



Decision Regret up to 4 Years After Gastric Bypass and Gastric Banding

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Published online: 22 February 2019
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Abstract

Background Weight loss surgery (WLS) is neither risk-free nor universally effective. Few studies have examined what proportion of patients regret having undergone WLS.

Methods We interviewed patients at two WLS centers before and after WLS about weight loss, quality of life/QOL (Impact of Weight on QOL-lite), and decision regret (modified Brehaut Regret scale, range 0–100). We conducted separate multivariable logistic regression models to examine the association between weight loss and Δ QOL scores and having decision regret (score > 50).

Results Of 205 RYGB patients, only 2.2% (year 1) to 5.1% (year 4, $n = 134$) reported regret scores > 50 over 4 years; 2.0–4.5% did not think they made the right decision; 2.0–4.5% would not undergo WLS again. In contrast, of 188 gastric banding patients ($n = 123$ at year 4), 8.2–20.3% had regret scores > 50; 5.9–19.5% did not think they made the right decision; 7.1–19.5% would not undergo WLS again. Weight loss and Δ QOL scores were significant correlates of decision regret after banding although weight loss was a stronger correlate with lower model quasi-likelihood under the independence model criterion score. Four years after banding, mean weight loss for patients with regret scores > 50 was 7.4% vs. 21.1% for those with scores < 50; the AOR for regret score > 50 was 0.90 (95% CI 0.87–0.94) for every 1% greater weight loss. Poor sexual function, but not weight loss or other QOL factors, was significantly correlated with decision regret after RYGB.

Conclusion Few patients regret undergoing RYGB but 20% regret undergoing gastric banding with weight loss being a major driver.

Keywords Decision-making · Quality of life · Weight loss

Background

Bariatric or weight loss surgery (WLS) is the most effective weight loss treatment available [1–3]. Nevertheless, WLS is neither risk-free nor universally effective [4, 5]. WLS is

associated with short-term peri-operative complications and longer-term negative effects including gastrointestinal side effects, malnutrition, worsening depression, and higher risks of suicides, substance abuse, and accidental deaths and overdoses [6–11]. Weight loss outcomes also vary substantially, with weight regain occurring over time for many patients [1, 3, 12, 13]. Moreover, patients often have weight loss expectations that exceed what would be considered clinical success [14]. Finally, there is some evidence to suggest that certain quality of life considerations may have a larger impact on patients' overall well-being than others [15, 16]; thus, the effect of WLS on individual QOL domains may drive how patients view their decision to undergo WLS in retrospect. Few studies, however, have examined how patients feel about their decision to undergo WLS surgery in this context.

In this study, we examined patient's perceptions of their decision to undergo WLS among over 400 patients who underwent Roux-en-Y gastric bypass (RYGB) and gastric banding up to 4 years after undergoing WLS. We also explored the relative importance of weight loss and changes in quality of life after surgery as a correlate of whether patients expressed regret.

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Methods

Study Sample, Recruitment, and Data Collection

The Assessment of Bariatric Surgery (ABS) Study is a longitudinal cohort study of patients who were being evaluated for WLS. The aims of ABS were to understand patients' perception and decision-making around WLS and the value patients placed on the outcomes of WLS. Details of the study and some of its findings have been described previously [14, 16, 17]. Study subjects were systematically recruited from two academic WLS centers in Boston, one of which serves a large racial minority and socially disadvantaged urban population. Eligible patients were age 18 to 65 years at recruitment and spoke English and their physician gave permission for us to contact them.

Data were collected via a 1-h telephone interview at baseline and annually for up to 4 years and via medical record review. Overall study response rate was 70% at baseline. Interviews elicited information about patients' demographics, self-reported health, height and weight, and quality of life, and patients' perspectives on their weight, weight loss, and WLS. A trained study nurse abstracted from the medical record additional clinical information including comorbidities. The study was approved by institutional review boards (IRB) at the Beth Israel Deaconess Medical Center, Boston Medical Center, and University of Massachusetts Center for Survey Research (all in Boston, MA).

Our current study includes patients who underwent either RYGB or gastric banding and who reported follow-up data on at least one of the follow-up time points.

