI) score	–0.034	–0.064	–0.004	0.025

Dependent outcome variable = overall mean perceived body excess skin satisfaction score.
Model overall significance: $f(13, 696) = 16.33$, $P < 0.001$. Model $R^2 = 0.350$, adjusted $R^2 = 0.328$.

Moreover, participants who had sleeve gastrectomy perceived significantly lower desire for BCS score compared with participants who had other bariatric surgical types (β-coefficient = -0.434, $P < 0.001$). The patient's other measured predictor-independent variables did not correlate significantly with their desire for BCS; therefore, they were dismissed from the analysis model.

The multivariable binary logistic regression analysis was applied to recent BCS. The resulting analysis model findings, Table 7, showed that female patients were found to be significantly more likely (2.080 times more) to have recent BCS ($P = 0.013$). Moreover, the multivariate-adjusted findings showed that patients known to be obese/overweight during their childhood were found to be significantly more likely to have recent cosmetic surgery (2.641 times more) compared with patients not known to be obese as children ($P = 0.003$). However, participants known to be obese/overweight during adolescence were conversely found to be less inclined to recent BCS: 55.3% less compared with participants not known to have adolescent obesity ($P = 0.017$). Furthermore, smoker patients were found to be significantly more likely (2.262 times) more to have recent BCS compared with nonsmoker patients on average ($P = 0.006$); smoker patients have a greater mean probability of having BCS compared with nonsmokers.

The multivariable linear regression analysis of patients' overall mean perceived satisfaction score with their body's excess skin is displayed in Table 8, which shows that patients' age correlated significantly and negatively with their overall mean perceived body image satisfaction score with excess body skin (β-coefficient = -0.033, $P < 0.001$); older patients perceived significantly lower satisfaction with body excess skin on average. Additionally, patients who had undergone a gastric bypass had significantly lower mean perceived satisfaction with the body's excess skin than those who received other types of BS (β-coefficient = -.813, $P = 0.005$). The patient's mean percentage of lost body weight from presurgical weight correlated negatively with overall satisfaction with their body's excess skin; patients who lost more

weight perceived less excess body skin satisfaction on average (β-coefficient = -0.021, $P = 0.001$).

DISCUSSION

The present study assessed the desire for BCS following BS. To our knowledge, this is the first Saudi Arabian nationwide study to address this topic. Compared to the existing literature, our study is unique in its focus on thorough evaluation of various aspects of the postbariatric patients' experience with excess skin, in its considerably larger sample size, and in expanding our understanding of the Saudi postbariatric population.

The majority of patients who undergo BS experience excess skin on a variety of body parts, eg, arms, thighs, abdomen, breasts, and the inguinal region, as a consequence of losing significant amounts of weight,[5,8] leading to redundant skin-related issues and mobility interference, which can adversely affect psychosocial and physical functions and overall quality of life.[12–14] The beneficial role of BCS in post-BS is well-established in the medical literature, with documented improvement in various aspects of the patient's life, including physical symptoms,[15] psychological and social functions,[15,16] sexual well-being,[15] acceptance of body appearance,[17] and improvement in attractiveness and self-confidence.[18]

BS patients' mean perceived excess skin satisfaction was rated as 4.28 ± 1.69 out of 7 points, with skin surplus around the waist and abdomen, the chest and breast, and the upper arms associated with the least amount of satisfaction. This finding is consistent with existing literature.[10,19] The correlation between age and perceived satisfaction with excess body skin was particularly interesting; older participants reported significantly lower satisfaction levels. Older individuals may be more prone to developing excess skin due to the physiology of the skin, which decreases in elasticity and tone with age.[20,21]

A substantial number of post-BS patients desired BCS to manage skin redundancy, with a cumulative desire mean for all body areas of 2.10 of 4 points. Azin et al,[22] Staalesen et al,[23] and Monpellier et al[24] reported similar findings, with desire rates ranging from 62.4% to 95.4%. In this study, the desired body sites for BCS following BS have primarily focused on the abdomen and waist, lower back, upper arms, buttocks, and thighs; these findings are supported in prior studies.[2,8,10,22,25]

