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Body Image and Quality of Life Among Postsurgical Bariatric Patients

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BODY IMAGE AND QUALITY OF LIFE

AMONG POSTSURGICAL BARIATRIC PATIENTS

by

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ABSTRACT

BODY IMAGE AND QUALITY OF LIFE
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In recent decades, bariatric surgery has become an increasingly popular intervention for the treatment of morbid obesity. Bariatric surgery leads to substantial improvements in physical health (e.g., weight loss, increased life expectancy) and psychological health (e.g., body image, quality of life). After bariatric surgery, many patients undergo subsequent surgical procedures to remove excess skin ("body contouring"), which are also associated with positive medical and psychological outcomes.

The present study sought to expand upon existing research into the psychosocial outcomes of bariatric surgery, investigate correlates of patients' desire for body contouring, and determine whether presurgical motivations were associated with postsurgical outcomes. Seventy-nine adult postoperative bariatric patients completed a computer-based survey containing measures of body image (Multidimensional Body-Self Relations Questionnaire [MBSRQ]), quality of life (Impact of Weight on Quality of Life Questionnaire-Lite [IWQOL-Lite]), body image quality of life (Body Image Quality of Life Inventory [BIQLI]), desire for body contouring surgery, and presurgical motivations.

A hierarchical multiple regression found that weight loss was associated with improvements in body image and quality of life – but not body image quality of life. Although most patients reported dissatisfaction with their abdominal region after surgery, a linear

regression failed to identify a relationship between patients' body dissatisfaction and their desire for body contouring surgery. However, a paired-samples t-test found that patients were significantly more likely to express an interest in body contouring surgery if finances were not a factor, suggesting that the cost of these procedures may be prohibitive to many. Finally, content coding of patients' self-reported motivations found that health-related reasons were the most commonly cited reason for pursuing bariatric surgery, identified by more than half of participants. Despite predictions, an independent samples t-test found that patients who identified appearance-related reasons for pursuing bariatric surgery did not differ on measures of body image. Subsequent independent samples t-tests failed to identify any association between presurgical motivations and postsurgical weight loss.

Although limitations of this study included its small sample size and single-site methodology, its results serve to validate existing research while expanding upon the understudied topics of body contouring and presurgical motivations.

To my mentors, past and present.
Thank you for believing in me when I didn't want to.

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I recall sitting in the office of my favorite college professor, Dr. Dennis Schell, dejected after an unsuccessful round of graduate school applications. I wallowed in dramatic, 21-year-old self-pity as Dr. Schell shared with me some wisdom I've never forgotten. As long as I didn't give up, he assured me, my success was not a matter of if, but when. This philosophy has since carried me through countless challenges – not least of all the three-year journey of completing this dissertation. However, this journey could not have been completed were it not for those who helped me along the way.

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Introduction

Since the 1980s, the phrase "obesity epidemic" has rooted itself firmly into the American vernacular. Obesity, classified as a disease by the American Medical Association (AMA) in 2013, is a condition marked by excessive body fat and correlated with numerous adverse health outcomes. Obesity is associated with such medical complications as type 2 diabetes, cardiac conditions, cancer, sleep difficulties, and stroke (Centers for Disease Control [CDC], 2016). Obesity-related medical costs account for a significant portion of the national budget, with annual economic costs in excess of $215 billion (Hammond & Levine, 2010) and predicted to account for $344 billion by 2018 if current weight trends continue (Thorpe, 2009).

Most studies to date have defined obesity according to the descriptive categories of the Body Mass Index (BMI). The BMI is a formula used to approximate an individual's amount of body fat, which is calculated by dividing weight in kilograms by height in square meters. The resulting number can then be used to categorize the individual as underweight (BMI < 18.5), normal weight (18.5 – 24.9), overweight (25.0 – 29.9), or obese (≥ 30.0). The World Health Organization (2000) sets additional cutoffs for class I obesity (30.0 – 34.9), class II obesity (35 – 39.9), and class III obesity (≥40.0), also referred to as "morbid obesity." Elsewhere in the research literature, designations have been made for "super obesity" (≥50.0) and "super-super obesity" (≥60.0).

It should, however, be noted that use of the BMI in research has been scrutinized in the literature (e.g., Burkhauser & Cawley, 2008; Prentice & Jebb, 2001). Critics argue that the BMI can be misleading, as the formula does not differentiate between fat and lean body mass (e.g., muscle, bone). Additionally, the correlation between body fat and a given BMI varies between groups. Women typically have more body fat than men of equivalent BMIs (Burkhauser & Cawley, 2008), older adults typically have more body fat than young adults of equivalent BMIs, (Prentice & Jebb, 2001), and Asian individuals typically have more body fat than African American individuals of equivalent BMIs (Deurenberg, Yap, & Van-Staveren, 1998). Although alternatives to the BMI (e.g., waist-to-hip ratio) show promise in predicting adverse health outcomes (Kragelund & Omland, 2005), the majority of obesity research continues to use the BMI because it is simple to calculate and does not require the use of additional measurements or materials (e.g., tape measures, calipers).

The breadth of the obesity crisis warrants particular concern. For decades, obesity rates surged among U.S. adults and children (Ogden, Carroll, Kit, & Flegal, 2012), with rates of extreme obesity increasing exponentially (Sturm & Hattori, 2013). During 2011-2012, more than one third of American adults (34.9%) and nearly 17% of children and adolescents were found to be obese (Ogden, Carroll, Kit, & Flegal, 2014). Between 2000 and 2010, rates of morbid obesity increased by 70%, while super-morbid obesity rates increased more than tenfold (Sturm & Hattori, 2013). Projections estimate that 51.1% of Americans may be obese by 2030, with a suggested economic impact of $860.7 to $956.9 billion annually (Wang, Beydoun, Liang, Caballero, & Kumanyika, 2008). While recent evidence suggests that obesity rates may finally be leveling off among adults and even declining among preschool-aged children in some states (Ogden et al., 2012; Ogden et al., 2014), the obesity rate among Americans remains an issue of serious concern.

As overall obesity rates rise, demographic differences in these rates have become apparent. Although no state had an obesity rate of less than 20% in 2014, obesity rates have historically trended significantly higher in the South and Midwest regions of the U.S. compared to the Northeast and West (CDC, 2015). Even neighborhood-level factors appear to influence obesity rates: In New York City, availability of specific amenities (e.g., grocery stores, restaurants, commercial retail space, fitness centers) was associated with lower neighborhood levels of obesity, while neighborhood violence and the presence of emergency food banks were associated with higher levels (Black, Macinko, Dixon & Fryer, 2010).

Additionally, racial and gender differences have emerged in the prevalence of obesity. CDC data show 43% higher obesity rates among African Americans and 26% higher obesity rates among Hispanics compared to Caucasians (Ogden et al., 2014). From 1999 to 2010, the obesity rate among U.S. men rose significantly, while there was no statistically significant increase in women's overall obesity rates (Flegal, Carroll, Kit, & Ogden, 2012). However, women in the U.S. are more likely to be obese than men (38.3% vs. 34.3%; Ogden, Carroll, Fryar, & Flegal, 2015), and obesity rates among African American and Mexican American women in particular have increased in recent years. The racial differences found in obesity rates may be partially attributable to socioeconomic factors. Wang and Beydoun (2007) found that adults in low socioeconomic status groups were significantly more likely to be obese. Education level and income appear to be especially predictive of outcomes among women, with college degrees and higher incomes correlated with reduced risk for obesity (Ogden, Lamb, Carroll, & Flegal, 2010).

The obesity epidemic cannot be attributed to any one cause, but some place the blame on environmental changes, such as Americans' increasing reliance on cars, decreasing levels of physical activity, and increased viewing of televised entertainment (Jeffery & Utter, 2003). Alarmingly, in 2011, the average U.S. adult engaged in 5.5 hours of daily "screen time" (i.e., television, computer, smartphone; eMarketer, 2015), and a meta-analysis by Pearson and Biddle

(2011) demonstrated a relationship between sedentary behavior (primarily television-viewing) and consumption of fast food, high-caloric snacks and beverages, and total caloric intake.

Other studies have examined trends in consumption habits. For example, data from the Continuing Survey of Food Intake by Individuals (CSFII) found increased caloric intake among meals eaten both at home and away from home for Americans in 1994-1996 (i.e., consuming 200 more calories daily) compared to 1977-1978 (Young & Nestle, 2002). During this timeframe, portion sizes for meals eaten at home and away from home also rose significantly (Nielsen & Popkin, 2003). Currently, the vast majority of Americans fall short of recommended nutritional guidelines. Among the U.S. population ages 1 and above, added sugars, saturated fats, and sodium are consumed in excess by 70%, 71%, and 89%, respectively, while 87% of Americans consume fewer vegetables than recommended (U.S. Department of Health and Human Services, 2015).

For obese adults—particularly those who developed the condition early in life—the long-term implications of obesity are grim. Obese adults face reduced life expectancy (Fontaine, Redden, Wang, Westfall, & Allison, 2003), especially when combined with other health risk factors such as smoking (Peeters et al., 2003). The degree of obesity may have a significant impact on life expectancy: Kitahara et al. (2014) found that compared to those with a normal-weight BMI, a BMI between 40 and 40.9 was associated an estimated loss of 6.5 years of life, compared with 13.7 years lost among those with a BMI between 55-59.9. Fontaine et al. (2003) found that overweight and obese young adults, compared to older adults, faced shorter life expectancies.

Studies suggest that adults who remain overweight throughout early adulthood (age 19 to 35 years) are three times more likely to report chronic health conditions than adults who became overweight later in life (Clarke, O'Malley, Schulenberg, & Johnston, 2010). Early-onset obesity is also associated with higher rates of lower-body disability at midlife (ages 45+) and has a lasting impact on physical health, even after weight loss (Ferraro & Kelley-Moore, 2003). Only regular exercise appears to negate the impact of obesity in early adulthood.

As U.S. obesity rates grow, so does the industry developed in its wake. The weight loss market, which encompasses various food products, dietary supplements, and structured weight loss programs (e.g., Weight Watchers, Jenny Craig, Nutrisystem), is a growing industry recently estimated at $64.0 billion in the U.S. alone, with a projected annual growth of over 2% (Marketdata Enterprises, 2015). As the current prevalence of obesity would suggest, however, the weight loss industry has done little to elicit effective, lasting weight loss.

Meta-analyses comparing various diets, including low fat and high-protein/low-carbohydrate diets, have found little to no difference in weight loss outcomes (Ajala, English, & Pinkney, 2013; Wycherley, Moran, Clifton, Noakes, & Brinkworth, 2012). Rather, variability in weight loss outcomes appears best accounted for by participants' adherence to their respective diet plans (Pagoto & Appelhans, 2013). Other studies examining predictors of weight loss success yielded similar results: Byrne, Barry, and Petry (2012) found that treatment attendance and changes in exercise self-efficacy were predictive of weight loss success among adult participants.

Maintenance of weight loss appears to be an even more considerable challenge, with the vast majority of initially successful individuals gaining back some or all of the weight lost (Mann et al., 2007). Cooper et al. (2010) compared the long-term outcomes of different weight loss treatments, with a particular emphasis on behavior therapy (BT) and cognitive behavioral therapy (CBT). After 44 weeks of treatment, the findings appeared positive, with participants losing an average of 9.0% of their initial weight. One year after treatment, however, BT recipients regained an average of 43.5% of weight lost, while CBT recipients regained an average of 58.0%. After three years, these amounts rose to 89.8% (BT) and 88.6% (CBT).

A meta-analysis by Mann et al. (2007) examined the long-term outcomes of dieters in the years following their weight loss. Despite initial weight losses averaging 30.8 pounds, participants regained an average of all but 6.6 pounds at follow-up. In many instances, participants actually gained back *more* weight than they had lost in the first place. The percentage of participants experiencing this disproportionate weight regain ranged from a low of 29% to a high of 64%. In other words, nearly one to two thirds of participants regained more weight than they had initially lost on restricted calorie diet plans.

In recent years, several studies have focused on the role of physical activity in maintaining weight loss. Physical activity in conjunction with dieting appears to lead to greater initial weight loss than either intervention alone (e.g., Dombrowski, Knittle, Avenell, Araujo-Soares, & Sniehotta, 2014; Jakicic, 2009). In a 24-month follow-up study, Jakicic, Marcus, Lang, and Janney (2008) did not identify any significant weight loss outcomes among individuals assigned to different types of exercise groups. However, they found that individuals who maintained a loss of at least 10% of initial body weight reported performing significantly more physical activity (approximately 275 minutes per week). The American College of Sports Medicine currently recommends engaging in at least 200 minutes of exercise per week to prevent weight regain, with the philosophy that "more is better" (Donnelly et al., 2009, p. 462).

Although weight regain is a common occurrence following weight loss, research suggests that recurrent patterns of weight loss and regain can have adverse effects on physical and psychological health. These patterns, known as "weight cycling" or "yo-yo dieting," are associated with binge eating (Venditti, Wing, Jakicic, Butler, & Marcus, 1996), life dissatisfaction (Brownell & Rodin, 1994), poor perceptions of physical health (Venditti et al., 1996), abdominal fat accumulation (Cereda et al., 2011), and higher BMIs (Cereda et al., 2011; Field et al., 2004). Early research even suggested that weight cycling may be associated with increased risk of metabolic dysfunction, susceptibility to type II diabetes, mortality from coronary heart disease, and all-cause mortality (e.g., Brownell & Rodin, 1994; Diaz, Mainous, & Everett, 2005; Dyer, Stamler, & Greenland, 2000). However, recent studies have failed to support these findings (e.g., Field et al., 2004; Mason et al., 2013; Stevens et al., 2012).

In addition to the physical consequences of obesity, the condition may also be associated with numerous negative mental health outcomes, including mood disorders, anxiety, binge eating, and psychosocial difficulties. Puhl and Brownell (2006) found that overweight and obese individuals were more likely to experience low self-esteem and symptoms of depression than their peers of normal weight, with average scores among heavier participants falling within the mildly clinical range of the Beck Depression Inventory (BDI). Among heavier participants, obese individuals were more likely than overweight individuals to receive elevated BDI scores. However, other studies have failed to demonstrate a link between depression and obesity in individuals with BMIs below 35.0 (Scott et al., 2008) or 40.0 (Talen & Mann, 2009). In addition, a worldwide survey of over 62,000 individuals found only modest (but statistically significant) correlations between obesity and mental illness, including depression and anxiety disorders (Scott et al., 2008); however, these associations appeared to be limited to women and severely obese individuals (BMI > 35.0).

