

# Expectations for Weight Loss and Willingness to Accept Risk Among Patients Seeking Weight Loss Surgery

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**Importance:** Weight loss surgery (WLS) has been shown to produce long-term weight loss but is not risk free or universally effective. The weight loss expectations and willingness to undergo perioperative risk among patients seeking WLS remain unknown.

**Objectives:** To examine the expectations and motivations of WLS patients and the mortality risks they are willing to undertake and to explore the demographic characteristics, clinical factors, and patient perceptions associated with high weight loss expectations and willingness to assume high surgical risk.

**Design:** We interviewed patients seeking WLS and conducted multivariable analyses to examine the characteristics associated with high weight loss expectations and the acceptance of mortality risks of 10% or higher.

**Setting:** Two WLS centers in Boston.

**Participants:** Six hundred fifty-four patients.

**Main Outcome Measures:** Disappointment with a sustained weight loss of 20% and willingness to accept a mortality risk of 10% or higher with WLS.

**Results:** On average, patients expected to lose as much as 38% of their weight after WLS and expressed disappointment if they did not lose at least 26%. Most patients (84.8%) accepted some risk of dying to undergo WLS, but only 57.5% were willing to undergo a hypothetical treatment that produced a 20% weight loss. The mean acceptable mortality risk to undergo WLS was 6.7%, but the median risk was only 0.1%; 19.5% of all patients were willing to accept a risk of at least 10%. Women were more likely than men to be disappointed with a 20% weight loss but were less likely to accept high mortality risk. After initial adjustment, white patients appeared more likely than African American patients to have high weight loss expectations and to be willing to accept high risk. Patients with lower quality-of-life scores and those who perceived needing to lose more than 10% and 20% of weight to achieve “any” health benefits were more likely to have unrealistic weight loss expectations. Low quality-of-life scores were also associated with willingness to accept high risk.

**Conclusions and Relevance:** Most patients seeking WLS have high weight loss expectations and believe they need to lose substantial weight to derive any health benefits. Educational efforts may be necessary to align expectations with clinical reality.

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**B**ARIATRIC OR WEIGHT LOSS surgery (WLS) is one of few obesity modalities shown to produce long-term weight loss.<sup>1-5</sup> Given obesity's profound adverse health and quality-of-life consequences, as many as 150 000 Americans undergo WLS each year.<sup>6</sup>

Despite its rising popularity, WLS is not risk free or universally effective. Data suggest mortality risks range from less than 1% to as high as 5% in some high-risk groups.<sup>1,7,8</sup> Risk of serious complications and the need for revisional surgery can be as high as 20%.<sup>1,2</sup> High-quality long-term data on diverse populations in the United States are lacking, but data from the Swed-

ish Obese Subjects Study suggest that, although initial weight loss can be impressive within the first or second postoperative year, recidivism occurs in a large subset of patients.<sup>3</sup> Nevertheless, WLS leads to improvement in comorbidities, especially diabetes mellitus,<sup>9,10</sup> even after accounting for weight regain.<sup>3,11</sup> In the Swedish Obese Subjects Study, the mean sustained weight loss at 10 years was 25% to 26% of initial weight for subjects undergoing gastric bypass and 14% to 18% for those undergoing gastric banding; however, about one-quarter of patients undergoing gastric bypass and three-fourths of those undergoing gastric banding sustained less than 20% weight loss. Moreover, 9% of the gas-

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tric bypass patients and 25% of the gastric banding patients sustained less than a 5% weight loss at 10 years. A systematic review in 2006 estimated that patients lost 52% to 59% of their excess weight at 8 to 10 years,<sup>7</sup> although the review did not account for the attrition rate of the included studies, which would tend to bias results toward overestimating weight loss. One recent study from Switzerland with a follow-up rate of 90% reported a mean weight loss of 58% of excess weight, with slightly more than one-third of patients sustaining less than 50% of their excess weight loss (EWL).<sup>11</sup>

The high cost associated with WLS, its limited long-term outcomes data, and its potential risks for mortality and morbidity have led to ambivalence among some clinicians about routinely recommending this treatment to eligible patients.<sup>12</sup> However, we know little about how much patients value weight loss and how willing patients may be to accept serious risk to achieve substantial weight loss. Although clinicians and health payers traditionally focus on medical and economic effects, patients seek surgery for a variety of reasons.<sup>13,14</sup> Obesity's profound physical and psychosocial consequences,<sup>15</sup> for example, may lead some patients to value weight loss to such a degree that they may be willing to undergo a high risk to achieve substantial weight loss. Although few data are available about patients' perceptions and expectations of WLS, studies suggest that populations seeking weight loss treatments in general often desire a magnitude of weight loss<sup>16-18</sup> that exceeds even the amount that can be sustained consistently by most patients who undergo WLS. High weight loss expectations may cause patients to accept higher than reasonable surgical risks and affect the value they place on levels of weight loss that would lead to important improvements in comorbidities and reductions in health risk. A better understanding of the preferences and expectations of patients may help clinicians better educate and select patients who are most appropriate for WLS.