Measures

Decision Regret

To assess how patients felt about their decision to undergo WLS over time, we administered a modified version of the Decision Regret Scale developed by Brehaut et al. [18], which had been originally developed to explore decision-making around hormone replacement therapy. The original scale was previously validated and shown to correlate with satisfaction with health decisions, decisional conflict, and overall quality of life [18]. In our study, patients were asked to reflect on their decision to undergo WLS at each annual follow-up interview in answering five questions: (1) given their experience with WLS, whether they believed they made the right decision (definitely yes, probably yes, probably no, definitely no); (2) how much they regretted the choice they made (very much, somewhat, a little, or not at all); (3) if they had to do it over again, how likely they would make the same decision (very likely, somewhat likely, not very likely, or not at all likely), and (4) how much had their decision negatively affected them

(a lot, some, a little, or not at all); and (5) how wise they thought their decision had been (very wise, somewhat wise, not very wise, or not wise at all). Items 2 and 4 are reversed coded and for all items responses are converted to a 0–100 scale so that higher scores reflect greater regret with the decision they made; these scores were then summed and averaged so that an overall score greater than 50 reflects overall regret for their decision.

Demographic and Clinical Information

We asked about participants' demographic characteristics including age, sex, race/ethnicity, and education. In addition, we abstracted information about patient's chronic health conditions from medical records. Body mass index (BMI) was calculated at baseline and annual time points based on patient's self-reported weight and measured height abstracted from the clinical record. We used self-reported rather than measured weight because the timing of measured weights varied and may not have been consistent with their weight at the time of the interviews. Percent weight change at annual time points was calculated by taking the difference between the follow-up and baseline weight and dividing by the baseline weight multiplied by 100. WLS surgery type and baseline comorbid conditions were extracted from the medical record by a trained study nurse.

Health Status Quality of Life Measures

We assessed quality of life via the Impact of Weight on Quality of Life-lite (IWQOL-lite) [19, 20]. The IWQOL-lite is a 31-item instrument developed to capture five domains specific to obesity, namely physical function, self-esteem, sexual life, public distress or weight stigma, and work. Responses were scored on a 0–100 scale according to standard methods for each of the subscales and for their global scores; higher scores on these scales indicate better quality of life. Change in quality of life was determined by subtracting the follow-up score from the baseline score.

Data Analysis

We used descriptive statistics to characterize our sample overall and by WLS type. Our primary aim was to characterize decision regret over time and our secondary aim was to explore the association between weight loss and change in QOL scores after WLS and decision regret. We were particularly interested in examining the degree to which change or lack of change in certain QOL domains were more or less associated with the variation in decision regret relative to the strength of the association between weight loss and decision regret. To accomplish this, we conducted separate multivariable logistic models with repeated measures using the generalized estimating equation

with decision regret score > 50 as the dependent variable (binary outcome). The primary exposure or independent variable of percent weight loss, change in overall total QOL score, and change in individual QOL subscales scores were evaluated separately in respective models. All models adjusted for follow-up time point and accounted for clustering by patients. We tested for and noted a significant interaction between our primary exposures of interest and surgery type; thus, we stratified all multivariable analyses according surgery type. Because a relatively small proportion of patients reported decision regret (thus limiting the number of variables we could adjust for), we only adjusted for baseline factors associated with decision regret in unadjusted bivariable analyses (data not shown), namely age and WLS type, in these parsimonious models. Sex, race, education, baseline BMI, and baseline comorbid conditions were not associated with decision regret in unadjusted analyses and were therefore not included in our multivariable models. We also did not adjust for percent weight loss in our QOL models since percent weight loss is in the causal pathway and we would expect change in weight loss and change in QOL to be highly collinear. We then compared the model QIC (quasi-likelihood under the independence model criterion) of the different models to identify whether percent weight loss or change in QOL and the different QOL subscales were stronger correlates. The model QIC in GEE models is analogous to model AIC (Akaike Information Criterion) for likelihood-based models and is an estimator of the relative quality and parsimony of statistical models for a given set of data. Models with a lower QIC or AIC indicate that the model and its variables have greater explanatory power compared with a model with a higher QIC or AIC.