The relationship between obesity and disordered eating is considerably more established (e.g., de Zwaan, 2001; Hill, 2007; Talen & Mann, 2009). Obese individuals are more likely to engage in impulsive eating, eat out of boredom, and eat due to negative emotional states (Talen & Mann, 2009). Obese persons are also more likely to receive a diagnosis of binge eating disorder (BED). BED is a pattern of consuming large quantities of food and is characterized by loss of control, eating until uncomfortably full, and feelings of secrecy or shame related to eating behavior. The lifetime prevalence rate of BED among is approximately 3.5% among women and 2.0% among men (Hudson, Hiripi, Pope, & Kessler, 2007). An estimated 42% of individuals with BED are obese (Hudson et al., 2007), and the likelihood of diagnosis goes up as the degree of obesity increases (Hill, 2007). Approximately 30% of individuals presenting for behavioral weight loss treatment and 27% of individuals presenting for surgical weight loss treatment meet criteria for BED (de Zwaan, 2001; Zimmerman et al., 2007). Among patients presenting for surgical weight loss, between 1.9% and 8.9% also endorse symptoms of night eating syndrome, an eating disorder characterized by a disproportionate consumption of calories at night and/or waking up from sleep to eat (Allison et al., 2006).

Obesity appears to have a negative correlation with self-esteem and psychosocial functioning. Schwartz and Brownell (2004) theorized that stigmatization against the obese, combined with a societal preference for thinness, may be internalized by obese individuals and results in reduced self-esteem. However, the authors noted that not all obese individuals experience deficits in self-esteem. They also suggest that obesity may be experienced differently across race, age, gender, and other dimensions. Based on analysis of the literature, Schwartz and Brownell (2004) identified several pertinent risk factors for low self-esteem among the obese, including being female, engaging in binge eating, and experiencing more extreme degrees of obesity. Other risk factors include age of obesity onset (with earlier onsets correlated with greater body dissatisfaction), a positive history of weight-based teasing, and a history of up-and-down weight cycling.

The relationship between obesity and quality of life (QOL) has attracted increased attention in recent years. Compared to normal weight individuals, obese individuals report poorer physical health (Kolotkin et al., 2003), more frequent sexual dysfunction (Moore et al., 2013), and more frequent weight-based stigma in dating situations, medical settings, and the workplace (Phelan et al., 2015; Puhl & Heuer, 2009). The impact of weight on QOL will be discussed in more detail below.

Bariatric Surgery

Surgical weight loss procedures (collectively referred to as bariatric surgery) have been part of the treatment of severe obesity for over 60 years (Saber, Elgamal, & McLeod, 2008). Due to surgical advancements, including the increasing use of laparoscopic procedures (now over 90%; Nguyen et al., 2011)—as well as their success rates—bariatric surgery has become a safer and more widely used treatment for morbid obesity. A meta-analysis by Maggard et al. (2005) found surgical interventions to be superior to nonsurgical interventions for severely obese adults (BMI > 40.0).

Decreased mortality rates, improved patient outcomes, and increased insurance coverage have contributed to the growth of bariatric procedures. The popularity of weight loss surgery has skyrocketed in recent years, with an estimated 196,000 procedures performed in the U.S. in 2015 – a growth of 24% since 2011 (American Society for Metabolic & Bariatric Surgeries [ASMBS], 2016). However, ASMBS (2014a) estimates that less than 1% of the population eligible for bariatric surgery utilizes it.

Successful bariatric procedures are associated with numerous positive health outcomes, including decreased body weight, increased life expectancy, and reductions in overall cardiac risk (Brethauer, Chand, & Schauer, 2006), as well as a 40% reduction in overall mortality rates (Adams et al., 2007). Bariatric surgery has also been associated with the eradication of type II diabetes, with remission rates as high as 80% in patients who have undergone a gastric bypass (Chapman, Cunningham, & Pories, 2013).

In addition to these physical outcomes, postsurgical bariatric patients may experience improvements in psychological health. A prospective study of bariatric patients found reductions in the prevalence of depression at 6-12 months and 24-36 months after surgery (de Zwaan et al., 2011). A study by Burgmer and colleagues (2007) also demonstrated a significant reduction in depressive symptoms, which were present in 40.5% of presurgical patients and 17.7% of patients one year after surgery. The Swedish Obese Subject (SOS) study (Karlsson, Sjostrom, & Sullivan, 1998) is among the largest and most comprehensive projects examining bariatric surgery outcomes. Compared to a control group of obese patients receiving dietary and exercise treatment, SOS patients undergoing bariatric surgery reported significant decreases in depression and anxiety two years postoperatively, as well as decreases in obesity-related psychosocial impairment.

Despite advances made to date, many still consider bariatric surgery an extreme intervention. Between 5 and 10% of patients who have bariatric surgery experience “acute” complications including hemorrhage, wound infection, and intestinal leakage, and/or long-term complications including malnutrition, hypoglycemia, and emotional disorders (Pories, 2008).

Procedures and Outcomes: Roux-en-Y gastric bypass. The Roux-en-Y configuration of the gastric bypass was developed in the late 1970s (Griffen, Young, & Stevenson, 1977) and remains one of the top two bariatric procedures performed today (Buchwald & Oien, 2009). In this configuration, formation of a gastric pouch occurs by partitioning off a small, egg-sized section of the stomach. Then, the small intestine is re-routed to form a "Roux limb," which is connected directly to the gastric pouch. The Roux-en-Y bypass is a procedure that is both restrictive (limits the amount of food consumed) and malabsorptive (alters digestive processes). This operation induces equivalent weight loss to earlier gastric bypass procedures, but with reduced risk of complications (Mechanick et al., 2009).

Thirty-day mortality rates for the gastric bypass average 0.14% (ASMBS, 2012), and those who undergo laparoscopic procedures (as opposed to traditional "open" surgeries) are five times less likely to die as a result of surgery (Pories, 2008). Compared to open surgeries, laparoscopic bypass procedures are also associated with lower rates of postsurgical complications (e.g., renal failure, venous thromboembolism, intestinal leakage, wound infection), lower hospital costs ($39,570 vs. $45,629), and 1.8 fewer days spent in the hospital (Masoomi, Nguyen, Stamos, & Smith, 2012). Risk factors for 30-day mortality in gastric bypass patients include higher initial BMI, older age, male gender, and premorbid diagnoses of pulmonary hypertension, congestive heart failure, and liver disease (Benotti et al., 2014).

Perioperative complication rates for the Roux-en-Y bypass are also relatively low at 9% (Tice, Karliner, Walsh, Peterson, & Feldman, 2008). Even extremely high BMI, once considered a contraindication for surgery, appears to be an outdated concern. Comparisons between the super-super obese (BMI ≥ 60) and those with lower body masses showed no statistically significant differences in rates of complications, hernia, or postoperative gallbladder disease (Taylor, Leitman, Hon, Horowitz, & Panagopoulos, 2006).

Although weight loss is dependent on several factors, including adherence to the bariatric lifestyle (e.g., exercise, multiple small meals, avoidance of sugary or fatty foods), the gastric bypass generally leads to significant weight loss. A meta-analysis found that individuals undergoing laparoscopic bypass procedures experienced an average of 61.5% excess weight loss (EWL) one year after surgery, 69.7% two years later, and 71.2% three years later (Garb, Welch, Zagarins, Kuhn, & Romanelli, 2009).

Vertical sleeve gastrectomy. Although a relatively newer procedure, the vertical sleeve gastrectomy is another type of bariatric surgery that has grown in popularity (Saber et al., 2008) and now accounts for more than 50% of all bariatric procedures performed (ASMBS, 2016). On October 1, 2012, the Centers for Medicare and Medicaid Services (CMS) issued a decision memorandum authorizing the procedure on a case-by-case basis, which may have further increased the number of sleeve gastrectomies performed in the U.S. and continues to do so (CMS, 2012). The sleeve gastrectomy, which is a restrictive procedure, involves the surgical removal of approximately 80% of the stomach, leaving a narrow, sleeve-like gastric tube.

Long-term outcome data on the sleeve gastrectomy is limited, but findings appear promising. The sleeve gastrectomy has a 30-day mortality rate of 0.08% (ASMBS, 2012), and EWL averages 67.4% after two years and 58.3% after five years (van Rutte, Smulders, de Zoete, & Nienhuijs, 2014). In a case-controlled study matching participants by age, BMI, and gender, those undergoing sleeve gastrectomy procedures had shorter operative times and hospital stays, comparable EWL, and comparable rates of diabetes remission compared to gastric bypass patients (Boza et al., 2012). Compared to the gastric band, patients with the gastric sleeve report greater improvements in QOL and more overall satisfaction (Alley et al., 2012). Some bariatric surgeons have advocated for the sleeve gastrectomy to replace the gastric bypass as the "gold standard" for bariatric surgery due to its greater tolerability and lower rate of malabsorptive side effects (Buwen, Kammerer, Beekley, & Tichansky, 2015). However, a drawback unique to the sleeve gastrectomy is the development of gastroesophageal reflux disease: as many as 30.9% of gastric sleeve patients develop reflux after surgery (Bohdjalian et al., 2010).

Adjustable gastric band. In recent decades, the adjustable gastric band was developed as a less invasive, reversible alternative to the gastric bypass (Saber et al., 2008). In these procedures, an adjustable band is wrapped around the stomach and inflated with a saline solution via laparoscopic surgery, thereby constricting the stomach and reducing overall food intake. The band can be adjusted by adding or removing saline through a subcutaneous port in the abdomen. Unlike the gastric bypass, the band is a purely restrictive procedure and does not involve a malabsorptive component. Perioperative complication rates for the gastric band are approximately 5% (Tice et al., 2008), and 30-day mortality rates average 0.03% (ASMBS, 2012).

The band is associated with positive weight loss outcomes, with average EWL of 42.6% after one year, 50.3% after two years, and 55.2% after three years (Garb et al., 2009). However, newer studies have demonstrated more modest results, with an average one-year EWL of 37% (Coleman et al., 2014), and long-term (12+ years) EWL of 48% (Himpens et al., 2011). In 2008, the band was the most popular bariatric procedure performed in the U.S. and Canada, accounting for 42.3% of all surgeries (Buchwald & Oien, 2009).

However, the gastric band has rapidly fallen out of favor due to concerns about its efficacy and long-term complications, and in 2015, gastric bands accounted for only 5.7% of all bariatric surgeries performed in the U.S. (ASMBS, 2016). While 80% of gastric bypass patients reported feeling “very satisfied” with the procedure at follow-up, only 46% of gastric band patients reported the same level of satisfaction, and another 19% expressed dissatisfaction or regret about having the surgery (Tice et al., 2008). The gastric band is also associated with unique complications including band erosion and slippage, which often necessitate reoperation (Himpens et al., 2011). Himpens et al. (2011) found that nearly half of gastric band patients required band removal within 12 years, and 59.8% of patients required at least one reoperation for postsurgical complications (e.g., band slippage, disconnection of port tubing). In addition, stomach scarring caused by the gastric band may increase the risk of complication during reoperation (Worni et al., 2013).

Gastric band patients are also susceptible to surgical failure. In addition to the risk of reoperation, described above, many of these patients fail to achieve or maintain substantial weight loss. A 10-year study by Suter, Calmes, Paroz, and Giusti (2006) found that 13.2% of gastric band patients experienced failure after 18 months. By 7 years, this proportion rose to 36.9%. A similar study by Spivak, Abdelmelek, Beltran, Ng, and Kitahama (2012) found that within 10 years of surgery, more than half (51.1%) of gastric band patients either failed to achieve adequate weight loss or required band removal.

Financial Considerations. The financial cost of bariatric surgery presents a significant obstacle for many patients. Average surgical costs in the U.S. range from $15,000 to $25,000 (National Institute of Diabetes and Digestive and Kidney Diseases, 2016), uncomplicated laparoscopic gastric bypass procedures range from $20,000 and $25,000 (Mosti, Dominguez, & Herrera, 2007), and Medicare 30-day reimbursement rates average $19,746 (Flum et al., 2011).

However, perioperative or postoperative complications—including readmissions—can inflate these costs substantially (Mosti et al., 2007).

Coverage for bariatric surgery varies between insurance providers, and many insurers that do pay for surgery view it as a last resort. Although the comorbidities of extreme obesity can be costly, employer-sponsored healthcare plans may take five to 10 years to "break even" with the up-front costs of surgery (Finkelstein & Brown, 2010). Given these expenses, insurance companies often require lengthy waiting periods and evidence that multiple non-surgical weight loss treatments have failed in the past.

These limitations and financial constraints may contribute to the relative underutilization of bariatric surgery. A survey of primary care physicians found that 53% believed most of their patients could not afford bariatric surgery (Tork et al., 2015). Similarly, a survey of morbidly obese patients meeting criteria for bariatric surgery found that 27% indicated that they were not pursuing surgery due to belief that it would not be covered by their insurance (Afonso et al., 2010). Socioeconomic disparities among the obese may further impede access to surgery. Although surgery-eligible individuals (i.e., the morbidly obese) are more likely to be nonwhite and have lower education levels and household incomes, those who ultimately pursue bariatric surgery are more likely to be Caucasian, privately-insured, and have higher incomes (Martin, Beekley, Kjorstad, & Sebesta, 2010).

Surgical Successes. Despite generally positive outcome findings, surgical outcomes can vary greatly between patients, and much remains unknown about the predictors of long-term success. A study of 4,776 postsurgical patients found that extremely high BMIs (>70.0), an inability to walk 200 feet, the presence of obstructive sleep apnea, and a history of deep-vein thrombosis were associated with complications or death within 30 days of surgery (Longitudinal Assessment of Bariatric Surgery [LABS] Consortium, 2009).

Men currently comprise approximately 20% of bariatric surgery patients, and many studies suggest that men face higher morbidity and mortality rates when undergoing bariatric procedures (Livingston et al., 2002; Young, Phelan, & Nguyen, 2016). In a review of bariatric surgical outcomes from 2002-2011, male patients were found to have more frequent and severe medical comorbidities before undergoing bariatric surgery, as well as higher rates of serious morbidity, in-hospital mortality, and hospital length of stay (Young et al., 2016).

Researchers have also examined the prognostic role of age in bariatric surgery outcomes. Livingston et al. (2002) found increased age to be a predictor of operative mortality, with patients over 55 three times more likely to die from surgery. Weight loss outcomes may also be affected by age, with gastric bypass and gastric sleeve patients under 45 typically experiencing greater EWL than patients older than 45 (Contreras, Santander, Court, & Bravo, 2013), and patients under 35 demonstrating greater weight loss outcomes than any other age group, in spite of their initially-higher BMIs (Scozzari, Passera, Benvenga, Toppino, & Morino, 2012).