In this context, we studied more than 650 patients seeking WLS and examined their expectations and motivations and the mortality risks they were willing to undertake to undergo these procedures. We also explored the demographic characteristics, clinical factors, and patient perceptions associated with high weight loss expectations and patients' willingness to assume high surgical risk.

## METHODS

### STUDY SAMPLE, RECRUITMENT, AND DATA COLLECTION

The Assessment of Bariatric Surgery Study (ABS Study) is a longitudinal cohort study of patients undergoing evaluation for WLS. The goals of the ABS Study are to understand patients' perception and decision making about WLS and the longitudinal effect of WLS on quality of life and other health outcomes. Study subjects were recruited systematically from the WLS centers of 2 academic medical centers in Boston, one of which serves a large racial minority and socially disadvantaged urban population. To be eligible, patients had to be 18 to 65 years of age at the time of recruitment, speak English,

and have the permission of their physician for us to contact the patient.

Our study was approved by the institutional review boards at the Beth Israel Deaconess Medical Center, Boston Medical Center, and Center for Survey Research at the University of Massachusetts. Recruitment and consent differed slightly because institutional review board consent policies differed at the recruitment sites. All potentially eligible subjects were identified consecutively via appointment logs. Of 615 eligible patients (identified from April 3, 2008, through June 21, 2010) at the first site, 432 enrolled and provided verbal informed consent via telephone (70.2% response rate). At the second site, we were required by the institutional review board to obtain in-person written informed consent. Of 421 potentially eligible patients (identified from July 1, 2008, through March 3, 2010), 104 underwent surgery before we could approach them in person and 222 enrolled (70.0% response rate). We found no statistically significant differences between participants and eligible nonparticipants by sex or race; however, nonparticipants were slightly younger (mean age, 42 vs 44 years;  $P = .006$ ).

Data were collected during a 1-hour telephone interview at baseline that collected information on patients' demographic characteristics, self-reported height and weight, quality of life, and perspectives on their weight, weight loss, and WLS. Interviewers received a minimum of 3.5 days of training in standardized interviewing techniques, which included reading questions exactly as written and nondirective probing. Interviewers were not permitted to provide their own interpretations of questions, to offer definitions for words in the questions, or to record an answer that was not provided explicitly by the respondent. Interviews are scripted and questions are written with the goal of minimizing extraneous interviewer-respondent interactions that might lead to interviewer effects. Samples of all interviewers' work were monitored in real time by a monitor to ensure adherence to study protocol. A trained study nurse conducted medical record reviews to abstract additional clinical information, including comorbidities.

## MEASURES

### Perceptions of Weight and Preferences and Motivation for Weight Loss and WLS

Body mass index (BMI) was calculated using the patients' self-reported weight in kilograms divided by their measured height in meters squared as abstracted from the clinical record.<sup>19</sup> We used self-reported rather than measured weight because measured weights were collected at various time points when patients were trying actively to lose weight, and hence measured weight may not reflect the actual or perceived weight of patients at the time of interview. We asked patients about their weight and their perception of the health risks posed by their obesity (1 indicates not at all; 5, extremely high). We also asked patients for the minimal amount of weight they would have to lose to derive any health benefit. We then asked about patients' motivation for weight loss and about their ideal weight (ie, "If you could be any weight, how much would you like to weigh?").

We also asked patients a series of questions about WLS to try to understand their decision to seek the procedure. We first asked about their motivation and to rate how important a series of potential reasons were (very, somewhat, or a little important vs not important at all). We asked for the sources of their information about WLS and which was the most important. To measure patients' expectations for WLS, we then asked for the highest amount of weight that they might lose after WLS in the long term and for the lowest and the ideal amounts of

weight they hoped to lose and not gain back. We also specifically asked them to articulate the least amount of weight they would have to lose and not gain back to not feel disappointed. We then asked patients whether they would undergo WLS if some chance of dying from the WLS existed. Through an iterative process, we elicited the highest risk they were willing to accept and still undergo WLS.