Results

Of the 526 patients who underwent RYGB or gastric banding, 403 (76.6%) had follow-up data on at least one of the follow-up time points. Table 1 presents the baseline characteristics of our included sample overall and by WLS type. The majority of patients were White and female and slightly less than half had a college degree.

Table 2 presents the patient's perspective on their decision to undergo WLS in retrospect stratified by surgery type across the 4 years of follow-up. Among patients who underwent RYGB, approximately a third of patients reported that the WLS caused some negative effects at each of the 4 years; however, only 4–8% across the 4 years scored more than 50 on the decision regret scale, indicating some level of overall regret with their decision. In contrast, up to two-thirds of patients reported some negative effects after gastric banding and up to 20% of patients who underwent gastric banding scored greater than 50 on the overall decision regret scale. Up to 19.5% reported that they “probably” or “definitely” did not

make the right decision and would be unlikely to “do it again,” almost 30% regretted their choice at least “a little,” and up to 8.9% felt that it was an unwise decision.

Table 3 presents the mean percent weight loss and change in QOL by decision regret score by WLS type. Table 4 presents adjusted associations between weight loss and decision regret (regret score > 50) and between change in total QOL score and respective subscale scores and decision regret in separate models by surgery type. Among RYGB patients, sex life was the only significant correlate of decision regret and had the lowest model QIC. In contrast, percent weight loss and total QOL and individual QOL subscale scores were all significant correlates of decision regret among patients who underwent gastric banding. Compared with the model that included percent weight loss (but not QOL), models that included QOL measures (but not weight loss) had higher model QIC scores suggesting that weight loss was a stronger correlate than improvement in QOL score of whether patient expressed regret. The OR was 0.93 (95% CI 0.90, 0.96) for every 1% increase in weight loss. In contrast for every 1-point improvement in the total IWQOL-lite score, the odds ratio was 0.97 (0.95, 0.98). Among the models containing different QOL domains, the model that included the physical function subscale—followed by the model that included the self-esteem subscale—had the lowest model QICs suggesting that degree of improvements in physical function and self-esteem were the most important QOL correlate of whether patients expressed decision regret over undergoing WLS.

Discussion

In our study of over 400 patients who underwent WLS, one in five patients who underwent gastric banding reported regret over their decision to undergo WLS whereas no more than 5% of patients who underwent RYGB expressed regret at any time point in the up to 4 years of follow-up. Both percent weight loss and level of improvement in QOL scores were significantly associated with whether patients expressed decision regret after gastric banding although percent weight loss was by far the strongest correlate. Among the domains of QOL, change in physical function was the most important correlate followed by improvement in self-esteem for gastric banding patients. In contrast, with the exception of sexual function, level of weight loss and changes in other aspects of QOL were not significantly associated with decision regret after RYGB.

Few data are available on how patients feel about their decision to undergo WLS in retrospect. Previous quantitative research has largely focused on clinical outcomes of WLS with limited data on patient-reported perspectives. Thus, insight on patients' perspectives post-WLS has been largely derived from qualitative studies, most of these with small sample sizes (less than 30 participants) from single centers

Table 1 Sample characteristics at baseline (*BMI* body mass index)