Some studies have examined the influence of psychological, socioeconomic and demographic variables. Personality disorders are associated with poorer weight loss outcomes (Livhits et al., 2012), while binge eating behavior is associated with higher levels of hunger, more frequent disinhibited eating, and lower levels of social functioning both before and after surgery (Green, Dymek-Valentine, Pytluk, le Grange, & Alverdy 2004). Compared to single patients, married patients experience failure rates more than twice as high (22.3% vs. 10.1%), as well as poorer overall weight loss (Lufti, Torquati, Sekhar, & Richards, 2006). Race may also be a contributor to outcomes. Some studies have found that Caucasian patients lose more weight in comparison to African American patients, even when controlling for initial BMI (Harvin, DeLegge, & Garrow, 2008) and income (Latner, Wetzler, Goodman, & Glinski, 2004).

Although controversial, preoperative weight loss has been another area of interest in bariatric surgery research. In the past, requiring mandatory weight loss prior to surgery was viewed as unfair and futile, given the intractable obesity that leads patients to pursue bariatric procedures in the first place (Tarnoff, Kaplan, & Shikora, 2008). However, recent studies have associated preoperative weight loss with a number of positive outcomes, including shorter operation times (Alami et al., 2007), reduced risk of major complications (Benotti et al., 2009), and postoperative weight loss (Alami et al., 2007; Livhits et al., 2012), even among patients with a BMI > 50.0 at surgery (Still et al., 2007). Patients who engage in preoperative weight loss appear to maintain better weight loss three and four years out of surgery (Solomon, Liu, Alami, Morton, & Curet, 2009). However, there do not appear to be significant differences on these outcomes between non-preoperative weight loss patients and those who lost less than 5% EWL before surgery (Solomon et al., 2009), and even preoperative weight *gain* did not appear to be associated with short-term (i.e., <1 year) weight loss outcomes (Cayci et al., in press).

Surgical Failures. In spite of researchers' attempts to identify predictors of successful outcomes, a considerable proportion of bariatric patients experience surgical failure. Surgical failure is generally defined as the failure to achieve or maintain adequate weight loss, whether defined by BMI or expected EWL. A four-year follow-up study by Snyder, Nguyen, Scarbourough, Yu, and Wilson (2009) identified failure rates (defined as <30% EWL) in 5% of gastric bypass patients and 34% of adjustable gastric band patients. An additional 19% of gastric bypass patients and 39% of adjustable gastric band patients achieved suboptimal weight loss (defined as EWL between 30 and 50%). When defining failure more broadly (<50% EWL), 33.2% of gastric bypass patients met failure criteria at a 10-year follow-up (Higa, Ho, Tercero, Yunus, & Boone, 2011).

Initial BMI has also been examined as a contributor to weight loss outcomes in gastric bypass patients. In a long-term follow-up study (*M* = 11.4 years), Christou, Look, and MacLean (2006) found that 20.4% of morbidly obese patients failed to maintain a postoperative BMI below 35.0, and 34.9% of super obese patients failed to maintain a postoperative BMI below 40.0. However, subsequent studies have found considerably lower failure rates, with 18.8% of super obese gastric bypass patients failing surgery after 48 months (Magro et al., 2008).

Given the newness of the gastric sleeve procedure, less knowledge is available about its long-term failure rates. A study by Sanchez-Santos et al. (2009) found a gastric sleeve surgical failure rate of 15%, defined as substantial weight regain within 3 years of surgery. Another study identified a failure rate of just 6.8%, defined as either weight regain or EWL <25% (Felberbauer et al., 2008). A recent prospective study found similar gastric sleeve failure rates of 10.1%, defined as either weight regain or weight loss failure within 2 years (Fahmy et al., in press).

In addition to surgical failure, smaller amounts of weight regain are also common among postsurgical bariatric patients. In a follow-up study of 274 patients, Christou et al. (2006) found that all participants had experienced weight regain after hitting their lowest weight (also known as nadir), which typically occurred around 2 years after surgery. Shorter-term studies have found that approximately 30% of postsurgical patients begin regaining weight within 18-24 months after surgery (Hsu et al., 1998). Magro et al. (2008) found that after reaching nadir at 18 months, patients tended to regain an average of 8% of their body weight by 60 months.

Surgical Motivations and Expectations. Despite the robust literature on postsurgical outcomes, few studies have examined patients' motivations for pursuing bariatric surgery in the first place. Across studies, most patients identify health or medical reasons as their primary motivator for seeking bariatric surgery (Dixon et al., 2009; Kaly et al., 2008; Libeton, Dixon, Laurie, & O'Brien, 2004; Munoz et al., 2008; Strommen et al., 2009; Wee, Jones, Davis, Bourland, & Hamel, 2006). A qualitative study by Roberson, Neil, Pories, and Rose (2016) found that worsening health and decreasing energy levels were the most common "tipping points" motivating patients to proceed with surgery. However, obese individuals electing to pursue bariatric surgery over behavioral weight loss interventions were more likely to report social reluctance (e.g., social discomfort, public embarrassment), familial considerations (e.g., longevity, caring for children), work responsibilities, and physical disability (Strommen et al., 2009).

Although patients are more likely to describe health-related goals as more important than goals related to appearance or social acceptance (Price, Gregory, & Twells, 2013), many patients do identify appearance and self-esteem-related concerns as significant motivating factors for pursuing bariatric surgery. Patients identifying appearance or self-esteem as primary motivators are more likely to be younger and female, with lower initial BMIs, greater depressive symptoms, and poorer self-reported QOL and body image (Dixon et al., 2009; Libeton et al., 2004). Notably, this appearance-related concern may be associated with slightly better postsurgical weight loss outcomes, even after controlling for age and sex (Dixon et al., 2009).

As noted above, bariatric surgery often leads to substantial, lasting weight loss. However, bariatric patients may harbor significantly unrealistic weight loss expectations, and women in particular may report higher expected weight loss (Kaly et al., 2008). Price and colleagues (2013) found that gastric sleeve patients identified "dream," "happy," and "acceptable" EWL goals significantly above clinically-expected EWL (88.7%, 76.4%, and 68.2% vs. 56.1%, respectively). Another study found similarly unrealistic expectations among gastric bypass patients – and, notably, these unrealistic weight loss goals did not shift 6 or 12 months after surgery (White, Masheb, Rothschild, Burke-Martindale, & Grilo, 2007). However, White et al. (2007) found no correlation between patients' expectations and actual weight loss outcomes, nor did they find an impact of unrealistic expectations on measures of depression, global self-esteem, or disordered eating.

Body Contouring. Many bariatric patients lack the skin elasticity to support rapid weight loss, leading to a "deflated" appearance marked by flaps of excess skin around the torso, arms, and legs (Spector, Levine, & Karp, 2006). Eighty-nine percent of patients reported problems with redundant skin after bariatric surgery, and women may be more likely to report problems in a higher number of body areas (Giordano, Victorzon, Koskivuo, & Suominen, 2013). Another study identified even higher rates (95.6%) of dissatisfaction with excess skin following surgery, occurring most frequently on the abdomen, breasts, and thighs (Kitzinger et al., 2012). Apart from the aesthetic unattractiveness of these flaps, excess skin may be itchy and uncomfortable, limit mobility, produce infection or sores between skin folds, and increase strain on the heart. Among postoperative bariatric patients, 9.2% report "high" or "very high" degrees of overall daily impairment due to redundant skin (Giordano et al., 2013). Although most bariatric patients experience concerns with skin folds, those who experience greater weight loss are more likely to report physical discomfort from excess skin (Giordano et al., 2013).

"Body contouring" refers to a set of surgical procedures used to remove excess skin in postsurgical bariatric patients. The trunk region (abdomen and/or hips and buttocks) represents the most common area for intervention, with 91.9% of body contouring patients seeking excess skin removal in this area (Fischer, Wes, Serletti, & Kovach, 2013); breast contouring procedures are performed in 14.1% of patients, and arm/leg contouring in 2.0%. Complications of body contouring procedures include serous fluid collection, wound rupture, blood loss, and hematoma, and these risks appear to increase among individuals with higher BMIs (American Society for Aesthetic Plastic Surgery, 2008). Body contouring is associated with a 6.3% minor complication rate (superficial wound infections or openings), and a 6.8% rate of major complications, including deep wound infections or unplanned returns to the operating room within 30 days (Fischer et al., 2013).

Most insurance companies consider body contouring procedures to be “cosmetic” surgeries and do not cover them. Consequently, body contouring surgery may be inaccessible to those who desire it. Supporting this assumption, Kitzinger et al. (2012) found that in spite of patients’ frequent complaints of excess skin, only 21% of postsurgical bariatric patients had undergone body contouring surgery. Of those who had not undergone body contouring surgery, the majority of patients (75% of women and 68% of men) reported desiring it. Bariatric patients’ desire for body contouring appears to increase with time since bariatric surgery (Steffen et al., 2012) and amount of weight lost (Giordano, Victorzon, Stormi, & Suominen, 2014). Among bariatric patients not pursuing body contouring procedures, over 70% attributed this decision to a lack of perceived necessity, or to concerns with the pain, risk, and recovery time of surgery (Sioka et al., 2015). However, another 25% of patients cited financial concerns or a lack of insurance coverage as their primary reason for not pursuing body contouring. Other studies have found financial barriers to be the most commonly cited reason for not pursuing body contouring procedures (Reiffel et al., 2013).

Despite their “cosmetic” classification, body contouring procedures are associated with positive health outcomes. Abdominoplasty may lead to decreased back pain, increased physical activity, and elimination of fungal skin fold infections among postsurgical bariatric patients (El-Khatib & Bener, 2004). Manahan and Shermak (2006) found that patients undergoing abdominal contouring experienced improvements in ambulation and hygiene secondary to their bariatric surgery. Body contouring surgery has even been associated with postoperative weight loss in obese non-bariatric patients (Wright et al., 2006) and additional weight loss in bariatric patients (Soundararajan, Hart, & Royston, 1995).

In addition to the physical benefits of excess skin removal, body contouring procedures lead to improvements in body image and QOL (e.g., Modarressi, Balague, Huber, Chilcott, & Pittet-Cuenod, 2013; Song et al., 2006). Compared to a control group of bariatric patients not receiving additional surgery, patients undergoing abdominoplasty following bariatric surgery reported significantly higher levels of self-esteem and feelings of attractiveness, as well improvements in mobility and sexual functioning (Stuerz, Piza, Niermann, & Kinzl, 2008). A similar study by de Zwaan et al. (2014) found that bariatric patients undergoing body contouring surgery reported better appearance evaluation, body area satisfaction, and physical functioning.

Modarressi and colleagues (2013) found that 57% of patients who pursued body contouring after gastric bypass surgery reported having a "much better" QOL, versus 22% of patients who underwent gastric bypass surgery alone. Body contouring patients also reported significantly improved self-esteem compared to patients not undergoing additional surgery (85% vs. 48%). Another study found that 93.8% of women who had undergone abdominoplasty following bariatric surgery reported feeling happy with their new figure and silhouette, and 75% indicated that they had begun taking better care of themselves as a result (Cintra et al., 2008).

Although weight loss generally leads to psychosocial improvements, patients who desire body contouring but have not obtained it (due to financial constraints, surgical contraindications, surgery waiting times, etc.) may experience significant distress related to their appearance or QOL. Koller, Schubhart, and Hintringer (2013) found that patients scheduled to undergo body lift procedures experienced intense physical insecurity and feelings of low attractiveness, which were comparable to a control group of patients who had not undergone bariatric surgery (or lost any weight) in the first place.

Compared to a normative cohort, women awaiting body contouring surgery reported greater self-consciousness during sexual activity, and significantly poorer evaluations of their physical appearance (Bolton, Pruzinsky, Cash, & Persing, 2003). After body contouring, however, these women reported greater sexual confidence and increased satisfaction with various body parts, as assessed by the Body Areas Satisfaction Scale (BASS).

Body Image

Body image is a multifaceted construct involving the way one perceives and responds to his or her body and physical appearance. This may include mental images of the body, evaluation of specific body parts, and overall satisfaction or dissatisfaction with one's appearance. In short, body image encompasses any number of thoughts, feelings, and behaviors pertaining to an individual's relationship with his or her body.

Although body image research has traditionally focused on women and girls—particularly in the context of eating disorders—the field has expanded to include the experiences of men and boys, persons with medical illnesses or injuries, and non-clinical populations (Cash, 2004). Studies have also examined specific facets of body image, including evaluation (e.g., satisfaction vs. dissatisfaction with physical characteristics), perception (e.g., accuracy in the self-assessment of shape and weight), and investment (e.g., personal standards and beliefs about the importance of appearance).

Body image is an important component of psychological health, and body image is correlated with self-esteem in both men and women (Davison & McCabe, 2005; Mellor, Fuller-Tyszkiewicz, McCabe, & Ricciardelli, 2010). In general, however, women experience poorer body image than men, and Caucasian women experience worse body image in comparison to African American women (Grabe & Hyde, 2006; Schwartz & Brownell, 2004). Body image may also vary between age groups, with adults in their 30s and 40s reporting lower levels of body satisfaction and greater attempts to conceal their bodies (Davison & McCabe, 2005).

Negative body image is associated with poor psychosocial outcomes in adults, including low self-esteem (Green & Pritchard, 2003), depression (e.g., Nyboe Jacobsen, Smith Lassen, Friis, Videbech, & Wentzer Licht, 2006; Olivardia, Pope, Borowiecki, & Cohane, 2004), and eating disorders (Forman & Davis, 2005; Peat, Peyerl, & Muehlenkamp, 2008). Chronic dieters experience lower appearance evaluation, lower body satisfaction, and more distorted perceptions of body weight than non-dieters (Gingras, Fitzpatrick, & McCargar, 2004).

Stunkard and Mendelson (1967) were among the first to identify a negative relationship between body image and obesity. Decades later, in light of the obesity epidemic, the relationship between obesity and body image has become an area of significant clinical and research interest. Obesity is associated with poorer body image (Dalle Grave et al., 2007; Friedman, Reichmann, Costanzo, & Musante, 2002; Hill & Williams, 1998; Schwartz & Brownell, 2004), and among obese individuals, those seeking weight loss treatment tend to endorse even worse body image (Dalle Grave et al., 2007). Obese individuals experience greater body dissatisfaction than those who are not obese (Matz, Foster, Faith, & Wadden, 2002). A study by Sarwer, Wadden, and Foster (1998) found that compared to normal weight women, more than twice as many obese women felt moderately to extremely dissatisfied with their appearance (68% vs. 33%). Obese women were also significantly more likely, compared to normal weight women, to report avoiding looking at their bodies (23% vs. 7%).

