

Accuracy of Self-Reported Height and Weight Among Sleeve Gastrectomy Patients with Disordered Eating

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Published online: 14 November 2016
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Keywords Obesity · Bariatric surgery · Sleeve gastrectomy · Weight and height · Loss-of-control eating · Overeating · Inaccurate reporting

Introduction

Changes in weight or body mass index (BMI) are primary outcomes in the bariatric surgery field, and ascertaining accurate weight and height measurements is critically important. While measured anthropometric data is certainly preferred, this is often not possible; for example, epidemiological and follow-up clinical research studies often must rely on self-reported data. In the bariatric surgery field, there exist few data on accuracy of self-reported height and weight [1].

In the general population, research suggests that reported and measured weights are correlated highly [2]; however, individuals tend to underreport weight and overestimate height [3] resulting in inaccurate BMI estimations. Greater BMI has been related to greater error in self-reported weight [4], although greater BMI coupled with disordered eating is not related to greater error [5–7]. For example, preliminary studies

on individuals with binge-eating disorder and overweight/obesity suggest discrepancies in reported and actual weight are minimal and the degree of weight error is not related to eating disorder features or BMI. Although greater BMI is generally related to greater inaccuracy in self-reported weight, researchers have speculated that disordered eating among those with greater BMI may heighten awareness of weight, ultimately improving accuracy [6].

To date, only one study has examined accuracy of self-reported weight and height among bariatric surgery candidates [1]. This study, performed with candidates seeking gastric bypass, yielded three primary findings. Candidates for gastric bypass were accurate reporters of weight and height, the degree of misreporting was not related to BMI or to eating disorder features, and Black women were more likely to underestimate BMI compared to White women [1]. A second study, which examined accuracy of self-reported weight, but not height, following Roux-en-Y gastric bypass or laparoscopic adjustable gastric band, reported that self-reported weight differed little from measured weight and the degree of misreporting was not related to BMI [8]. These findings for bariatric surgery patients echo those for patients with binge eating and comorbid obesity [5–7]. Whether these findings for gastric bypass and adjustable band patients generalize to patients who undergo other forms of bariatric surgery is unknown. Importantly, no study has investigated accuracy of reported weight and height after bariatric surgery; such data could be informative for designing follow-up assessment protocols. Thus, the purpose of the present study was to examine accuracy of self-reported height, pre-surgical weight, and current weight in a group of patients who underwent sleeve gastrectomy surgery. In this study, we focused on a specific subgroup of patients post-surgically—i.e., those who reported struggling with disordered eating and particularly loss-of-control (LOC) eating, a known predictor of poorer weight loss outcomes following bariatric surgery [9].

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Materials and Method

Participants

Participants were 64 treatment-seeking individuals reporting LOC eating approximately six months following sleeve gastrectomy surgery. Inclusion criteria required age 18 to 65 years and LOC eating (defined as having a sense of loss of control while eating and/or difficulty stopping while eating regardless of the quantity consumed at least once weekly over the past 4 weeks). Exclusion criteria were medications that influence weight/eating and current substance dependence or severe psychiatric illness that required immediate treatment. Informed consent was obtained from all individual participants included in the study. The majority of participants were female ($n = 55$; 85.9%); 51.6% ($n = 33$) identified as White, 31.3% ($n = 20$) Black or African American, 15.6% ($n = 10$) Hispanic, and 1.5% ($n = 1$) “Other.” Participant mean age and BMI were 47.1 (SD = 10.2) years and 38.2 (SD = 8.1) kg/m², respectively.

Assessments

The Eating Disorder Examination (EDE [10]) is a semi-structured, investigator-based interview which assesses eating disorder psychopathology and disordered eating behaviors such as subjective binge-eating episodes (SBEs; LOC eating without eating an unusually large quantity of food). The EDE has demonstrated good inter-rater reliability and test-retest reliability in clinical studies [10].

As part of the initial assessment, participants were asked to report height, pre-surgical weight, and current weight. Weight was subsequently measured using a high-capacity digital scale after participants reported current and pre-surgical weight. Pre-surgical weight and measured height were obtained from the bariatric surgery program.

Self-reported pre-surgical weight and self-reported height were used to calculate self-reported pre-surgical BMI, while measured pre-surgical weight and measured height were used to calculate measured pre-surgical BMI. Self-reported current weight and self-reported height were used to calculate self-reported current BMI, while measured current weight and measured height were used to calculate measured current BMI.

Statistical Analyses

Paired *t* tests were used to test the discrepancy between measured and reported height, pre-surgical weight, and current weight. Correlation analyses were used to test the relationship between degree of discrepancies in height, weight, and BMI with eating disorder features and BMI. As previously defined [1], weight accuracy was defined as overestimating or underestimating weight by less than 5 lb. In addition, this 5-lb cut point was the natural cut point in the distribution of the present sample.