	Overall cohort <i>n</i> = 403	RYGB <i>n</i> = 215	Gastric band <i>n</i> = 188
Mean age, years (sd)	44.9 (11.7)	44.1 (10.9)	45.8 (12.4)
Mean BMI (sd)	46.5 (7.8)	47.3 (8.9)	45.5 (6.0)
Sex, <i>n</i> (%)			
Female	307 (76.2)	176 (81.9)	131 (69.7)
Male	96 (23.8)	39 (18.1)	57 (30.3)
Race/ethnicity, <i>n</i> (%)			
Non-Hispanic White	281 (69.7)	141 (65.6)	140 (74.5)
Non-Hispanic Black/African American	68 (16.9)	46 (21.4)	22 (11.7)
Hispanic	38 (9.4)	22 (10.2)	16 (8.5)
Other	16 (4.0)	6 (2.8)	10 (5.3)
Highest education, <i>n</i> (%)			
High school diploma, GED, or less	95 (23.6)	56 (26.2)	39 (20.7)
Some college	138 (34.3)	74 (34.6)	64 (34.0)
4-year college diploma or more	169 (42.0)	84 (39.3)	85 (45.2)
Comorbidities, <i>n</i> (%)			
Hypertension	227 (56.5)	128 (59.8)	99 (52.7)
Dyslipidemia	266 (66.2)	134 (62.6)	132 (70.2)
Depression	211 (52.4)	101 (47.0)	91 (48.4)
Liver disease	209 (51.9)	106 (49.3)	103 (54.8)
Obstructive sleep apnea	183 (45.4)	97 (45.1)	86 (45.7)
IWQOL, mean (sd)			
Total	54.82 (18.98)	52.40 (18.76)	57.55 (18.92)
Physical functioning	46.99 (22.42)	44.39 (22.00)	49.99 (22.59)
Public distrust	57.62 (25.04)	55.58 (25.01)	59.97 (24.93)
Self-esteem	50.09 (25.20)	48.57 (25.95)	51.83 (24.25)
Sex life	67.63 (29.33)	64.35 (29.07)	71.28 (29.26)
Work	67.06 (23.14)	65.01 (23.10)	69.40 (23.02)

[21]. A recent systematic review of qualitative studies of patient experiences with WLS suggested patients' ambivalence around the lived experience of WLS was one of the major themes because of both the positive and negative changes associated with WLS [21]. Findings from our study confirm some of this ambivalence. Although a large proportion of patients reported some degree of negative effects after WLS, a majority of patients did not express overall regret with the decision to undergo WLS. More recently, Turrentine and colleagues [22] surveyed 155 participants post-RYGB and found that patients reported a mean satisfaction score of 8.4 (10 being highly satisfied). Our findings are thus consistent with those of Turrentine's study suggesting high satisfaction with the RYGB procedure. Our study contributes to this body of work by quantifying patient's level of regret—a powerful measure of dissatisfaction—after both RYGB and gastric banding in a systematic way and in a relatively large sample of patients with long-term follow-up.

Our finding that up to 20% of gastric banding patients expressed regret for having undergone the procedure and

believed they made the wrong decision is sobering but consistent with secular trends showing a marked reduction in the performance of this procedure in recent years. Nevertheless, the majority of patients who underwent gastric banding still expressed a favorable outlook suggesting a potential role for some patients; whether these patients would be better served by undergoing other WLS procedures is not addressed by our study. Not surprisingly, level of weight loss post-WLS is a major correlate of decision regret for gastric banding. Previous data have demonstrated markedly lower weight loss outcomes achieved from gastric band relative to RYGB including data from this current cohort which we published previously [13]. This difference in weight loss likely explains differences in rates of decision regret between gastric banding and RYGB. The lack of association between weight loss and regret after RYGB may in part reflect consistently high levels of weight loss at least the first few years after RYGB. Our study did not systematically collect adverse outcomes or side effects of WLS beyond their effect on QOL measures and it may be that these

Table 2 Patient perspective on WLS decision over time (RYGB Roux-en-Y gastric bypass. Percentages may not add up to 100 due to rounding)