Body dissatisfaction in obese adults appears to be predicted by weight-based teasing (Jackson, Grilo, & Masheb, 2000; Matz et al., 2002), childhood onset of obesity (Jackson et al., 2000), self-esteem, and internalization of sociocultural appearance standards (Matz et al., 2002). The presence of binge eating behaviors has also been associated with body dissatisfaction in obese adults (Sarwer, Thompson, & Cash, 2005). Among obese women presenting for bariatric surgery, nearly half of the variance in body dissatisfaction was accounted for by BMI, Caucasian ethnicity, childhood obesity onset, childhood teasing about weight, binge eating, depression, low self-esteem, shame, and perfectionism (Rosenberger, Henderson, & Grilo, 2006). Depression, low self-esteem, and perfectionism were also independently associated with body image dissatisfaction.

While obesity and weight gain are associated with negative body image outcomes, the reverse also appears to be true. Weight loss is associated with improvements in body image. Foster, Wadden, and Vogt (1997) examined changes in body image among obese women enrolled in a weight loss program. Halfway through treatment, participants endorsed more positive body image as indicated by appearance evaluation and satisfaction with physical characteristics, but small amounts of weight regain over the course of treatment were associated with worsening body image. Dalle Grave and colleagues (2007) found that weight loss itself was associated with increased body satisfaction, regardless of the actual amount of weight lost. Similarly, another study of women enrolled in a weight loss program found that perceived physical changes were even more predictive of improved body image than actual physical changes (Martin Ginis, McEwan, Josse, & Phillips, 2012).

Improvements in body image may positively affect additional outcomes. Among obese women enrolled in a behavioral weight loss program, for example, improvements in self-esteem and body size satisfaction were predictive of long-term weight loss outcomes (Palmeira et al., 2010). Annesi and Marti (2011) found that involvement in an exercise program led to improved body image and feelings of self-efficacy in obese adults, which in turn predicted weight loss.

Recent literature has also found weight loss surgery to significantly improve body image among obese adults (e.g., De Panfillis et al., 2007; Dixon, Dixon, & O'Brien, 2002; Hrabosky et al., 2006; Neven et al., 2002; Pecori, Serra Cervetti, Marinari, Migliori, & Adami, 2007; Sarwer et al., 2010). Compared to a control population of morbidly obese individuals, post-surgical bariatric patients experienced less body image discomfort (Pecori et al., 2007). A cross-sectional study by Neven and colleagues (2002) investigated body image with the Multidimensional Body-Self Relations Questionnaire (MBSRQ) at four different time points: pre-surgery, 1 to 3 weeks after surgery, 6 months after surgery, and 12 months after surgery. An ANOVA found differences in body image across the four time points, with the most significant difference occurring between pre-surgery and 6 months. A smaller, but still significant, difference occurred between 6 and 12 months. Hrabosky et al. (2006) also identified significant changes in postoperative body satisfaction, with 83% reporting improvements in body satisfaction after 6 months and 85% reporting improvements after 12 months.

In a longitudinal study of bariatric patients, Dixon et al. (2002) found significant improvements in patients' appearance evaluation 12 months after surgery, and these improvements maintained out to 4 years. Body image outcomes were also related to EWL, with greater weight loss being associated with higher appearance evaluation. Sarwer et al. (2010) also found a correlation between EWL and better body image.

However, it should be noted that not all individuals experience improvements in body image and self-esteem after losing weight. The excess skin following rapid weight loss often necessitates body contouring surgery, as described above. Bariatric patients with psychological risk factors (e.g., elevations on MMPI-2-RF demoralization and low positive emotions scales, preoperative diagnoses of depression) were more likely to report body image concerns three months after surgery (Pona, Heinberg, Lavery, Ben-Porath, & Merrell Rish, 2016). In addition, Cash, Counts, and Huffine (1990) found that formerly overweight women experienced poorer body image, viewed their bodies as fatter, and endorsed more weight-based anxieties than women who had never been overweight. A similar study found that formerly overweight women more closely resembled currently overweight (versus never overweight) women on measures of weight preoccupation and dysfunctional appearance investment (Annis, Cash, & Hrabosky, 2004). Cash and colleagues (1990) coined the term "phantom fat" to describe this phenomenon. In other words, an individual weighing 175 pounds after losing a significant amount of weight will have different body image experiences than another individual weighing 175 pounds naturally. However, literature examining the "phantom fat" phenomenon is extremely limited.

Quality of Life

Quality of life (QOL) is a broad construct that refers to any number of environmental, social, and subjective factors that contribute to overall well-being (Diener & Suh, 1997). In psychology, QOL research tends to focus on subjective experiences across biopsychosocial domains. Health-related QOL (HRQOL), which examines an array of physical and psychological factors, is an area of QOL research with a considerable research base.

Some researchers have examined the predictive factors contributing to QOL among the obese, including gender, race, BMI, and comorbid conditions. Obesity is generally associated with lower HRQOL (e.g., medical comorbidities, impaired mobility and physical functioning) and psychosocial QOL (e.g., self-esteem, social interactions, sexual functioning). However, differences appear to exist among obese individuals seeking weight loss surgery versus obese individuals not seeking treatment (Kolotkin et al., 2003). Kolotkin et al. (2003) found that QOL was significantly worse in treatment-seekers, even when controlling for BMI, age, and gender. The deficits in QOL among treatment-seekers were exacerbated by the presence of medical comorbidities in certain domains (e.g., physical functioning and sexual life), but not others (e.g., occupational functioning). However, the authors found that most of the variance in QOL was attributable to treatment-seeking status, high BMI, female gender, and the presence of comorbid depression.

A longitudinal study by Kolotkin, Crosby, Gress, Hunt, and Adams (2009) examined the differences in QOL between postsurgical bariatric patients, a group of obese individuals who sought but did not undergo weight loss surgery, and a control group of obese individuals who did not seek out surgical treatment. Over a two-year period, the surgical group lost significantly more weight, and 97% of the postsurgical patients experienced improved QOL (versus 43% for the surgery seekers and 30% for the control group). A similar study identified significant QOL improvement among postsurgical bariatric patients six years out of surgery versus two comparison groups of obese individuals who did not undergo bariatric surgery (Kolotkin, Davidson, Crosby, Hunt, & Adams, 2012).

White, O'Neil, Kolotkin, and Byrne (2004) administered the Impact of Weight on Quality of Life-Lite Questionnaire (IWQOL-Lite; Kolotkin et al., 2001) to obese adults seeking bariatric surgery and found that all participants reported an impact of their weight on their QOL. Treatment-seeking participants reported the lowest QOL in the areas of physical functioning (e.g., difficulty with mobility), public distress (e.g., experiencing ridicule or unwanted attention), and self-esteem (e.g., not liking self).

Interestingly, White et al. (2004) found that although Caucasian women had lower BMIs on average than African American women, Caucasian men, or African American men, they endorsed the lowest QOL all domains. Additionally, women of both races endorsed a significantly greater impact of weight on their sexual lives in comparison to men of both races. Although the racial differences among women warrant further consideration, these findings nonetheless suggest that obese women as a group experience greater disturbances in their QOL when compared to men.

As with body image, QOL appears to be susceptible to fluctuation based on changes in weight. Among overweight and obese women with urinary incontinence, weight loss at 6 and 18 months—but not decreases in urinary incontinence—was associated with improvements in HRQOL (Pinto et al., 2012).

The relationship between QOL and weight loss through bariatric surgery is particularly robust (e.g., Boan, Kolotkin, Westman, McMahon, & Grant, 2004; Dymek, le Grange, Neven, & Alverdy, 2002; Engel et al., 2003; Hell, Miller, Moorehead, & Samuels, 2000; Kolotkin, Zunker, & Ostbye, 2012; Mamplekou, Komesidou, Bissias, Papakonstantinou, & Melissas, 2005; Nickel et al., in press; Sarwer et al., 2010). Hell et al. (2000) found that 75% of individuals who had undergone bariatric surgery showed an increased QOL in comparison to a control group of morbidly obese individuals. Engel et al. (2003) found that weight loss in overweight and obese adults correlated with improvements in HRQOL. However, the reverse correlation was also supported. When the same participants regained the weight lost, they reported diminished HRQOL.

A cross-sectional analysis by Dymek et al. (2002) examined differences between IWQOL-Lite domains at various stages in the bariatric surgical process (pre-surgery [T1], several weeks after surgery [T2], 6 months after surgery [T3], and 12 months after surgery [T4]). The first changes in QOL occurred within weeks after surgery, with participants reporting improvements in physical QOL between T1 and T2. Global increases in QOL occurred between T2 and T3, with all IWQOL-Lite subscales increasing significantly. Between T3 and T4, participants endorsed additional improvements in the physical, self-esteem, and public distress subscales of the IWQOL-Lite, but significant differences were not observed in the areas of sexual functioning or work life (Dymek et al., 2002).

Body Image Quality of Life

Given the association between body image and psychosocial outcomes, it seems reasonable to assert that body image may also influence one's quality of life. This construct, called body image quality of life (BIQOL), refers to the positive or negative effects of one's body image on various domains of functioning (e.g., interpersonal relationships, health, self-efficacy, and confidence). Although research on BIQOL is limited, the literature has nonetheless identified some interesting findings.

Cash and Fleming (2002) found a significant negative relationship between BMI and BIQOL: Women with higher BMIs tended to report lower BIQOL, even after controlling for their level of body satisfaction. Women seeking bariatric surgery reported significantly poorer BIQOL than the normative sample, although a linear relationship between BIQOL and BMI was not identified (Ghai, Milosevic, Laliberte, Taylor, & McCabe, 2014). Rusticus, Hubley, and Zumbo (2008) examined the effect of age and gender on BIQOL and found that men experienced more positive BIQOL than women. They also found that older adults (55+ years) experienced better BIQOL than young adults (18-29 years), and both older and young adults experienced better BIQOL than middle-aged adults (30-54 years).

Lobera and Rios (2011) assessed for BIQOL among three groups: an eating disorder clinical sample, a non-eating disorder clinical sample, and a nonclinical control sample. They found that the eating disorder group endorsed significantly worse BIQOL than either of the other samples. Among participants in the eating disorder sample, men endorsed worse BIQOL than women.

Heron, Mason, Sutton, and Myers (2015) found that college women with higher BIQOL reported fewer symptoms of depression, perceived stress, and concerns with body shape. When asked to track their life experiences in vivo using palmtop computers, these women reported less negative affect, more positive affect, more pleasant social interactions, and greater perceived self-efficacy.

Although BIQOL research in bariatric populations is highly limited, a repeat-measures study by Sarwer et al. (2010) did demonstrate significant improvement in patients' postoperative BIQOL. Improvements were observed from 4 weeks before surgery to 20 weeks after surgery, with additional improvements in weeks 40 and 92.

Study Purpose

This study sought to expand upon existing research on the psychosocial outcomes of bariatric surgery. Particular emphasis was placed on body image and QOL due to the known relationship between obesity, weight loss, bariatric surgery, and these domains. As an intermediary construct between body image and QOL, it was assumed that BIQOL might demonstrate similar changes after bariatric surgery. However, only one known study to date has examined BIQOL within the postoperative bariatric population.

Within the field of bariatric research, body contouring has been an additional area of growing interest. Although current research suggests that most patients experience problems with excess skin after bariatric surgery, body contouring surgery remains underutilized and financially inaccessible to many who desire it. This study sought to examine the impact of financial barriers on bariatric patients' desire and intent to pursue body contouring surgery. Furthermore, this study sought to examine the relationship between body dissatisfaction and desire for contouring surgery, which the literature has not yet addressed.

Finally, this study intended to build upon a largely unstudied aspect of bariatric surgery: patients' motivations. While few studies have examined patients' self-reported motivations for pursuing bariatric surgery, even fewer have examined the relationship between presurgical motivations and postsurgical weight loss outcomes. This study sought to examine patients' reasons for undergoing weight loss surgery, as well as identifying whether these reasons were associated with body dissatisfaction or weight loss outcomes.

Hypotheses

Hypothesis 1: Psychosocial Outcomes. The first prediction was that time since surgery, total weight loss, and EWL would be positively correlated with improvements in body image, quality of life, and body image quality of life. Due to different starting weights and the variability of weight loss outcomes among participants, EWL was predicted to demonstrate stronger predictive validity than time since surgery or total weight loss.

Hypothesis 2: Body Contouring and Body Satisfaction. It was predicted that patients reporting lower scores on a measure of body dissatisfaction would report higher levels of interest in pursuing body contouring surgery. Due to the prevalence of redundant abdominal skin after bariatric surgery, it was also predicted that patients reporting lower scores on a measure of abdominal dissatisfaction would report higher levels of interest in pursuing body contouring surgery.

Hypothesis 3: Body Contouring and Finances. It was predicted that patients would be more likely to consider and express interest in pursuing body contouring surgery when finances/insurance coverage are not a barrier.

Hypothesis 4: Presurgical Motivations and Correlates. The last prediction was that patients' self-reported presurgical motivations would predict postsurgical outcomes. Specifically, it was predicted that patients citing appearance as a primary motivator for pursuing bariatric surgery would demonstrate lower scores on body image, body image quality of life, and body area satisfaction questionnaires. It was also predicted that patients citing specific motivations (appearance-related, health-related, or relationship-related) would demonstrate a higher EWL than patients not citing these motivations.

CHAPTER II

Method

Participants

Participants in this study were 79 postsurgical bariatric patients enrolled in a bariatric program in Southeastern Virginia. Sample size was determined through an *a priori* power analysis using the computer program G*Power, v.3.1.9.2, using an alpha value of .05, a power value of .80, and a partial f^2 effect size of .15. Participants were recruited during their routine postsurgical visits, which occurred approximately 1, 3, 6, and 12 months after surgery.

Exclusionary Criteria. Participants under 18 or over 65 years of age were excluded from this study, as were patients unable to read and write in English and patients who had previously completed this study. Furthermore, patients who had undergone adjustable gastric band surgery were excluded from participation. The reasons for this exclusion were twofold. First, literature has demonstrated significantly poorer surgical and weight loss outcomes among adjustable gastric band patients, as described earlier. Second, the adjustable gastric band procedure has rapidly fallen out of favor in recent years; subsequently, the bariatric surgical center where this study took place rarely performs the procedure.

Measures

Demographics. Participants completing the study received instructions to provide demographic information including age, sex, and marital status. Erroneously, race/ethnicity and level of education had been omitted from the demographics questionnaire, and this data was therefore unavailable for analysis.