### Quality of Life and Value of Weight Loss

We assessed quality of life and patients' value of different levels of weight loss by measuring their health utility, the criterion standard approach to assessing patients' quality of life and preferences of different health states.<sup>20</sup> To do so, we used an adapted version of the standard gamble method (validated approach to utility measure). In the standard gamble, respondents are typically asked to consider the following hypothetical choice: the certainty of continuing in their current state of health or taking a gamble. The gamble has 2 possible outcomes: a positive outcome that is typically perfect health and a negative outcome being death. Participants were then asked how willing they are to risk dying to achieve perfect health, with the idea being the higher the risk they are willing to take to achieve the better outcome, the less value they put on their current health. Because we were particularly interested in the value that patients placed on varying degrees of lower weight in addition to perfect health, we adapted the standard gamble by administering a series of additional scenarios. We asked patients to envision a treatment that would produce a permanent weight loss of a specified amount that required no effort on their part and would produce no adverse effects. We then specified that the treatment was associated with a small risk of death, and, through an iterative process, we asked patients to estimate the highest risk of dying they were willing to accept to achieve that particular weight loss outcome. The specified weight loss expressed included 10% and 20% weight loss, their highest healthy weight (or the weight loss associated with a BMI of 25), and their perceived ideal weight. In addition, we asked how much patients were willing to risk to achieve perfect health. In considering these scenarios, we asked patients to assume that no other weight loss treatments (including WLS) were available now or in the future.

Using participants' responses to the standard gamble scenarios, we calculated patients' utility values for their current state and all the health states set forth in the different scenarios, making no preconceived assumptions about what their most valued health state should be. The health and/or weight state (eg, ideal weight, perfect health) of highest value to the patient (ie, the outcome for which the patient was willing to accept the highest risk of dying) served as the reference state with an assigned utility value of 1. For example, if a patient responds that he or she is willing to accept the highest risk of dying to achieve their ideal weight and that risk is 10%, then the patient is calculated to have a current health utility of 0.90.

In addition, we assessed quality of life via the Impact of Weight on Quality of Life-Lite questionnaire,<sup>21</sup> a 31-item instrument developed to capture 5 domains specific to obesity,<sup>21</sup> namely, physical function, self-esteem, sexual life, public distress, and work. Responses were scored on a scale of 0 to 100 according to standard methods in each of the subscales and in their global scores, and higher scores on both scales indicate better quality of life.

### Clinical and Demographic Factors

Finally, we asked about participants' demographic and health behavioral characteristics, including age, sex, race/ethnicity, edu-

cational level, income, marital status, smoking, and alcohol intake. In addition, we abstracted information about the patients' chronic health conditions from the medical records.

## STATISTICAL ANALYSIS

We characterized our sample in terms of baseline demographic and clinical characteristics and their perceptions and expectations of and motivations for undergoing WLS. In bivariable analyses, we compared patient preferences for weight loss and their willingness to accept mortality risk using the Pearson  $\chi^2$  test for categorical variables and 2-tailed *t* tests for continuous variables. Our 2 primary outcomes were disappointment with a sustained weight loss of 20% and willingness to accept a mortality risk of 10% or higher to undergo WLS. We used multivariable logistic regression analyses to examine the relationship between various patient factors and these 2 outcomes. We used the 20% weight loss threshold based on evidence that a substantial minority of patients who have WLS do not sustain this level of weight loss in the long term.<sup>3</sup> In sensitivity analyses, we used a threshold of 50% EWL based on the Reinhold Classification and other long-term studies.<sup>4,5,11</sup> Mean mortality risks for WLS range widely, but even in high-risk populations the risk is generally less than 5%.<sup>2,7,8</sup> We considered patients who were willing to accept risks of 10% or higher as willing to accept unreasonably high risk. In sensitivity analyses, we lowered the risk threshold to 5% or higher; our multivariable results were similar and are not presented.

We were particularly interested in how these outcomes varied by sex and race. In our initial multivariable models, we included sex and race adjusted for age, BMI, educational level, income, and recruitment site. In subsequent models, we explored the independent contribution of factors such as self-reported health status, comorbidities (including heart disease, diabetes mellitus, obstructive sleep apnea, hypertension, reflux disease, chronic back pain, depression, and other psychiatric conditions), quality-of-life scores, perception of the health risk posed by weight, the minimal level of weight patients believed they needed to lose to derive any health benefit, the patient's primary source of information, and the importance of different factors in motivating patients to lose weight. Our final model included the variables in our initial model and any subsequent factor that was statistically significantly associated with the outcome at a *P* value of .05 or confounded the association between sex or race and the outcome.