	Year 1 <i>n</i> = 205	Year 2 <i>n</i> = 181	Year 3 <i>n</i> = 156	Year 4 <i>n</i> = 134
RYGB				
Decision regret score				
Mean (SD)	8.8 (15.0)	7.9 (14.5)	10.8 (19.1)	9.9 (16.0)
Median (Q1, Q3)	0 (0, 15.0)	0 (0, 15.0)	0 (0, 15.0)	0 (0, 15.0)
Score > 50, <i>n</i> (%)	5 (2.4)	4 (2.2)	8 (5.1)	4 (3.0)
Definitely made the right decision				
Probably or definitely no, <i>n</i> (%)	4 (2.0)	4 (2.2)	7 (4.5)	5 (3.7)
Regret choice				
Somewhat/very much, <i>n</i> (%)	5 (2.4)	4 (2.2)	10 (6.4)	7 (5.2)
A little, <i>n</i> (%)	10 (4.9)	5 (2.8)	6 (3.8)	6 (4.5)
Would do it again				
Not very or not at all likely, <i>n</i> (%)	4 (2.0)	4 (2.2)	7 (4.5)	4 (3.0)
WLS decision caused negative effects				
Some or a lot, <i>n</i> (%)	26 (12.7)	19 (10.5)	28 (17.9)	17 (12.7)
A little, <i>n</i> (%)	45 (22.0)	41 (22.7)	27 (17.3)	29 (21.6)
Not at all, <i>n</i> (%)	134 (65.4)	121 (66.9)	101 (64.7)	88 (65.7)
How wise was decision				
Not very or not at all, <i>n</i> (%)	2 (1.00)	3 (1.7)	6 (3.8)	2 (1.5)
Gastric band				
Decision regret score				
Mean (SD)	12.8 (20.0)	20.3 (26.4)	23.1 (28.1)	23.8 (27.8)
Median (Q1, Q3)	0 (0, 15.0)	15.0 (0, 25.0)	15.0 (0, 42.5)	15.0 (0, 45.0)
Score > 50, <i>n</i> (%)	14 (8.2)	23 (14.7)	26 (17.8)	25 (20.3)
Definitely made the right decision				
Probably or definitely no, <i>n</i> (%)	10 (5.9)	21 (13.4)	23 (15.8)	24 (19.5)
Regret choice				
Somewhat/very much, <i>n</i> (%)	9 (5.3)	17 (10.8)	23 (15.8)	16 (13.0)
A little, <i>n</i> (%)	19 (11.2)	19 (12.1)	19 (13.0)	19 (15.4)
Would do it again				
Not very or not at all likely, <i>n</i> (%)	12 (7.1)	26 (16.6)	24 (16.4)	24 (19.5)
WLS decision caused negative effects				
Some or a lot, <i>n</i> (%)	21 (12.4)	35 (22.3)	32 (21.9)	25 (20.3)
A little, <i>n</i> (%)	38 (22.4)	42 (26.8)	45 (30.8)	41 (33.3)
Not at all, <i>n</i> (%)	110 (64.7)	80 (51.0)	69 (33.6)	57 (46.3)
How wise was decision				
Not very or not at all, <i>n</i> (%)	4 (2.4)	10 (6.4)	12 (8.2)	11 (8.9)

adverse effects play an important role in which RYGB patients express regret.

Our study found that among the different QOL domains that are affected by WLS, the level of improvement in physical function and improvement in self-esteem were the two strongest correlates of patient decision regret after gastric banding. These findings are consistent with cross-sectional results in an earlier study by our group demonstrating that physical function was the QOL domain most associated with the health utility or health value reported by Caucasian and African American men seeking WLS whereas self-esteem was the one of the leading domains reported by Caucasian and

Hispanic women seeking WLS [16]. In our prior work, QOL factors were a stronger correlate of health value than even having obesity-related comorbidities such as diabetes [23]. Taken together, these findings highlight the importance of focusing on specific QOL outcomes in gauging the effectiveness of weight loss interventions including WLS.

Limitations

Our study findings should be interpreted in the context of several limitations. While it is one of the largest

Table 3 Association between mean weight loss and improvement in overall and subscale score on the Impact of Weight on Quality of Life-lite (IWQOL) on decision regret score over time by surgery type*