Participants were also asked to provide their height (in feet and inches), current weight, highest weight before pursuing surgery, and goal weight (as identified by their surgeon). All weight measurements were provided in pounds. An online BMI calculator (National Heart, Lung, and Blood Institute, n.d.) was used to calculate each participant's current BMI. The calculation used to determine total weight lost followed the formula: Highest Weight – Current Weight. EWL was calculated for each participant using the following formula: (Total weight lost ÷ [Highest Weight – Goal Weight]) x 100. Participants were also asked to identify the type of surgery they underwent (i.e., gastric sleeve or gastric bypass), as well as the type of postoperative appointment they were attending (i.e., 1, 3, 6, or 12-month follow-up).

Motivation for pursuing surgery. Surgical motivation was assessed via an open-ended narrative question: "Every patient has his or her own reasons for wanting to pursue weight loss surgery. What were your motivations for pursuing this treatment? Please try to limit your response to two or three sentences." The number of permissible responses was not limited. Later, responses were reviewed and content-coded by the researcher using directed content analysis (Hsieh & Shannon, 2005). Directed content analysis is described by Hsieh and Shannon (2005) as the utilization of both preexisting theory/relevant research and an inductive approach to data analysis. By allowing themes to "emerge" from qualitative data, directed content analysis is often used to validate or expand upon existing conceptual frameworks (Hashemnezhad, 2015). In addition to testing the above hypotheses, a descriptive table of responses (i.e., number and frequency of various motivations) was generated.

Consideration of body contouring. Participants were asked to identify their likelihood of considering and/or pursuing body contouring surgery across two conditions: current and hypothetical. Current consideration/intent to pursue was assessed with the following questions: "Currently, how likely are you to consider body contouring surgery?" and "Currently, how likely are you to actually pursue body contouring surgery?" Responses were measured with a 5-point

Likert type scale ranging from 1 (*Will definitely not consider/pursue*) to 5 (*Will definitely consider/pursue*).

Hypothetical consideration/desire to pursue was assessed with the following questions: "If finances/insurance coverage were no issue, how likely would you be to consider body contouring surgery?" and "If finances/insurance coverage were no issue, how likely would you be to actually pursue body contouring surgery?" Responses were measured with a 5-point Likert type scale ranging from 1 (*Would definitely not consider/pursue*) to 5 (*Would definitely consider/pursue*).

Body image. Body image was assessed with the Multidimensional Body-Self Relations Questionnaire (MBSRQ; Cash, 2000). The MBSRQ is a 69-item self-report measure designed to assess body image in teenagers and adults (15+ years) across ten scales. Seven of these scales were identified via confirmatory factor analysis using scree test criteria (Brown, Cash, & Mikulka, 1990) and include self-evaluation and behavioral assessment of appearance, fitness, and health, as well as overall preoccupation with illness. The MBSRQ also contains three multi-item scales: The Body Areas Satisfaction Scale (BASS) measures dissatisfaction or satisfaction with various aspects of appearance (e.g., mid torso, muscle tone); the Overweight Preoccupation Scale measures present eating restraint and anxiety/vigilance about weight; the Self-Classified Weight Scale contains a self-report of weight status ranging from 1 (*very underweight*) to 5 (*very overweight*). The BASS is answered on a 5-point Likert type scale ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*). All other items on the MBSRQ are answered on a 5-point Likert type scale ranging from 1 (*definitely disagree*) to 5 (*definitely agree*), and scores are derived by calculating the mean of all items on a subscale. Higher scores on all subscales of the MBSRQ (including the BASS) are reflective of more positive body image.

Because the MBSRQ does not yield a single global score, only the 7-item Appearance Evaluation (AE) subscale and the 9-item BASS were analyzed for the purposes of this study. The AE subscale was chosen because of its direct relevance to satisfaction/dissatisfaction with one's appearance (e.g., "I like my looks just the way they are," and "I am physically unattractive"). Previous studies have also utilized the isolated AE subscale of the MBSRQ (e.g., Bolton et al., 2003; Ghai et al., 2014). The BASS was also chosen for analysis as it provides valuable insight into the specific aspects of appearance that are most distressing to bariatric patients. One particularly important BASS item directly assesses participants' satisfaction or dissatisfaction with their "mid torso (waist, stomach)," which has been shown to be the most commonly-reported "problem area" in postsurgical bariatric patients. The BASS has also been used to examine body image among postsurgical bariatric patients (see Bolton et al., 2003).

In addition to the utility of its subscales, the MBSRQ was chosen for several reasons. The MBSRQ can be quickly administered and is suitable for use with both women and men (Cash, 2000). In addition, the test demonstrates strong internal consistency for scales (Cronbach's alpha = .70 to .91) and test-retest reliability (r = .71 to .94; Cash, 2000). It also demonstrates strong construct validity, as evidenced by confirmatory factor analysis (e.g., Brown et al., 1990) and factorial invariance among African American and Caucasian women (Kelly et al., 2012).

Quality of life. Quality of life (QOL) was assessed with the Impact of Weight on Quality of Life-Lite scale (IWQOL-Lite; Kolotkin & Crosby, 2002). The IWQOL-Lite scale is a self-report measure with 31 items that can be used to assess the impact of weight on QOL among five domains. These domains are Physical Functioning (e.g., difficulty using stairs, 11 items), Self-Esteem (e.g., avoiding looking in mirrors, 7 items), Sexual Life (e.g., avoiding sexual activity, 4 items), Public Distress (e.g., fear of embarrassment in public, 5 items), and Work (e.g., failure to receive appropriate recognition at work, 4 items). The IWQOL-Lite was adapted from an earlier, 74-item edition of the instrument and has a .97 correlation with this earlier version (Kolotkin, Crosby, Kosloski, & Williams, 2001). All items start with the phrase "Because of my weight…" and require participants to report their level of impairment on a 5-point Likert type scale, with lower ratings being indicative of less impairment. The IWQOL-Lite yields a global score (out of 155 points) as well as subscale scores, with higher scores indicative of poorer QOL.

The IWQOL-Lite was chosen largely due to its excellent psychometric properties and extensive usage in the literature. Kolotkin et al. (2001) found that Cronbach's alpha coefficients for the subscales range from .90 (Work) to .94 (Physical Functioning), with an overall alpha coefficient of .96. Construct validity has also been demonstrated by the IWQOL-Lite's sensitivity to changes in weight. The IWQOL-Lite has demonstrated sensitivity to treatment seeking status, degree of obesity, and changes in weight status (Kolotkin & Crosby, 2002). In a within-subjects study, Kolotkin et al. (2001) found that individuals who reported modest weight loss also reported improved QOL, both globally and within four out of five domains (excluding Work). The IWQOL-Lite also shows excellent convergent validity with items used to assess for obesity-related impairment by the International Classification of Functioning, Disability and Health (ICF; Tessier, Mayo, & Cieza, 2011). Due to this convergent validity, Tessier et al. (2011) suggest that the IWQOL-Lite may be especially appropriate for use in medical settings.

Body image quality of life. Body image quality of life (BIQOL) was assessed with the Body Image Quality of Life Inventory (BIQLI; Cash & Fleming, 2002). The BIQLI is a 19-item self-report instrument which assesses the positive and negative impact of one's body image across psychosocial domains, including "relationships with friends," "day-to-day emotions," and "ability to control my weight." The instrument, which was developed for use with late adolescents and adults, requires participants to estimate the impact of their body image in each area with a 7-point Likert type scale ranging from -3 (*very negative effect*) to 3 (*very positive effect*). The BIQLI yields a single composite score, calculated by determining the mean score of all 19 items. Higher BIQLI composite scores reflect greater BIQOL.

The BIQLI was selected in part due to its psychometric properties: The test demonstrates scalar invariance (Rusticus et al., 2008), as well as strong internal consistency (Cronbach's alpha = .95), good test-retest reliability over 2 to 3 weeks (.79), and strong convergent validity with existing measures of body image and appearance preoccupation (Cash & Fleming, 2002). A follow-up study by Heron et al. (2015) demonstrated similar test-retest reliability (.77) over a 1-week period. To date, the BIQLI is also the only empirically validated measure of BIQOL.

Although the BIQLI was developed on a normative sample of college women, subsequent studies demonstrated the test's suitability for use with college men (Cash & Grasso, 2005; Cash, Jakatdar, & Williams, 2004) and adults (men and women) ranging in age from 18 to 89 (Rusticus et al., 2008). Only one study to date appears to have utilized the BIQLI in a postsurgical bariatric population (Sarwer et al., 2010).

Design and Procedure

This study used a cross-sectional survey design to investigate a variety of postsurgical outcomes (e.g., weight loss, quality of life, body dissatisfaction, interest in body contouring surgery) and presurgical motivations in bariatric patients between 1 and 12 months post-bariatric surgery. Responses were obtained via an anonymous, computer-based survey, which participants completed following their scheduled postoperative visits.

Institutional Review Board (IRB) approval was obtained through the Eastern Virginia Medical School (IRB# 14-04-XX-0065S) on September 8, 2014. This study qualified for exempt status per IRB standards and, thus, did not require signed consent forms to be obtained from participants.

Participants were recruited during routine postsurgical visits to a bariatric surgical practice in Southeastern Virginia. Although patients typically attend many postsurgical appointments (from 1-2 weeks to 2+ years postoperatively), this study only included participants attending 1-month, 3-month, 6-month, or 12-month follow-up appointments. These time points were chosen for three reasons. First, this study sought to examine early postoperative outcomes, as the literature demonstrates that the first postoperative year is associated with marked weight loss and psychosocial improvement. Second, follow-up attrition is highly prevalent within the postoperative bariatric population (e.g., Khorgami, Zhang, Messiah, & de la Cruz-Munoz, 2015), thus limiting opportunities to recruit participants at postoperative times greater than 12 months. Finally, an earlier version of a similar type of study sought to compare outcomes between patients at specific time points, and the 1, 3, 6, and 12 month points were chosen to capture a range of early postsurgical time points.

As a routine check-in procedure, front desk administrative staff identified which type of appointment patients were attending (e.g., presurgical, sick visit, postsurgical follow-up). Patients identified as attending 1-month, 3-month, 6-month, or 12-month follow-up appointments were invited to participate in the study by either an administrative staff member or a member of the research team. Patients attending 1-month, 3-month, 6-month, or 12-month follow-ups were also provided with an informational flyer about the study (e.g., study purpose, risks and benefits). Treatment providers (nurses, nurse practitioner, and two bariatric surgeons) were also asked to encourage patients attending 1-month, 3-month, 6-month, or 12-month appointments to participate in the study.

After completion of their follow-up appointments, interested participants were escorted to a computer terminal located inside the office by a member of the clinical staff or research team. All demographic questions and questionnaires were administered via a computerized survey (SurveyMonkey). IP addresses used to access this survey were not collected, as participants only used one of two office computers to complete the study. These computers were maintained in accordance with hospital IT security standards. SSL encryption was also utilized for additional privacy protection. The SurveyMonkey account was password-protected, and only the researcher had access to this account and the study data.

Upon launching the survey, participants responded to three preliminary yes/no questions to determine eligibility. Participants who indicated they were under 18 years old, over 65 years old, or had ever undergone Lap band surgery were excluded from the study and immediately redirected to a disqualification page. Participants meeting criteria were directed to complete the remainder of the survey, which was comprised of the questionnaires and instruments previously described.

Statistical Analysis

Data were analyzed using IBM *SPSS Statistics* v.24 for Macintosh. Consistent with similar studies in the field of bariatric research, power for all analyses was set at .80, and the p value for interpreting significant values was $< .05$.

Hypothesis 1 was tested with a hierarchical multiple regression to determine if the addition of time since surgery, total weight loss, and EWL improved the prediction of IWQOL-Lite, MBSRQ-AE, and/or BIQLI scores over and above demographic variables (age, sex, marital status, type of surgery) alone.

Hypothesis 2 was tested with a linear regression to determine if body dissatisfaction (as assessed by BASS scores or BASS-Abdomen scores) predicted interest in/intent to pursue body contouring surgery.

Hypothesis 3 was tested with a paired-samples t-test to determine whether there was a statistically significant mean difference in participants' current consideration of body contouring surgery vs. consideration of surgery if financial coverage were available.

Hypothesis 4 was tested using a series of independent-samples t-tests to determine whether participants citing specific motivations differed from participants not citing these those motivations on outcome measures (e.g. MBSRQ-AE, EWL).

CHAPTER III

Results

Excluded Participants

Of 103 total respondents, 24 (23.3%) were excluded from final analysis. Among these participants, reasons for exclusion included: under 18 or over 65 years of age (70.83%), presurgical status (i.e., attending preoperative psychology or diagnostic appointment; 12.5%), and early discontinuation of the survey (16.67%). In total, data from 79 participants were analyzed.

Demographics

The majority of participants (83.3%) were female. This is consistent with the national proportion of female to male patients undergoing bariatric surgery per Fuchs et al. (2015), as well as with the typical patient population seen at the surgical center (S. Wohlgemuth, personal communication, September 9, 2016). Average age was 44.39 years (*SD* = 10.95 years). The majority of participants (67.1%) were married; 13.9% were single; 10.1% were divorced or separated; 6.3% were partnered; and 2.5% were widowed. Appointment types were not evenly proportioned: 20.3% of respondents attended a 1-month appointment; 22.8% attended a 3-month appointment; 35.4% attended a 6-month appointment; and 21.5% attended a 12-month appointment. A disproportionate percentage of gastric bypass patients (69.3%) attended 6-month or 12-month appointments, versus 54.6% of gastric sleeve patients. A significant majority of patients (83.5%) reported undergoing a vertical sleeve gastrectomy, with gastric bypass procedures representing only 16.5% of the surgeries performed. Surgical staff confirmed that this was a representative proportion of surgeries performed at this clinic during the timeframe of the study (S. Wohlgemuth, personal communication, September 9, 2016).

Sex Differences

Overall, men and women did not differ significantly on outcome measures, with the exception of the BASS-Abdomen. A larger percentage of women reported feeling “very dissatisfied” with their abdominal region compared to men (38.5% vs. 21.4%). See Table 1 for information on sex differences in MBSRQ-AE, BASS, BASS-Abdomen, and BIQLI Scores. See Table 2 for sex differences on IWQOL-Lite global and subscale scores.

Table 1

Mean MBSRQ-AE, BASS, BASS-Abdomen, and BIQLI Scores by Sex

Sex (N = 79)	MBSRQ-AE	BASS	BASS-Abdomen	BIQLI
Men (n = 13)	2.72 *(0.61)*	3.13 *(0.61)*	2.14 *(0.86)*	0.96 *(1.61)*
Women (n = 66)	2.83 *(0.70)*	2.98 *(0.71)*	2.07 *(1.14)*	1.16 *(1.29)*

Note. Standard deviation in parentheses. MBSRQ-AE = Multidimensional Body-Self Relations Questionnaire Appearance Evaluation subscale. BASS = Body Areas Satisfaction Scale. BASS-Abdomen = Body Area Satisfaction Scale, abdominal question. BIQLI = Body Image Quality of Life Inventory.