## RESULTS

At the time of the analyses, 45.0% underwent Roux-en-Y gastric bypass; 36.2%, gastric banding; and 0.8%, sleeve gastrectomy. The remaining 18.0% had not proceeded with WLS. **Table 1** presents the baseline data of the 654 participants in our study. Most patients believed that their weight placed them at a high or an extremely high health risk. Patients cited a variety of personal reasons as very important in motivating their decision to seek WLS. They also cited several sources of information about WLS, with the most important source being their primary care physician, followed by family and friends.

Patients reported high expectations for WLS (**Table 2**) and disappointment if they did not lose and permanently sustain a mean loss of 26% of their weight or 59% of their excess weight as a result of WLS. Women had higher expectations for weight loss than men. Expectations also varied by race.



When asked about their willingness to assume some risk of death to lose different levels of weight or to achieve perfect health, slightly more than half were willing to accept any risk of dying to lose 20% of their weight or to achieve perfect health (**Table 3**). Slightly more than three-quarters of the patients were willing to do so to achieve their perceived ideal or most desired weight, whereas slightly less than 85% were willing to risk dying to undergo WLS. The acceptable risk of death was highly skewed, resulting in mean and median risks that were substantially discordant. Although most patients were willing to accept some risk of dying to undergo WLS, the absolute risk patients were willing to accept was quite small and in many cases negligible. For example, of the 550 patients who were willing to risk dying to undergo WLS, 75 of this subset (13.6%) could not articulate a minimal risk they were willing to accept and explicitly rejected a risk of 1 in 2000 (0.05%).

From patients' responses to these standard gamble scenarios, their health utility value for their current state was 0.87 overall (Table 3), reflecting the group's willingness to accept a 13% risk of dying to achieve their most desired health state, including perfect health or lower weight.<sup>22</sup> However, health utility values were highly skewed such that the median utility was 0.98; 48.5% were willing to take no more than a 1% risk of dying, whereas 42.0% were willing to accept a 5% or higher risk and 33.1% were willing to accept a 10% higher risk. Utility values for different health states were commensurate with patients' willingness to risk death to achieve the respective conditions, with ideal weight being the most valued health state and having the highest utility value. Perfect health was valued less than the patient's perceived ideal weight and less than a BMI of 25 but more than a 20% weight loss.

Of study patients, 74.1% reported that their disappointing weight loss would be equivalent to a 20% or greater weight loss; 67.3%, at least 50% of their excess weight. **Figure 1** shows the proportion of patients whose disappointing weight loss exceeded 20% of their baseline weight across different patient characteristics before adjustment. After adjustment for age, BMI, study site, educational level, and income, African American patients were less likely than white patients to be disappointed with a 20% weight loss, although this was not the case before adjustment, whereas women were more likely than men to be disappointed (**Table 4**). Low quality-of-life scores on the Impact of Weight on Quality of Life–Lite questionnaire were also significantly associated with patients' reporting disappointment with a 20% weight loss (Table 4, model 2) and explained in part some of the observed differences across race because African American patients were generally more likely to have higher quality-of-life scores than white patients. Patients who perceived a need to lose at least 10% or 20% of their body weight reported being more likely to be disappointed with a 20% weight loss than those who believed that a 5% to 10% weight loss would be beneficial. Perception of weight as a health risk, self-reported health status, comorbid conditions, primary source of WLS information, and different motivating factors were not significantly associated with reporting a disappointing weight loss that was above 20% of initial weight. Our results were