Results

Table 1 summarizes actual (measured) and estimated (reported) measurements for height, pre-surgical weight, current weight, and corresponding pre-surgical and current BMIs and presents correlations and paired *t* tests for actual and measured variables. Correlations between all measured and reported variables were significant, and paired *t* tests did not significantly differ for measured and reported height, measured and reported pre-surgical weight, measured and reported current weight, measured and reported pre-surgical BMIs, or measured and reported current BMIs.

Figure 1 presents the degree of current weight discrepancy in pounds. The majority of the participant group ($n = 49$; 76.6%) were “accurate” reporters, defined as less than 5-lb

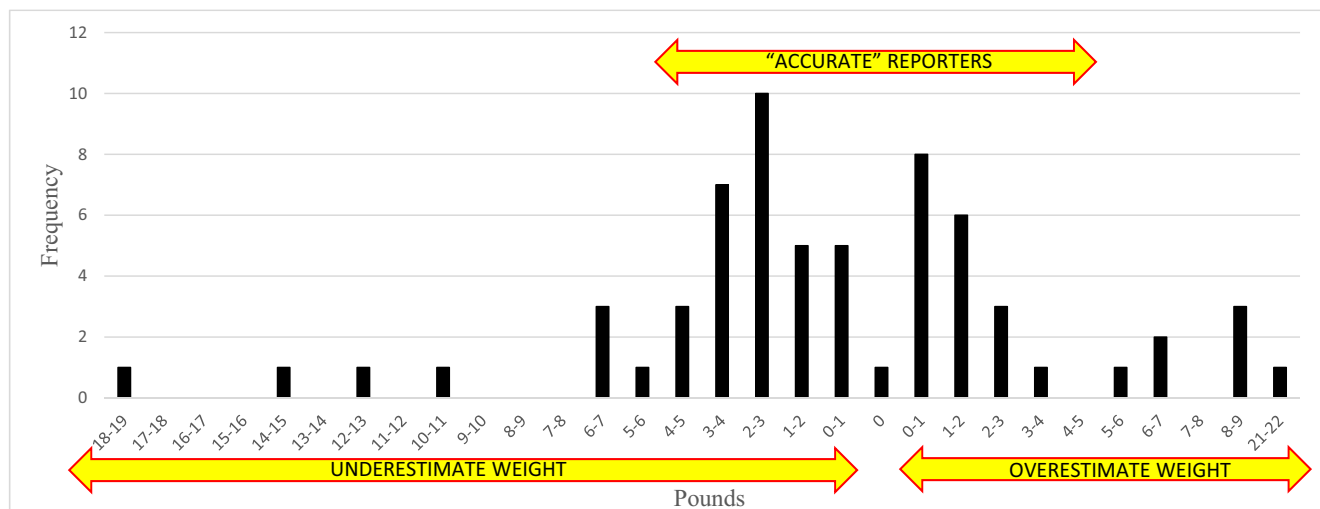
Table 1 Measured and self-reported height, pre-surgical weight, current weight, and corresponding BMI

	Measured		Reported		Correlation r^a	Discrepancy		<i>t</i>	<i>p</i> value
	<i>M</i>	SD	<i>M</i>	SD		<i>M</i>	SD		
Height (in.)	65.06	3.46	65.10	3.51	.988***	−0.04	0.54	0.58	.563
Pre-surgical weight (lb)	295.03	77.68	292.67	74.83	.959***	2.36	21.91	−0.86	.393
Current weight (lb)	232.03	60.43	231.05	60.00	.996***	0.98	5.56	−1.42	.162
Pre-surgical BMI (kg/m ²)	48.61	10.25	48.15	9.57	.928***	0.46	3.82	0.96	.343
Current BMI (kg/m ²)	38.22	8.07	38.02	8.05	.991***	0.20	1.06	1.49	.143

$n = 64$

*** $p < .0005$

^a Measured and reported variables



N=64. “Accurate” defined as <math> < 5 </math> lb discrepancy

Fig. 1 Discrepancy (in pounds) between self-reported and measured current weight. $n = 64$. “Accurate” defined as <math> < 5 </math>-lb discrepancy

discrepancy between actual and reported current weight. Of those who were “inaccurate” ($n = 15$; 23.4%), seven overestimated weight and eight underestimated weight.

The degree of discrepancy for measured and reported weight, height, and BMI variables (both pre-surgical and current) was in all cases non-significant and minimally correlated with eating disorder psychopathology (EDE Global), SBEs, and BMI. Correlations ranged from -0.055 to $.122$, and p values ranged from $.338$ to $.918$. Neither sex nor race was associated significantly with any discrepancy (height, pre-surgical weight, current weight, pre-surgical BMI, or current BMI); however, age was associated significantly with pre-surgical weight ($r = -0.274$, $p = .028$) and pre-surgical BMI ($r = -0.315$, $p = .011$), but not with height, current weight, or current BMI.