In line with previous findings, our results highlighted that female BS patients perceived a significantly stronger desire for BCS. In a society that promotes flawless, young appearances and societal beauty standards, women may be more concerned about their appearance, feeling pressured to achieve the ideal of beauty. Additionally, according to findings of a study that evaluated the changes following BS in perception and physical measurements of arm and thigh skin and degree of excess skin discomfort, female participants had experienced significantly more excess skin and higher discomfort in the arms than male participants.[26] Furthermore, Biörserud et al[27] and Staalesen et al[23,25] reported a similar finding concerning excess skin and discomfort on several body parts. In this study, the time elapsed since BS correlated negatively and significantly with the desire for BCS; this is in line with prior studies.[19,28]

Despite the increasing prevalence of BCS and its potential benefits, BCS does not constitute a standard part of the post-BS treatment regimen, and only a minority of patients undergo BCS.[24,29] The present study shows a relatively low prevalence of BCS in postbariatric patients, consistent with prior studies conducted in other cultural contexts, such as in the United States, Canada, United Kingdom, Netherlands, Switzerland, Sweden, Austria, and Italy.[8] A systematic review examining the prevalence of BCS in postbariatric patients revealed that among the 3653 postbariatric patients who participated, only 547 (18.5%) underwent at least one BCS.[8] Regarding the top four operated body contouring sites in the presented study, the abdomen/waist was the most frequently operated on (37%); the second most contoured areas were chest and breast (31%), followed by upper arms (30%), then the lower back (18%), a finding consistent with the previous studies by Al-Hadithy et al,[30] and Marek et al.[31] Moreover, the data further suggest that a recent body contouring procedure tended to increase the desire for a second procedure compared with patients who had not undergone a BCS in the past, which aligns with prior studies.[32–34]

In the present study, a quarter of the postbariatric patients fulfilled their desires and underwent a recent BCS. However, participants were not uniformly satisfied with the results of their previous BCS. This seems to resonate with the findings of Beek et al (2012) and Pecori et al (2007), who concluded that patient satisfaction with the outcome of BCS is often less favorable than the surgeon's judgment and suggests that patients' expectations are generally unrealistic.[34,35] Realistic goals are the most critical factor for ensuring patient satisfaction, especially concerning achieving a successful outcome.[21] An open discussion between the surgeon and the patient is essential to alleviate the inherent fear often associated with plastic surgery and provide a constructive alternative to unrealistic expectations.

In view of the evidence, our findings highlighted the importance of incorporating plastic and reconstructive surgery as an integral part of the multidisciplinary approach to obese patients following BS as an essential component of surgery-mediated weight loss recovery. With regard to our results, there is a need for national guidelines to guide clinical decision-making, provide clear directions on the referral pathway for post-BS BCS, and communicate adequately to the bariatrician. Additionally, these national guidelines should clarify the possible qualification for reimbursement of BCS because the Saudi insurance company does not reimburse such procedures in postbariatric patients. Furthermore, a standardized approach should be implemented toward excess skin assessment at the follow-up appointment in postbariatric patients, rather than relying solely on the body mass index calculation.

To conclude, we propose potential future research to narrow our current knowledge gap on the disparity between the number of patients who desire BCS and those who underwent BCS and explore the hesitancy and barriers to BCS among postbariatric patients.

CONCLUSIONS

In conclusion, excess skin following substantial weight loss is an issue for most post-BS patients. This population of patients has an increased desire for BCS, implying the significance of reconstructive surgery in the overall treatment approach for weight loss surgery in morbidly obese patients.

Limitations

The study faced several limitations. To begin, using nonprobability sampling may decrease the findings' generalizability. Furthermore, using an online questionnaire may impact the study sample's representativeness. However, according to the World Bank database, approximately 100% of the Saudi population has access to the internet, which indicates widespread access to most segments of the population.[36] The study faced a possible sampling bias, wherein only interested individuals filled out the questionnaire.

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DISCLOSURE

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

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