**Table 1. Sample Characteristics**

Characteristic <sup>a</sup>	Overall Sample (n = 654)
Age, mean, y	44.1
Weight, mean, kg (mean BMI)	131.1 (46.5)
Mean weight loss needed to achieve BMI of 25, kg (weight loss, %)	60.8 (45)
Race/ethnicity <sup>b,c</sup>	
White	66.2
African American	17.6
Hispanic	11.6
Other	4.4
Female sex	75.1
Educational level	
High school diploma, GED, or less	27.0
4-y College diploma or more	36.0
Income, \$	
≤20 000	19.7
20 001-40 000	16.0
40 001-80 000	28.2
≥80 000	36.1
IWQOL-L (range, 0-100), mean score	
Overall summary	53.5
Physical function	46.1
Self-esteem	48.2
Sexual life	65.2
Public distress	57.4
Work	65.3
Perception of weight as health risk	
None or slight	1.4
Moderate	8.7
High	47.8
Extremely high	42.1
Perceived minimal weight loss needed to gain any health benefit, % of body weight <sup>c</sup>	
0-5.00	11.4
5.01-10.00	18.7
10.01-20.00	35.9
20.01-30.00	21.3
≥30.01	12.8
Motivation to undergo WLS/lose weight rated very important	
Health/medical concerns	91.3
Psychosocial concerns	22.8
Appearance/embarrassment concerns	67.7
Physical limitation/fitness concerns	74.3
Sex life	29.0
Most important information source contributing to WLS decision <sup>c</sup>	
Media (television, newspaper, magazines, Internet)	7.0
Friends	11.5
Family	17.7
PCP	24.8
Physician other than PCP	9.0
Other nonphysician health care provider	1.9
Anything else	28.3

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); GED, General Educational Development; IWQOL-L, Impact of Weight on Quality of Life–Lite; PCP, primary care physician; WLS, weight loss surgery.

<sup>a</sup>Unless otherwise indicated, data are expressed as percentage of patients. Percentages have been rounded and might not total 100.

<sup>b</sup>One patient did not provide data on race.

<sup>c</sup>Percentages have been rounded and might not total 100.

similar when 50% EWL was the outcome in sensitivity analyses (data not shown).

**Table 2. Patient Expectations for Long-term Weight Loss After Weight Loss Surgery**

	Mean Initial Weight, kg	Weight Loss, % <sup>a</sup>			
		To Achieve Ideal/Dream	Maximum Anticipated	Minimal Anticipated	Disappointing
Overall (n = 654)	131.1	41 (92)	38 (87)	24 (54)	26 (59)
Sex					
Men (n = 163)	153.3 <sup>b</sup>	38 (81) <sup>b</sup>	37 (79) <sup>b</sup>	23 (49) <sup>b</sup>	24 (52) <sup>b</sup>
Women (n = 491)	123.8 <sup>b</sup>	42 (96) <sup>b</sup>	39 (89) <sup>b</sup>	24 (56) <sup>b</sup>	27 (61) <sup>b</sup>
Race <sup>c</sup>					
White (n = 433)	130.6	41 (92)	38 (86)	23 (53)	25 (58)
African American (n = 115)	134.7	43 (92) <sup>d</sup>	41 (89) <sup>e</sup>	26 (57) <sup>e</sup>	28 (61) <sup>e</sup>
Hispanic (n = 76)	128.8	40 (90)	40 (90) <sup>d</sup>	26 (59) <sup>e</sup>	27 (61) <sup>d</sup>
Other (n = 29)	132.9	39 (89)	37 (85)	25 (57)	26 (59) <sup>e</sup>

<sup>a</sup>Initial percentages refer to the percentage of weight loss as a function of initial weight. Percentages in parentheses refer to the percentage of weight loss as a function of patients' excess weight (weight as body mass index [calculated as weight in kilograms divided by height in meters squared] >25).

<sup>b</sup>*P* < .05 comparing men vs women.

<sup>c</sup>One patient did not provide data on race.

<sup>d</sup>*P* < .10 comparing African American or Hispanic patients with white patients.

<sup>e</sup>*P* < .05 comparing African American or Hispanic patients with white patients.

**Table 3. Patient Preferences for Health and Weight Loss and Willingness to Accept Mortality Risk**

	Willing to Risk Death, %	Acceptable Risk	Mean (Median)	Utility Value <sup>a</sup>
			Acceptable Among Those Willing to Assume Risk	
Current weight	NA	NA	NA	0.87 (0.98)
Health/weight outcome				
10% Weight loss	32.2	3.7 (0.1)	6.9 (0.1)	0.90 (0.99)
20% Weight loss	57.5	6.2 (0.1)	8.7 (1.0)	0.92 (0.99)
BMI of 25	74.6	10.5 (1.0)	12.2 (2.0)	0.96 (1.00)
Perceived ideal weight	75.7	10.7 (1.0)	12.4 (2.0)	0.97 (1.00)
Perfect health	53.4	7.8 (0.1)	10.2 (1.0)	0.94 (1.00)
To undergo WLS	84.8	6.7 (0.1)	12.1 (5.0)	NA

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); NA, not applicable; WLS, weight loss surgery.