Discussion

Two primary findings emerged from this study of patients with LOC eating following sleeve gastrectomy surgery. First, participants were generally accurate reporters of height, pre-surgical weight, and current weight and discrepancies in actual versus reported measurements were minimal. Nearly 80% of patients were accurate reporters of weight or misestimated current weight by less than 5 lb. Second, our findings indicate that the degree of discrepancy for all measurements (height, pre-surgical weight, current weight, pre-surgical BMI, and current BMI) was not related to eating disorder psychopathology, SBEs, or BMI. Age was significantly related to discrepancies in pre-surgical weight and pre-surgical BMI; younger age was associated with greater error. These findings replicate and extend previous findings from Roux-en-Y gastric bypass candidates [1] and post-operative Roux-en-Y gastric bypass and laparoscopic adjustable band patients [8]; one

notable exception was that we failed to observe a reporting bias associated with race [1]. This discrepancy may be due to differences in sampling (candidates versus post-operative bariatric patients) and bariatric procedure (gastric bypass versus sleeve gastrectomy). Our findings also mirror those suggesting that individuals with obesity and binge-eating disorder [5–7] (which involves LOC eating) are accurate reporters of weight, but differ in the degree of error in height estimation. It may be that individuals who have undergone bariatric surgery have greater awareness of height and weight measurements due to repeated bariatric appointments where measurements may be obtained. Importantly, our findings also extend previous research by lending support for the accuracy of self-reported height and weight at the six-month post-operative period and retrospectively for pre-surgical weight. When there are limits to obtaining measured anthropometric data, our findings indicate that asking patients will provide valid results nearly 80% of the time.

Findings should be interpreted based on study strengths and limitations. To our knowledge, this is the first study to report accuracy of weight and height among post-sleeve gastrectomy surgery patients. While this is a strength of the study, findings may not generalize to other bariatric procedures or to bariatric patients without disordered eating. Second, due to the limited sample size, we were unable to conduct more fine-grained analyses. Future research should examine group differences based on accuracy and compare groups who underestimate versus overestimate weight. Finally, the present study examined accuracy of weight and height six months post-surgery and it is unknown whether post-operative patients continue to accurately report height and weight long-term. Future research should examine accuracy of self-reported height and weight at multiple assessments post-surgery.

In summary, sleeve gastrectomy patients with disordered eating are generally accurate reporters of height, pre-surgical weight,

and current weight six months post-operatively and the degree of discrepancy is not systematically related to eating disorder psychopathology, SBEs, or BMI. Self-reported height and weight may provide accurate measurements for BMI change in retrospective and short-term longitudinal designs when warranted.

Compliance with Ethical Standards

Conflict of Interest Drs. Ivezaj and Grilo declare no conflicts of interest. Outside the submitted work, Dr. Grilo reports personal fees from Shire and Sunovion, royalties from Guilford Press Publishers and Taylor & Francis Publishers, and honoraria from the American Psychological Association, Vindico CME, American Academy CME, and Medscape and Global Medical CME.

Ethical Approval All procedures in studies involving human participants were in accordance with the ethical standards of the institution and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Funding NIH R01 DK098492 (Dr. Grilo)

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

- White MA, Masheb RM, Burke-Martindale C, et al. Accuracy of self-reported weight among bariatric surgery candidates: the influence of race and weight cycling. *Obesity (Silver Spring)*. 2007;15(11):2761–8.
- Kuczmarski MF, Kuczmarski RJ, Najjar M. Effects of age on validity of self-reported height, weight, and body mass index: findings from the Third National Health and Nutrition Examination Survey, 1988–1994. *J Am Diet Assoc*. 2001;101(1):28–34. quiz 5–6
- Connor Gorber S, Tremblay M, Moher D, et al. A comparison of direct vs. self-report measures for assessing height, weight and body mass index: a systematic review. *Obes Rev*. 2007;8(4):307–26.
- Villanueva EV. The validity of self-reported weight in US adults: a population based cross-sectional study. *BMC Public Health*. 2001;1:11.
- Barnes RD, White MA, Masheb RM, et al. Accuracy of self-reported weight and height and resulting body mass index among obese binge eaters in primary care: relationship with eating disorder and associated psychopathology. *Prim Care Companion J Clin Psychiatry*. 2010;12(4)
- Masheb RM, Grilo CM. Accuracy of self-reported weight in patients with binge eating disorder. *Int J Eat Disord*. 2001;29(1):29–36.
- White MA, Masheb RM, Grilo CM. Accuracy of self-reported weight and height in binge eating disorder: misreport is not related to psychological factors. *Obesity (Silver Spring)*. 2010;18(6):1266–9.
- Christian NJ, King WC, Yanovski SZ, Courcoulas AP, Belle SH. Validity of self-reported weights following bariatric surgery. *JAMA*. 2013;310(22):2454–6.
- Devlin MJ, King WC, Kalarchian MA, White GE, Marcus MD, Garcia L, et al. Eating pathology and experience and weight loss in a prospective study of bariatric surgery patients: 3-year follow-up. *Int J Eat Disord* 2016.
- Fairburn CG, Cooper Z. *The Eating Disorder Examination (12 edition)*. In: Fairburn CG, Wilson GT, editors. *Binge eating: nature, assessment, and treatment*. New York: Guilford Press; 1993. p. 317–60.