	Bypass		Band	
	Regret Score >50	Regret Score ≤50	Regret Score >50	Regret Score ≤50
% Weight Loss				
Year 1	33.0 (18.6)	32.6 (8.7)	11.2 (6.8)	18.4 (7.5)
Year 2	37.8 (17.9)	33.6 (9.2)	8.9 (7.3)	20.8 (9.2)
Year 3	28.8 (12.1)	31.7 (10.0)	7.1 (8.7)	20.7 (10.1)
Year 4	30.4 (13.2)	30.8 (10.7)	7.4 (8.2)	21.1 (11.6)
ΔBMI				
Year 1	15.3 (8.9)	15.8 (5.1)	4.6 (2.9)	8.7 (3.8)
Year 2	16.3 (8.9)	16.4 (5.6)	4.7 (3.9)	9.5 (4.7)
Year 3	13.0 (6.3)	15.7 (6.0)	4.1 (5.1)	9.6 (4.9)
Year 4	13.4 (5.2)	15.2 (6.0)	4.5 (4.8)	9.7 (6.0)
% Excess Weight Loss**				
Year 1	78.4 (45.7)	74.0 (24.0)	27.9 (18.8)	42.7 (19.2)
Year 2	84.9 (39.7)	75.3 (24.3)	21.2 (18.7)	48.9 (23.1)
Year 3	71.2 (24.4)	70.4 (26.4)	15.0 (19.4)	48.3 (24.6)
Year 4	72.6 (36.4)	68.4 (26.6)	16.1 (20.7)	50.1 (27.6)
ΔIWQOL, Total				
Year 1	38.4 (25.7)	37.4 (17.4)	18.21 (13.1)	21.4 (14.9)
Year 2	41.1 (11.2)	37.3 (18.2)	19.8 (24.5)	24.7 (16.1)
Year 3	20.8 (19.4)	36.4 (20.4)	15.7 (14.0)	24.5 (16.5)
Year 4	34.8 (10.1)	35.0 (18.9)	13.1 (15.9)	24.9 (16.4)
ΔIWQOL, Physical Function subscale				
Year 1	53.6 (30.4)	47.5 (21.4)	24.0 (12.7)	28.9 (18.8)
Year 2	56.8 (12.4)	46.3 (22.2)	17.3 (25.7)	33.7 (19.9)
Year 3	34.9 (17.9)	46.0 (22.2)	15.6 (15.0)	33.7 (21.4)
Year 4	47.7 (25.8)	44.5 (21.0)	17.2 (20.2)	31.5 (21.4)
ΔIWQOL, Public Distrust subscale				
Year 1	47.0 (27.1)	36.1 (24.0)	15.0 (22.5)	18.6 (20.0)
Year 2	38.8 (10.3)	36.7 (25.0)	20.2 (26.0)	22.6 (20.3)
Year 3	25.6 (20.4)	36.5 (25.6)	15.0 (19.8)	21.5 (21.9)
Year 4	36.3 (11.1)	35.2 (25.3)	12.2 (21.3)	24.3 (21.6)
ΔIWQOL, Self-Esteem subscale				
Year 1	45.7 (29.8)	34.7 (25.4)	15.3 (20.4)	20.0 (20.3)
Year 2	42.9 (27.0)	34.2 (26.7)	17.7 (26.6)	22.5 (21.6)
Year 3	17.0 (48.4)	34.0 (27.5)	9.5 (21.9)	22.6 (21.9)
Year 4	28.6 (17.7)	33.6 (27.5)	11.1 (15.6)	25.0 (20.6)
ΔIWQOL, Sex Life subscale				
Year 1	54.2 (34.4)	24.8 (28.0)	9.9 (26.4)	12.6 (19.7)
Year 2	29.2 (26.0)	25.6 (26.1)	19.9 (36.0)	13.3 (22.2)
Year 3	12.5 (35.5)	25.9 (27.5)	19.3 (27.5)	13.5 (23.9)
Year 4	15.6 (18.8)	22.7 (26.5)	4.9 (23.0)	13.8 (23.5)
ΔIWQOL, Work Life subscale				
Year 1	35.0 (29.5)	27.3 (19.8)	9.1 (16.3)	14.7 (18.7)
Year 2	17.2 (12.9)	27.0 (21.0)	23.4 (29.0)	18.1 (20.2)
Year 3	19.3 (19.1)	25.7 (23.4)	17.9 (17.3)	16.9 (17.4)
Year 4	27.6 (20.7)	26.1 (21.9)	8.9 (20.9)	18.0 (18.8)

* Results represent mean changes and standard deviations; results in bold indicate $p < 0.05$ for comparisons between those reporting a score >50 and those with a score ≤50; results

** calculated as $[(\text{Initial Weight} - \text{Postop Weight}) / (\text{Initial Weight} - \text{Ideal Weight})] \times 100$, where “ideal weight” is BMI of 25 kg/m². Appendix from <https://asmbs.org/resources/standardized-outcomes-reporting-in-metabolic-and-bariatric-surgery> was used