<sup>a</sup>Calculated on a scale of 0 to 1.

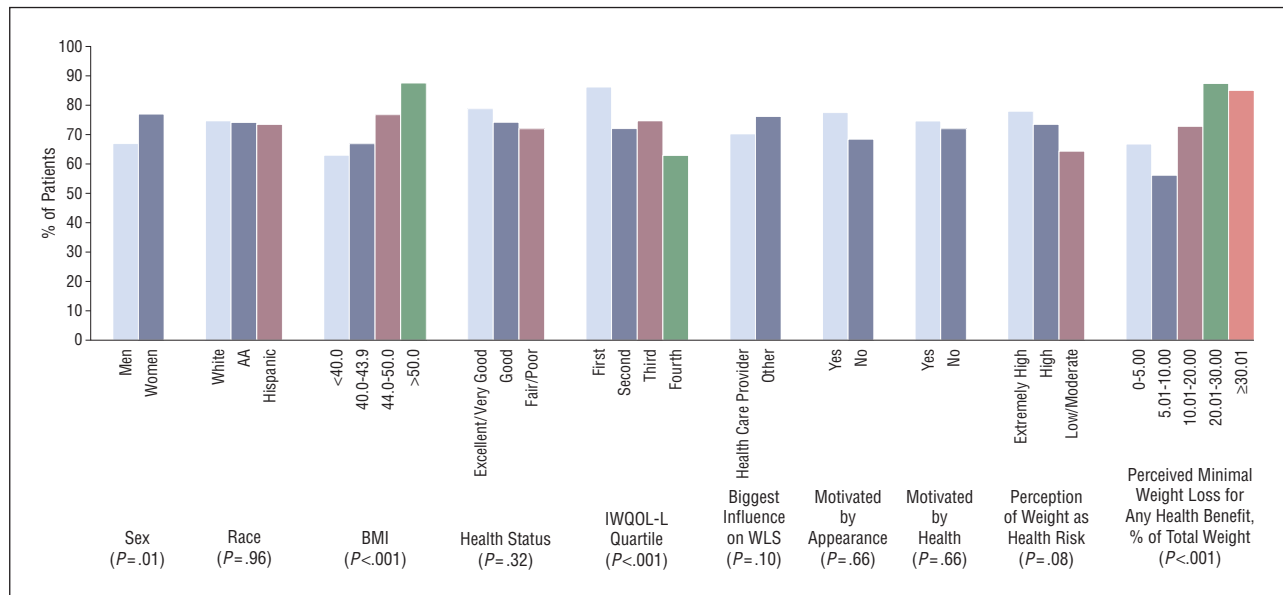
**Figure 2** shows the proportion of patients willing to accept a 10% or higher risk of dying to undergo WLS. Men and white patients were independently associated with being more willing to accept high risks, after adjusting for other demographic factors, BMI, and recruitment site (Table 4). Having a high disappointing weight loss was not associated with a willingness to accept higher risk. Those with heart disease and poorer quality-of-life scores were significantly more likely to accept a high mortality risk. Other factors examined were not important correlates.

### COMMENT

In our study of 654 patients seeking WLS, patients in general had high weight loss expectations of WLS, with three-quarters of patients reporting that they would be disappointed with a long-term sustained weight loss of 20% and two-thirds with an EWL of 50%, although these levels of weight loss are considered successful outcomes clinically. Most patients (84.8%) were willing to accept some risk of dying to undergo WLS, but a much smaller majority (57.5%) were willing to do so to undergo a hypo-

thetical treatment that would produce a sustained weight loss of 20%. Moreover, one-fifth of patients were willing to accept a 10% or higher risk of dying to undergo WLS. Women were more likely than men to have high weight loss expectations but were less likely to accept a high mortality risk. White patients appeared more likely than African American patients to have high weight loss expectations and were more willing to accept a high risk after adjusting for other demographic factors and BMI; racial differences, however, were attenuated when we accounted for quality-of-life scores, which were lower among white patients.

Although others have suggested that patients seeking weight loss treatment have unrealistic weight loss expectations,<sup>16,18</sup> our study corroborates and extends published data by documenting that patients seeking WLS on average value substantial weight loss more than they value achieving perfect health. Patients were willing on average to accept a higher mortality risk to achieve ideal weight than to achieve perfect health. When we looked at correlates of those who would be disappointed with a 20% weight loss or a loss of 50% of EWL and those who were willing to accept a higher than 10% risk of mortal-



**Figure 1.** Proportion of patients who anticipate being disappointed with a weight loss of 20% of initial weight across different subgroups. AA indicates African American; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); IWQOL-L, Impact of Weight on Quality of Life–Lite; and WLS, weight loss surgery.