Table 2

Mean IWQOL-Lite Global and Subscale Scores by Sex

Sex (N = 79)	Global	Physical Function	Self-Esteem	Sexual Life	Public Distress	Work
Men (n = 13)	57.36 *(24.71)*	20.57 *(9.97)*	15.07 *(8.33)*	6.50 *(4.03)*	9.36 *(5.17)*	5.86 *(3.23)*
Women (n = 66)	59.52 *(22.76)*	20.23 *(9.51)*	16.55 *(7.55)*	7.60 *(4.55)*	8.75 *(4.16)*	6.42 *(2.92)*

Note. Standard deviation in parentheses. IWQOL-Lite = Impact of Weight on Quality of Life Questionnaire-Lite.

Weight Loss

Average participant BMI at the time of survey completion was 34.30 (*SD* = 6.08). On average, participants described their current weight as 74.59 pounds (*SD* = 26.31) less than their highest weight before undergoing surgery. Average EWL was 60.87% (*SD* = 19.32), and gastric bypass patients experienced greater average EWL (69.65%, *SD* = 17.78) than gastric sleeve patients (59.14%, *SD* =19.27). Twelve-month EWL was 87.56% (*SD* = 7.55) for the gastric bypass and 80.63% (*SD* = 9.38) for the gastric sleeve. See Table 3 for information regarding current BMI, total weight loss, and EWL stratified by time since surgery.

Table 3

Mean Participant BMI at Time of Survey, Total Weight Loss, and EWL by Time Since Surgery

	Current BMI	Total Weight Loss (lb)	EWL
1 month (n = 16)	37.88 *(5.99)*	47.06 *(13.99)*	39.79 *(16.14)*
3 months (n = 18)	37.45 *(6.98)*	60.89 *(17.20)*	47.54 *(9.42)*
6 months (n = 28)	33.16 *(4.46)*	85.21 *(19.94)*	68.26 *(9.49)*
12 months (n = 17)	29.49 *(3.21)*	97.53 *(21.92)*	82.67 *(9.23)*
All time points (N = 79)	34.30 *(6.08)*	74.59 *(26.31)*	60.87 *(19.32)*

Note. Standard deviation in parentheses. BMI = body mass index. EWL = percentage of excess weight loss.

MBSRQ-AE

Mean MSBRQ-AE scores were 2.81 (*SD* = 0.68). For information on MBSRQ-AE scores by time since surgery, see Table 4.

Table 4

Mean MBSRQ-AE, BASS, BASS-Abdomen, and BIQLI Scores by Time Since Surgery

Time Since Surgery	MBSRQ-AE	BASS	BASS-Abdomen	BIQLI
1 month (n = 16)	2.47 *(0.57)*	2.74 *(0.72)*	1.75 *(1.12)*	0.56 *(1.46)*
3 months (n = 18)	2.71 *(0.88)*	2.99 *(0.86)*	2.17 *(1.38)*	1.17 *(1.38)*
6 months (n = 28)	2.91 *(0.55)*	3.03 *(0.52)*	2.14 *(0.80)*	1.22 *(1.26)*
12 months (n = 17)	3.07 *(0.63)*	3.23 *(0.71)*	2.24 *(1.15)*	1.48 *(1.28)*
All time points (N = 79)	2.81 *(0.68)*	3.01 *(0.69)*	2.09 *(1.09)*	1.13 *(1.34)*

Note. Standard deviation in parentheses. MBSRQ-AE = Multidimensional Body-Self Relations Questionnaire Appearance Evaluation subscale. BASS = Body Areas Satisfaction Scale. BASS-Abdomen = Body Area Satisfaction Scale, abdominal question. BIQLI = Body Image Quality of Life Inventory.

A hierarchical multiple regression was run to determine if the addition of time since surgery, total weight loss, and EWL improved the prediction of MBSRQ-AE scores over and above demographic variables (age, sex, marital status, type of surgery) alone.

Initial testing demonstrated significant multicollinearity between time since surgery, total weight loss, and EWL (see Table 5); thus, only EWL was included in the final analysis. Linearity was assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.05. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were no studentized deleted residuals greater than ±3 standard deviations, no leverage values greater than 0.2, and no values for Cook's distance above 1. The assumption of normality was met, as assessed by visual inspection of a Q-Q Plot.

The first model of age, sex, marital status, and type of surgery was not statistically significant, $R^2 = .03$, $F(4, 74) = 0.53$, $p = .717$. The full model of age, sex, marital status, type of surgery, and EWL was statistically significant, $R^2 = .20$, $F(5, 73) = 3.59$, $p = .006$, adjusted $R^2 = .14$. The addition of EWL to the demographic independent variables (age, sex, marital status, type of surgery) led to a statistically significant increase in R^2 of .17, $F(1, 73) = 15.42$, $p < .001$. See Table 6.

Table 5

Correlation between Time Since Surgery, Total Weight Loss, and EWL

	Time Since Surgery	*Total Weight Loss*	*EWL*
Time Since Surgery	1.00	.71	.82
Total Weight Loss	.71	1.00	.67
EWL	.82	.67	1.00

Note. EWL = percentage of excess weight loss.

Table 6

Hierarchical Linear Regression Models Predicting MBSRQ-AE Scores

	B	SE B	R^2	Adj. R^2	ΔR^2
Model 1			.03†	-.025†	--
Age	-.007	.008	--	--	--
Sex	.070	.208	--	--	--
Marital Status	-.063	.070	--	--	--
Surg. Type	-.289	.239	--	--	--
Model 2			.20*	.14*	.17*
Age	.-.004	.007	--	--	--
Sex	.133	.191	--	--	--
Marital Status	-.023	.065	--	--	--
Surg. Type	-.058	.227	--	--	--
EWL	.015	.004	--	--	--

† p = n.s. * $p < .001$

Note. EWL = Percentage of excess weight loss. MBSRQ-AE = Multidimensional Body-Self Relations Questionnaire Appearance Evaluation subscale.

BASS

Mean BASS scores were 3.01 (*SD* = 0.69). For information on BASS scores by time since surgery, see Table 4.

BASS-Abdomen

Mean BASS-Abdomen scores were 2.09 (*SD* = 1.09). A majority of patients reported feeling “very dissatisfied” (35.4%) or “mostly dissatisfied” (36.7%) with their abdominal region. For information on BASS-Abdomen scores by time since surgery, see Table 4. For information on the distribution of BASS-Abdomen satisfaction scores, see Figure 1.

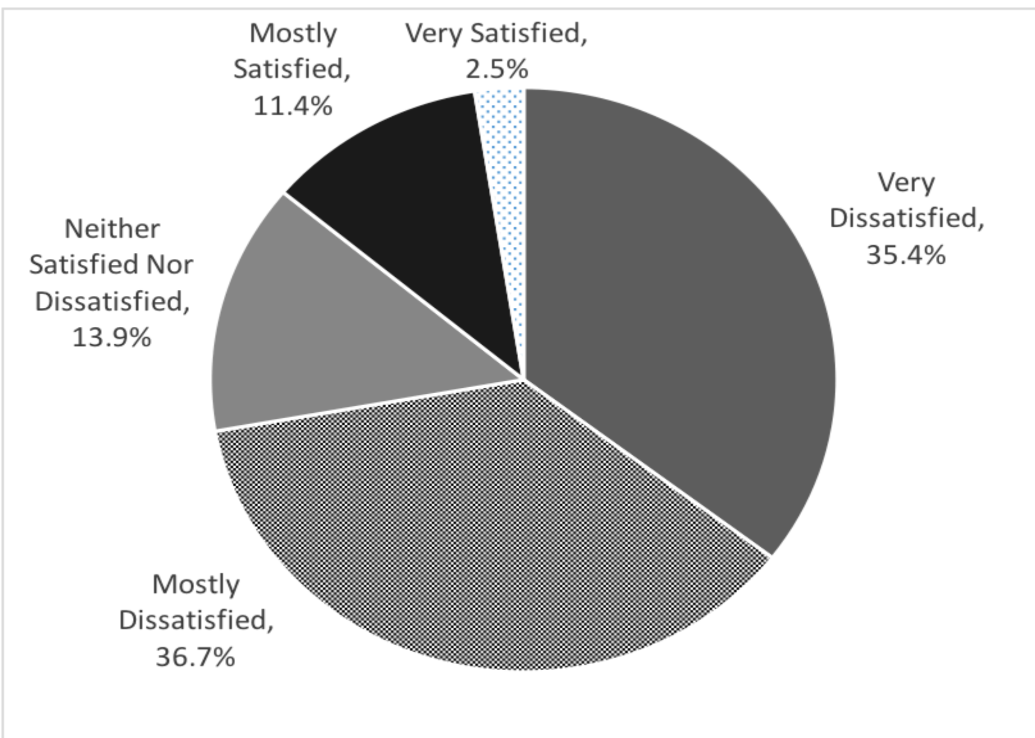

Figure 1. Distribution of Abdominal Satisfaction Scores

BIQLI

Mean BIQLI scores were 1.13 (*SD* = 1.34). For information on BIQLI scores by time since surgery, see Table 4.

A hierarchical multiple regression was run to determine if the addition of time since surgery, total weight loss, and EWL improved the prediction of BIQLI scores over and above demographic variables (age, sex, marital status, type of surgery) alone.

Initial testing demonstrated significant multicollinearity between time since surgery, total weight loss, and EWL (see Table 5); thus, only EWL was included in the final analysis. Linearity was assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.87. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were no studentized deleted residuals greater than ±3 standard deviations, no leverage values greater than 0.2, and no values for Cook's distance above 1. The assumption of normality was met, as assessed by visual inspection of a Q-Q Plot.

The first model of age, sex, marital status, and type of surgery was not statistically significant, R^2 = .02, F(4, 74) = 0.40, p = .811. The addition of EWL to the demographic independent variables (age, sex, marital status, type of surgery) led to a statistically significant increase in R^2 of .07, $F(1, 73) = 5.78$, $p = .019$. However, the full model of age, sex, marital status, type of surgery, and EWL was not statistically significant, R^2 = .09, $F(5, 73) = 1.49$, p = .202, adjusted R^2 = .031. See Table 7.

Table 7

Hierarchical Linear Regression Models Predicting BIQLI Scores

	B	SE B	R^2	Adj. R^2	Δ R^2
Model 1			.021†	-.021†	--
Age	-.017	.016	--	--	--
Sex	.189	.411	--	--	--
Marital Status	-.012	.138	--	--	--
Surg. Type	-.241	.473	--	--	--
Model 2			.093†	.031†	.072*
Age	-.014	.015	--	--	--
Sex	.270	.400	--	--	--
Marital Status	.039	.135	--	--	--
Surg. Type	.055	.475	--	--	--
EWL	.019	.008	--	--	--

† p = n.s. *$p < .001$

Note. EWL = percentage of excess weight loss. BIQLI = Body Image Quality of Life Inventory.

IWQOL-Lite

See table 8 for IWQOL-Lite Global and Subscale data. On IWQOL-Lite Global scores and four subscales (excluding Work), participants at earlier time points generally reported a greater impact of weight on their quality of life than participants at later time points.

Table 8

Mean IWQOL-Lite Global and Subscale Scores by Time Since Surgery

Time Since Surgery	Global	Physical Function	Self-Esteem	Sexual Life	Public Distress	Work
1 month (n = 16)	71.31 *(17.16)*	26.62 *(8.75)*	19.56 *(8.50)*	8.50 *(4.15)*	10.31 *(4.01)*	6.31 *(2.30)*
3 months (n = 18)	68.67 *(21.81)*	24.78 *(8.55)*	18.78 *(7.75)*	8.00 *(5.15)*	10.39 *(4.94)*	7.22 *(3.17)*
6 months (n = 28)	50.93 *(19.34)*	15.61 *(5.96)*	14.82 *(6.73)*	6.79 *(4.18)*	7.96 *(3.94)*	5.78 *(2.78)*
12 months (n = 17)	51.12 *(26.88)*	17.82 *(11.40)*	13.00 *(6.70)*	6.76 *(4.52)*	7.35 *(3.95)*	6.24 *(3.56)*
All time points (N = 79)	59.14 *(22.97)*	20.29 *(9.53)*	16.29 *(7.66)*	7.41 *(4.46)*	8.86 *(4.33)*	6.32 *(2.96)*

Note. Standard deviation in parentheses. IWQOL-Lite = Impact of Weight on Quality of Life Questionnaire-Lite.

A hierarchical multiple regression was run to determine if the addition of time since surgery, total weight loss, and EWL improved the prediction of IWQOL scores over and above demographic variables (age, sex, marital status, type of surgery) alone.

Initial testing demonstrated significant multicollinearity between time since surgery, total weight loss, and EWL (see Table 5); thus, only EWL was included in the final analysis. One extreme outlier (studentized deleted residual = 3.86) was identified and removed from final analysis, as it was unrepresentative of the population. Linearity was assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.74. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. After removal of the outlier, there were no studentized deleted residuals greater than ±3 standard deviations, no leverage values greater than 0.2, and no values for Cook's distance above 1. The assumption of normality was met, as assessed by visual inspection of a Q-Q Plot.

The first model of age, sex, marital status, and type of surgery was not statistically significant, $R^2 = .11$, $F(4, 73) = 2.27$, $p = .70$, adjusted $R^2 = .06$. The full model of age, sex, marital status, type of surgery, and EWL was statistically significant, $R^2 = .361$, $F(5, 72) = 8.13$, $p < .001$, adjusted $R^2 = .32$. The addition of EWL to the demographic independent variables (age, sex, marital status, type of surgery) led to a statistically significant increase in R^2 of .25, $F(1, 72) = 28.19$, $p < .001$. See Table 9.

Table 9

Hierarchical Linear Regression Models Predicting IWQOL-Lite Scores

	B	SE B	R^2	Adj. R^2	ΔR^2
Model 1			.11†	.06†	--
Age	.444	.242	--	--	--
Sex	3.673	6.353	--	--	--
Marital Status	4.952	2.126	--	--	--
Surg. Type	18.378	7.317	--	--	--
Model 2			.36*	.32*	.25*
Age	.326	.208	--	--	--
Sex	.935	5.448	--	--	--
Marital Status	3.434	1.837	--	--	--
Surg. Type	9.034	6.489	--	--	--
EWL	-.587	.111	--	--	--

† p = n.s. * $p < .001$

Note. EWL = percentage of excess weight loss. IWQOL-Lite = Impact of Weight on Quality of Life Questionnaire-Lite.