Table 4 Adjusted association between percent weight loss, change in overall, and subscale scores on the Impact of Weight on Quality of Life-lite (IWQOL) and decision regret over time by surgery type

Models*	Model QIC**	Adjusted OR (95% CI)
RYGB		
Percent weight loss	162.7	1.00 (0.91, 1.10)
Δ IWQOL, total score	157.8	0.97 (0.94, 1.00)
Δ IWQOL, physical functioning subscale	158.0	0.97 (0.95, 1.00)
Δ IWQOL, public distrust subscale	157.4	0.99 (0.97, 1.02)
Δ IWQOL, self-esteem subscale	159.1	0.98 (0.95, 1.05)
Δ IWQOL, sex life subscale	155.5	<i>0.98 (0.96, 1.00)</i>
Δ IWQOL, work life subscale	157.2	0.98 (0.96, 1.01)
Gastric banding		
Percent weight loss	375.7	<i>0.90 (0.87, 0.94)</i>
Δ IWQOL, total score	434.5	<i>0.97 (0.95, 0.98)</i>
Δ IWQOL, physical functioning subscale	435.0	<i>0.97 (0.96, 0.99)</i>
Δ IWQOL, public distrust subscale	454.4	<i>0.99 (0.97, 1.00)</i>
Δ IWQOL, self-esteem subscale	440.0	<i>0.98 (0.96, 0.99)</i>
Δ IWQOL, sex life subscale	449.3	<i>0.98 (0.97, 1.00)</i>
Δ IWQOL, work life subscale	453.0	<i>0.98 (0.97, 1.00)</i>

*Models are mutually exclusive and contain either percent weight or the indicated change in overall or subscale scores on IWQOL; all models are adjusted for age at surgery, WLS surgery type, and follow-up year and account for clustering by patient via the generalized estimating equation; italicized results are statistically significant at a p value < 0.05

**Lower model QIC indicates a higher quality model relative to a model with a higher QIC such that factors in models with lower model QIC are more strongly correlated with decision regret than factors in models with higher QIC

studies to date on patient perception of outcomes after WLS, patients were recruited from only two WLS centers in Boston. Thus, the generalizability of our findings is unclear although our results are consistent with smaller studies to date. There was also attrition over time such that only 65% of our respondents in year 1 ultimately responded to the year 4 follow-up. In addition, our sample size limited our ability to examine other correlates of decision regret and limited our ability to adjust for other factors that might confound our results. Given the number of models and correlates examined, our findings should be considered preliminary and hypothesis generating. Finally, we used a decision regret scale that was initially developed and validated on decisions related to hormone replacement therapy.

Conclusion

In summary, our study of over 400 patients who underwent either RYGB or gastric banding showed that one-fifth of gastric banding patients compared with no more than 5% of RYGB expressed overall regret about their decision to undergo WLS. Degree of weight loss was significantly correlated with whether patients reported decision regret after gastric banding but not after

RYGB. Among the QOL domains measured, degree of improvement in physical function and self-esteem appear to be the strongest correlates of whether patient reported regret with their decision to undergo gastric banding.

Funding Information This study was funded by R01 DK073302; one of the authors (CW) also received support from a NIH midcareer mentorship award (NIH K24 DK087932).

Compliance with Ethical Standards

The study was approved by institutional review boards (IRB) at the Beth Israel Deaconess Medical Center, Boston Medical Center, and University of Massachusetts Center for Survey Research (all in Boston, MA).

Conflict of Interest One of the authors reports ownership interest in Allurion (DJ). Another author (CA) also reports receiving consulting fees for being on the advisory boards of Nutrisystem, Zafgen, Sanofi-Aventis, Orexigen, EnteroMedics, GI Dynamics, Scientific Intake, Gelesis, Novo Nordisk, SetPoint Health, Xeno Biosciences, Rhythm Pharm, Eisai, and Takeda, and research funding from Aspire Bariatrics, GI Dynamics, Orexigen, Takeda and the Vela Foundation, Gelesis, Energesis, and Coherence Lab; this author also participated in the Takeda Speakers Bureau for the medication Contrave and owned stock in Science-Smart LLC.

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