**Table 4. Factors Associated With Disappointment With a 20% Weight Loss and Willingness to Accept a Mortality Risk of at Least 10% to Undergo Weight Loss Surgery<sup>a</sup>**

	Disappointment With 20% Weight Loss <sup>b</sup>		Willing to Accept ≥10% Risk	
	Model 1 (n = 628)	Model 2 (n = 572)	Model 1 (n = 624)	Model 2 (n = 602)
BMI	1.09 (1.05-1.12)	1.08 (1.04-1.12)	1.01 (0.98-1.04)	0.99 (0.97-1.02)
Sex				
Men	0.51 (0.33-0.79) <sup>c</sup>	0.53 (0.33-0.86) <sup>c</sup>	2.09 (1.33-3.28) <sup>c</sup>	2.27 (1.40-3.69)
Women	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Race				
White	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
African American	0.55 (0.32-0.97) <sup>c</sup>	0.74 (0.40-1.36)	0.50 (0.26-0.94) <sup>c</sup>	0.56 (0.29-1.09)
Hispanic/other	0.73 (0.42-1.26)	0.59 (0.32-1.07)	0.66 (0.36-1.20)	0.58 (0.31-1.09)
Heart disease	NA	NA	NA	3.66 (1.72-7.77) <sup>c</sup>
IWQOL-L (10-point higher score)	NA	0.85 (0.74-0.97) <sup>c</sup>	NA	0.77 (0.66-0.89) <sup>c</sup>
Perceived minimal weight loss needed to gain any health benefit, %	NA		NA	NA
0-5.00		0.64 (0.33-1.22)		
5.01-10.00		0.44 (0.26-0.74) <sup>c</sup>		
10.01-20.00		1 [Reference]		
20.1-30.00		2.30 (1.20-4.43) <sup>c</sup>		
≥30.01		1.35 (0.62-2.91)		

Abbreviations: BMI, body mass index; IWQOL-L, Impact of Weight on Quality of Life–Lite; NA, not applicable.

<sup>a</sup>All models adjusted for age, recruitment site, educational level, income, and factors denoted in the table.

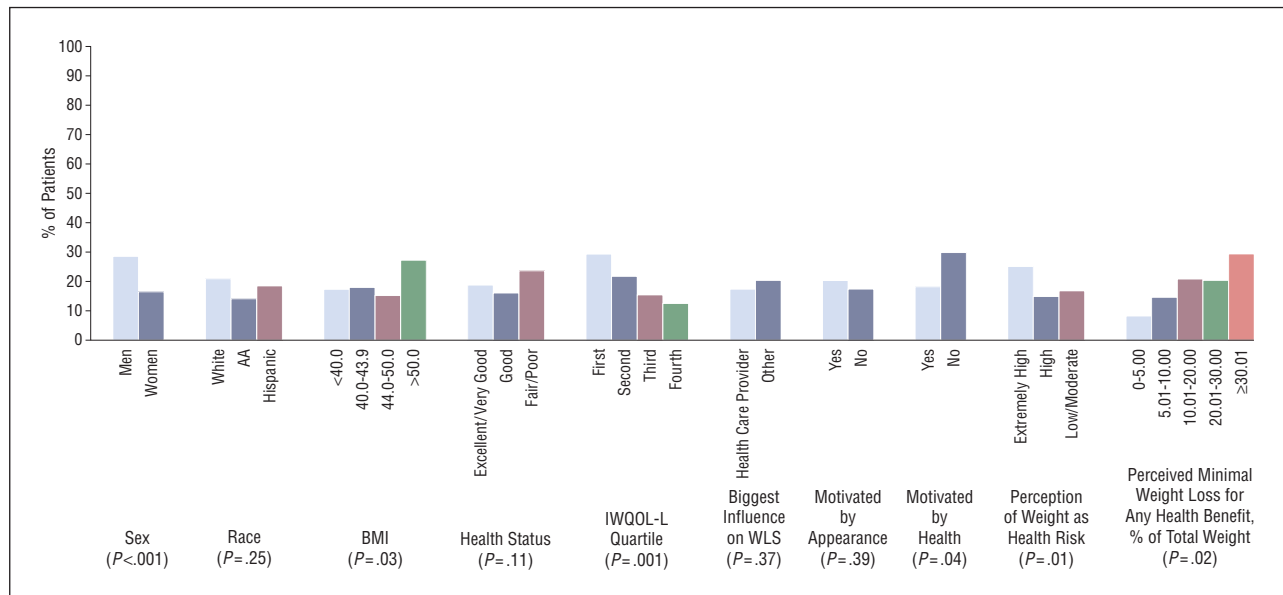
<sup>b</sup>Defined as report that the patient would be disappointed with a sustained weight loss of 20% of their initial weight.