Body Contouring and Body Satisfaction

A scatterplot of body contouring consideration against BASS scores was plotted to determine whether body dissatisfaction predicted willingness to consider body contouring surgery. Visual inspection of the scatterplot indicated a linear relationship between the variables. No outliers were identified. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.08. There was homoscedasticity, as assessed by visual inspection of a plot of standardized residuals versus standardized predicted values. Residuals were normally distributed as assessed by visual inspection of a normal probability plot. There was a nonsignificant R^2 correlation of .002 (p = .716) between interest in body contouring surgery and BASS scores.

An additional scatterplot of intent to pursue body contouring against BASS scores was plotted to determine whether body dissatisfaction predicted interest in pursuing body contouring surgery. Visual inspection of the scatterplot indicated a linear relationship between the variables. No outliers were identified. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.09. There was homoscedasticity, as assessed by visual inspection of a plot of standardized residuals versus standardized predicted values. Residuals were normally distributed as assessed by visual inspection of a normal probability plot. There was a nonsignificant R^2 correlation of .006 (p = .481) between intent to pursue body contouring surgery and BASS scores.

Body Contouring and Abdominal Dissatisfaction

A scatterplot of body contouring consideration against BASS-Abdominal satisfaction scores was plotted to determine whether abdominal dissatisfaction predicted willingness to consider body contouring surgery. Visual inspection of the scatterplot indicated a linear relationship between the variables. No outliers were identified. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.87. There was homoscedasticity, as assessed by visual inspection of a plot of standardized residuals versus standardized predicted values. Residuals were normally distributed as assessed by a visual inspection of a normal probability plot. There was a nonsignificant R^2 correlation of .04 (p = .084) between interest in body contouring surgery and BASS scores.

An additional scatterplot of intent to pursue body contouring against BASS-Abdominal satisfaction scores was plotted to determine whether abdominal dissatisfaction predicted interest in pursuing body contouring surgery. Visual inspection of the scatterplot indicated a linear relationship between the variables. No outliers were identified. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.89. There was homoscedasticity, as assessed by visual inspection of a plot of standardized residuals versus standardized predicted values. Residuals were normally distributed as assessed by a visual inspection of a normal probability plot. There was a nonsignificant R^2 correlation of .03 (p = .110) between intent to pursue body contouring surgery and BASS scores.

Body Contouring and Finances

Interest. See Figure 2 for information regarding participants' current willingness to consider body contouring surgery. See Figure 3 for information regarding participants' hypothetical level of willingness to consider body contouring surgery.

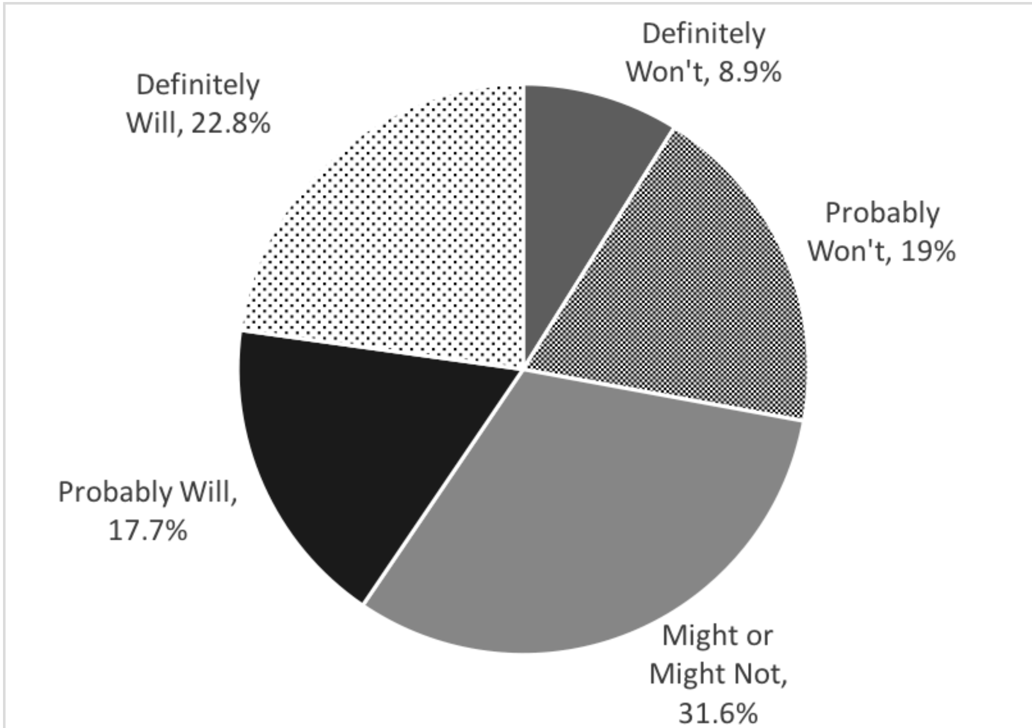

Figure 2. Currently, How Likely Are You to Consider Body Contouring Surgery?

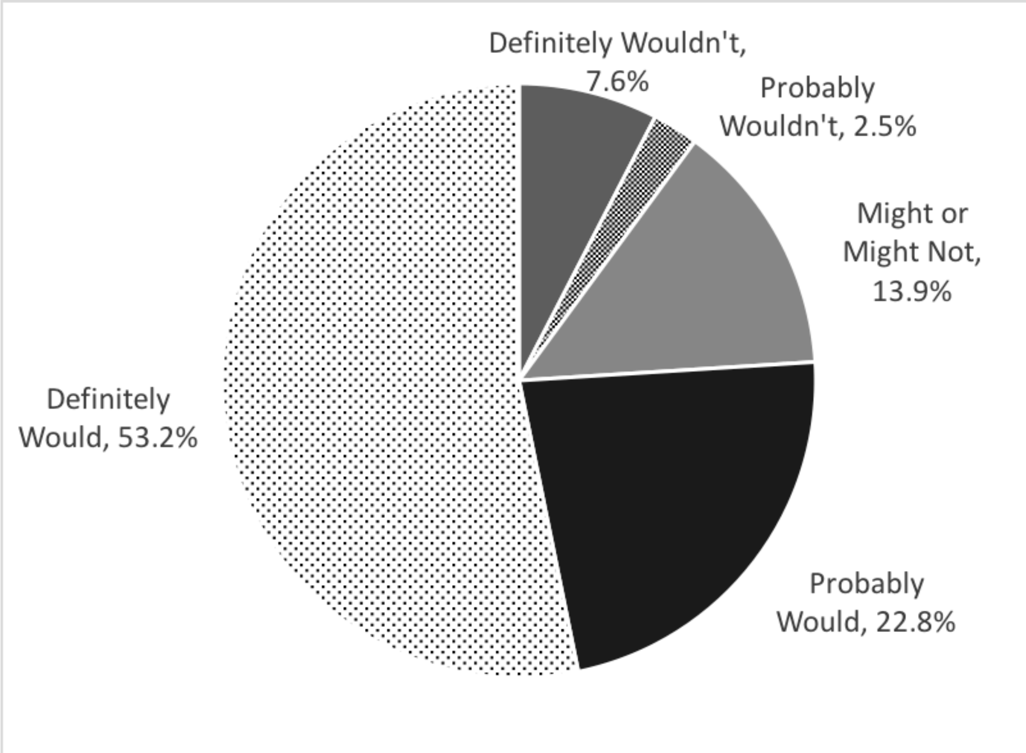

Figure 3. If Finances/Insurance Coverage Were No Issue, How Likely Would You Be to Consider Body Contouring Surgery?

Impact of finances on interest. A paired-samples t-test was used to determine whether there was a statistically significant mean difference in participants' current consideration of body contouring surgery vs. consideration of surgery if financial coverage were available. Six outliers were detected that were more than 1.5 box-lengths from the edge of the box in a boxplot. Two were removed due to suspected participant error. Four were included, as inspection of their values did not reveal them to be extreme. The difference scores for the current and hypothetical (i.e., financial coverage) trials were normally distributed, as assessed by visual inspection of a Normal Q-Q plot.

Compared to their current consideration of body contouring surgery (M = 3.27, SD = 1.27), participants reported significantly greater willingness to consider body contouring surgery when asked to consider available financial coverage (M = 4.20, SD = 1.11). Financial coverage elicited an increase in consideration scores of 0.92, 95% CI [0.70, 1.15], $t(76) = 8.12$, $p < .001$. See Figure 4.

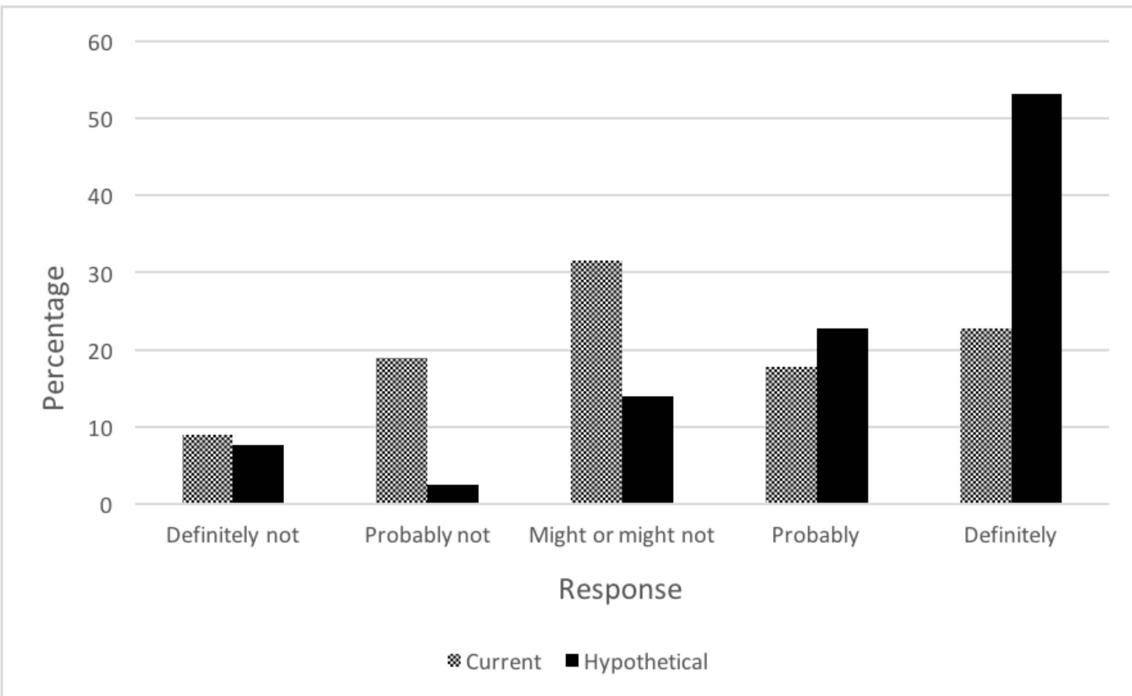

Figure 4. Participants' Current and Hypothetical Willingness to Consider Body Contouring Surgery

Desire to pursue. See Figure 5 for information regarding participants' current level of interest in pursuing body contouring surgery. See Figure 6 for information regarding participants' hypothetical level of interest in pursuing body contouring surgery.

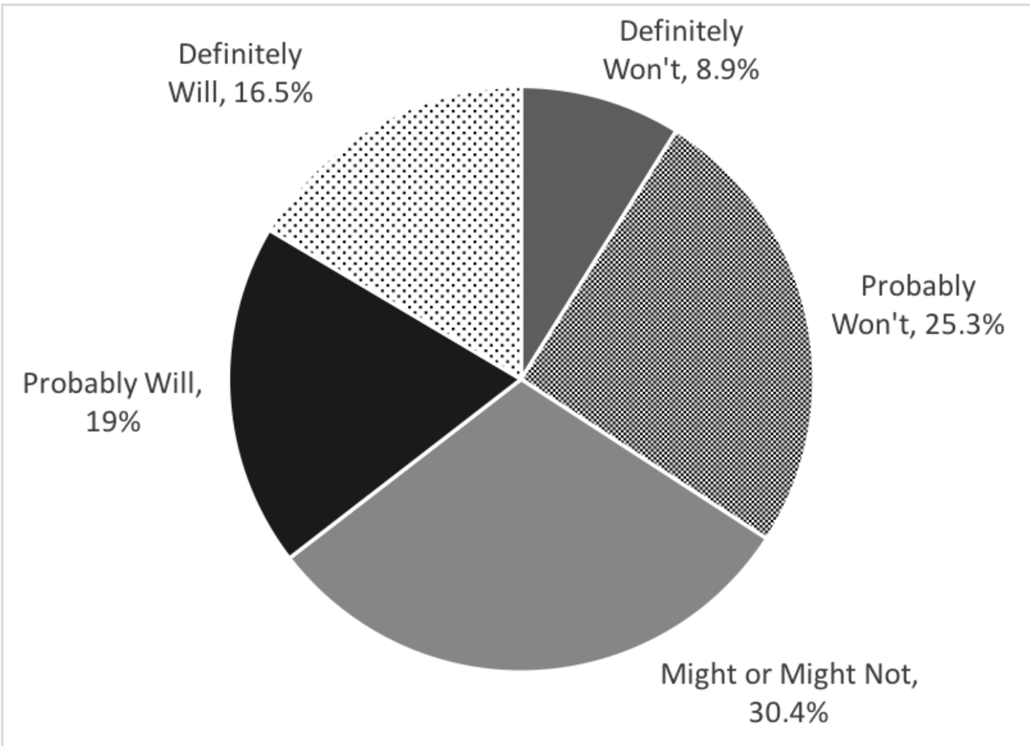

Figure 5. Currently, How Likely Are You to Actually Pursue Body Contouring Surgery?