<sup>c</sup>Statistically significant ( $P < .05$ ) estimate.

ity from WLS, patients' quality-of-life scores appeared to be a stronger correlate than health status; with the exception of heart disease, comorbid conditions were not significantly associated with either outcome. These findings are consistent with our hypothesis that quality-of-life considerations may be as important if not more important than health considerations to many patients who seek WLS.

Our findings raise questions about whether patients are informed adequately as they make decisions about

WLS. By the time of the interview, patients had already received some education about the risks and benefits. Patients were quoted weight losses for the short term ranging from 30% to 80% of their excess weight depending on procedures being discussed (ie, 60%-80% EWL for gastric bypass and 30%-70% for gastric banding) at the recruitment practices. Although weight regain and recidivism were discussed, patients were not given explicit weight loss estimates for the longer term. Therefore, patients' high expectations for the long term likely reflect



**Figure 2.** Proportion of patients willing to accept a mortality risk of 10% or higher among different subgroups. AA indicates African American; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); IWQOL-L, Impact of Weight on Quality of Life–Lite; and WLS, weight loss surgery.

the short-term estimates they were given before WLS. One-third of patients in our study reported the belief that they needed to lose more than 20% of their weight to derive any health benefits, although strong evidence suggests that even modest weight losses of 5% to 10% can improve metabolic factors and health risks.<sup>2,23</sup> Although the major WLS procedures are associated with some mortality risk, a substantial minority of patients were unwilling to accept any mortality risk to undergo surgery, and more than 40% were unwilling to risk death to sustain a 20% weight loss. This finding is consistent with their expectation that WLS should produce a weight loss that is substantially higher than 20%. These findings persist despite previous long-term studies<sup>3</sup> suggesting that a 20% weight loss is a reasonable outcome for many patients with evidence of reductions in comorbidities.<sup>3,11</sup> Having high weight loss expectations was not associated with being willing to accept higher than reasonable surgical risks, which is somewhat reassuring. Whether high expectations will result in later dissatisfaction among patients who achieve the amount of weight loss expected after successful bariatric surgery is unknown and will be addressed by our group when longitudinal follow-up data from the ABS Study become available.

In our study, African American patients and men were less likely to have high weight loss expectations after adjusting for BMI and other demographic factors. This finding is consistent with previous literature suggesting different preferences for weight loss between white and African American patients and may explain the lower utilization of WLS in racial minorities.<sup>24-27</sup> White women in particular were much more likely than men or African American women to have overly optimistic weight loss expectations, and this difference may reflect different societal standards for ideal weight in these different groups. Future studies will need to compare the weight loss preferences of white and minority populations in primary care or community settings to examine whether our

findings generalize to obese patients who are medically eligible for WLS.

Our study should be interpreted in the context of its limitations. Although our study sample is large and demographically diverse by design, all patients were recruited from 2 WLS centers in Boston. Most of our data were self-reported and may be biased by the educational level and health literacy of our subjects, especially with regard to our standard gamble and preference questions, which are cognitively challenging and require reasonable numeracy. To address this issue, our survey was designed with multiple follow-up questions and was administered by a trained interviewer; we also adjusted our multivariable models for educational status. Nonetheless, residual bias may remain. Finally, patients were interviewed before WLS and after they were seen at WLS centers; however, their perceptions and understanding may have evolved over time after the interview with additional discussions with their providers.

In summary, our study finds that obese patients seeking WLS value substantial weight loss more than they do perfect health. Most of the patients also have high weight loss expectations of WLS, and one-fifth were willing to accept a mortality risk greater than 10% to undergo these procedures. Poorer quality of life was a significant correlate of high weight loss expectations and the willingness to accept high risk, whereas health status was less influential, suggesting the importance of quality-of-life considerations. Given patients' misperceptions, clinicians should ensure that patients are educated adequately about the potential risks and sustained benefits of WLS so that patients make truly informed decisions about WLS.

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