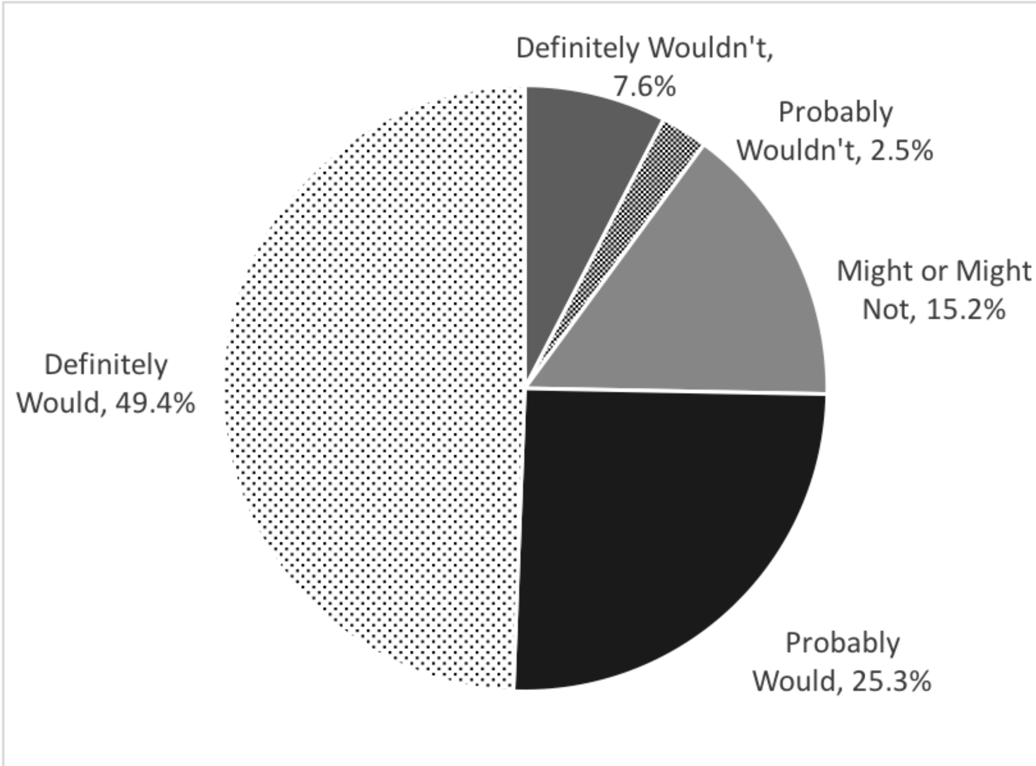

Figure 6. If Finances/Insurance Coverage Were No Issue, How Likely Would You Be to Actually Pursue Body Contouring Surgery?

Impact of finances on desire to pursue. A paired samples t-test was used to determine whether there was a statistically significant mean difference in participants' current intent to pursue body contouring surgery vs. intent to pursue surgery if financial coverage were available. There were no outliers in the data, as assessed by inspection of a boxplot. The difference scores for the current and hypothetical (i.e., financial coverage) trials were normally distributed, as assessed by visual inspection of a Normal Q-Q plot.

Compared to their current intent to pursue body contouring surgery (M = 3.09, SD = 1.21), participants reported significantly greater interest in pursuing surgery when asked to consider available financial coverage (*M* = 4.06, *SD* = 1.20). Financial coverage elicited an increase in intent to pursue scores of 0.97, 95% CI [.73, 1.22], $t(78) = 7.811$, $p < .001$. See Figure 7.

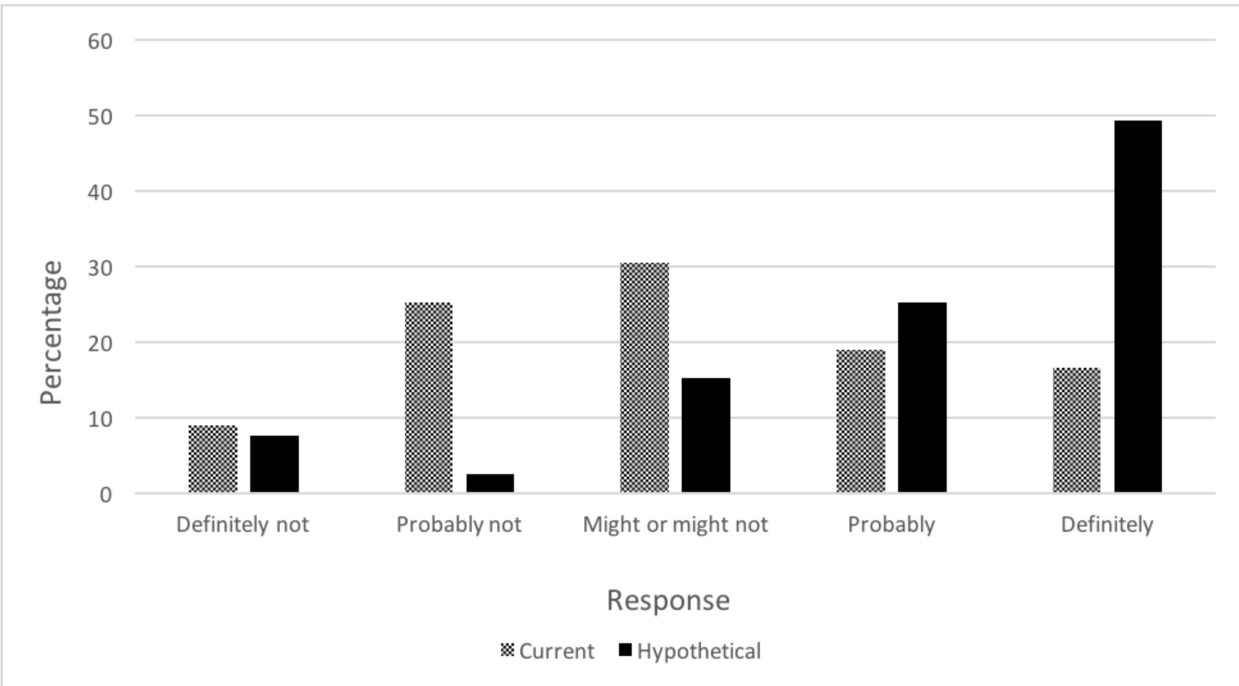

Figure 7. Participants' Current and Hypothetical Intent to Pursue Body Contouring Surgery

Presurgical Motivations and Correlates

Motivations for Surgery. Seven thematic categories were identified upon reviewing participants' self-described motivations for pursuing bariatric surgery. These categories included general health, diabetes, general QOL, longevity, appearance/self-esteem, weight, and family/relationships. See Table 10 for sample responses from each category.

Table 10

Motivation Categories and Sample Responses

Category	Sample Responses
General Health	"wanted to be healthier," "prevent and do away with co-morbid issues"
Diabetes	"get off diabetic meds," "did not want to go on insulin for my diabetes"
General QOL	"have a better quality of life," "live a full life"
Longevity	"longer life," "live a healthier life now in my twenties before I was in my fifties," "extend my [. . .] quantity of life"
Appearance/ Self-Esteem	"I hated how I look in clothes," "feel better about myself"
Weight	"Needed help with long-term weight loss success," "Struggled with weight all my life"
Family/ Relationships	"keep up with my grandchildren," "I have an eleven year old child and wanted to be able to do more things with her"

Note. QOL = quality of life.

All participants articulated between one and three motivations for pursuing surgery. See Table 11 for a summary of these responses. General health (i.e., desire to improve health, resolve non-diabetes related medical conditions) was the most commonly reported motivator, cited by 69.6% of participants. General QOL and appearance/self-esteem were the second most commonly reported motivators, each cited by 24.1% of respondents. Consistent with the literature, those citing appearance as a motivator for pursuing surgery were predominantly female (89.47%). Those citing family/relationships as a motivator were exclusively female (100%).

Table 11

Frequency of Motivators in Patients' Desire to Pursue Bariatric Surgery

		Count	% Respondents	% Total Responses
Motivations for Pursuing Bariatric Surgery	General health	55	69.6%	26.8%
	Diabetes	13	16.5%	6.3%
	General QOL	19	24.1%	9.3%
	Longevity	12	15.2%	5.9%
	Appearance/self-esteem	19	24.1%	9.3%
	Weight	17	21.5%	8.3%
	Family/relationships	13	16.5%	6.3%
	None reported*	57	72.2%	27.8%
	Total	205	100.0%	100.0%

**Only applicable to responses 2 and 3.*

Note: Total response count was greater than 79 due to allowance of multiple responses.

Role of Appearance- and Self-Esteem-Related Motivation. An independent samples t-test was used to determine whether differences existed in MBSRQ-AE scores between participants who did or did not cite appearance/self-esteem as a motivator for pursuing surgery. There were no outliers in the data, as assessed by inspection of a boxplot. MBSRQ scores were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$). There was homogeneity of variances, as assessed by Levene's test for equality of variances ($p = .758$). Overall, 19 participants referenced appearance/self-esteem as a primary motivator for pursuing surgery, and

60 did not. Mean MBSRQ scores were 2.75 (*SD* = 0.73) for those referencing appearance, and 2.82 (*SD* = 0.67) for those not referencing appearance. There was no statistically significant difference in mean MBSRQ scores between those referencing vs. not referencing appearance, $t(77) = -0.37$, $p = .713$.

Another independent samples t-test was used to determine whether differences existed in BASS scores between participants who did or did not cite appearance/self-esteem as a motivator for pursuing surgery. There were no outliers in the data, as assessed by an inspection of a boxplot. BASS scores were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$). There was homogeneity of variances, assessed by Levene's test for equality of variances ($p = .251$). Mean BASS scores were 2.86 (*SD* = 0.77) for those referencing appearance, and 3.05 (*SD* = 0.67) for those not referencing appearance. There was no statistically significant difference in mean BASS scores, $t(77) = -1.03$, $p = .307$.

An additional independent samples t-test was used to determine whether differences existed in BIQLI scores between participants who did or did not cite appearance/self-esteem as a motivator for pursuing surgery. One outlier was identified and included in final analysis, as inspection of its value did not reveal it to be extreme (BIQLI score = -2.32). BIQLI scores were normally distributed for both those referencing appearance and those not referencing appearance, as assessed by visual inspection of Normal Q-Q plots. These was homogeneity of variances, as assessed by Levene's test for equality of variances ($p = .514$). Mean BIQLI scores were 1.11 (*SD* = 1.27) for those referencing appearance, and 1.13 (*SD* = 1.37) for those not referencing appearance. There was no statistically significant difference in mean BIQLI scores, $t(77) = -0.034$, $p = .514$.

An independent samples t-test was also run to determine whether participants citing appearance/self-esteem as a motivator for pursuing surgery experienced greater weight loss than those not citing appearance. There were no outliers in the data, as assessed by inspection of a boxplot. EWL was normally distributed amongst both participant groups, as assessed by Shapiro-Wilk's test ($p > .05$). There was homogeneity of variances, assessed by Levene's test for equality of variances ($p = .833$). Overall, 19 participants referenced appearance/self-esteem as a primary motivator for pursuing surgery and 60 did not. Mean EWL was 61.89 (*SD* = 20.18) for those referencing appearance/self-esteem, and 60.55 (*SD* = 19.21) for those not referencing appearance/self-esteem. There was no statistically significant difference in mean %EWL between those referencing vs. not referencing appearance, $t(77) = 0.26$, $p = .795$.

Role of Health-Related Motivation. An independent samples t-test was performed to determine whether participants citing health as a motivator for pursuing surgery experienced greater weight loss than those not citing health. There were no outliers in the data, as assessed by inspection of a boxplot. EWL was normally distributed amongst both participant groups, as assessed by Shapiro-Wilk's test ($p > .05$). There was homogeneity of variances, assessed by Levene's test for equality of variances ($p = .674$). Overall, 55 participants referenced health as a primary motivator for pursuing surgery, and 24 did not. Mean EWL was 60.7 (*SD* = 20.02) for those referencing health, and 61.26 (*SD* = 18.05) for those not referencing health. There was no statistically significant difference in mean EWL between those referencing vs. not referencing health, $t(77) = -0.12$, $p = .908$.

Role of Family/Relational Motivation. An independent samples t-test was performed to determine whether participants citing family/relationships as a motivator for pursuing surgery experienced greater weight loss than those not citing family/relationships. There were no outliers in the data, as assessed by inspection of a boxplot. EWL was normally distributed amongst both participant groups, as assessed by Shapiro-Wilk's test ($p > .05$). There was homogeneity of variances, assessed by Levene's test for equality of variances ($p = .261$). Overall, 13 participants referenced family/relationships as a primary motivator for pursuing surgery, and 66 did not. Mean EWL was 61.17 ($SD = 17.23$) for those referencing family/relationships, and 60.82 ($SD = 19.83$) for those not referencing relationships. There was no statistically significant difference in mean EWL for those referencing vs. not referencing family/relationships, $t(77) = 0.06$, $p = .953$.

CHAPTER IV

Discussion

The present study sought to validate existing literature about the psychosocial outcomes of bariatric surgery while expanding upon new or understudied topics. These topics included pre-surgical motivations and their correlates, the impact of finances on patients' interest in body contouring procedures, and the utility of the BIQLI with a bariatric population. Overall, this study demonstrated an array of findings, some of which were consistent with previous literature, some of which were inconsistent with previous literature, and several of which were novel within the existing body of research.

Findings and Clinical Implications

Weight Loss Outcomes. Unsurprisingly, the results of the present study demonstrate that bariatric surgery leads to substantial weight loss in the first postoperative year. This was reflected not only in the average EWL endorsed by patients (60.87% across all time points and participants), but also in the strong correlation between EWL and time since surgery. Notably, this participant sample endorsed higher EWL than a nationally representative comparison. A meta-analysis by Fisher et al. (2012) found average 12-month EWL to be 56.1% among gastric sleeve patients and 68.3% among gastric bypass patients. By comparison, the present study found average 12-month EWL of 80.63% and 87.56% among sleeve and bypass patients, respectively. Although this could reflect unique sample differences – such as superior weight loss outcomes at the clinic where this study took place, or improvements in postsurgical outcomes in recent years – these differences more likely exist due to the limited sample size and reliance on self-reported weight data from participants. In the Limitations section below, these factors will be addressed further.

Surgery Types. A substantial majority of patients in the present study (83.5%) reported undergoing gastric sleeve surgery, and only 16.5% (or 13 participants) chose gastric bypass procedures. These findings underscore the growing popularity of the gastric sleeve, which became the most popular type of bariatric surgery in 2013 and has been growing in popularity ever since (ASMBS, 2016). However, the present study demonstrated a higher proportion of sleeves (83.5% vs. 53.8%) and lower proportion of bypasses (16.5% vs. 23.1%) than observed nationally (ASMBS, 2016). Thus, the findings of the present study may be more generalizable to gastric sleeve patients while limiting opportunities for comparisons between surgical procedures.

Patient demographics. The participants in the current study were comparable to national samples on the basis of sex (83.3% vs. 81.36% female; Fuchs et al., 2015) and average age (44.39 vs. 43 years; Pratt et al., 2009). As previously noted, race/ethnicity data were unfortunately unavailable for analysis in the present study, though data from a national longitudinal database indicate that 78.12% of bariatric patients identify as Caucasian, 10.52% as African-American, and 6.02% as Hispanic (DeMaria, Pata, Warthen, & Winegar, 2010).

Notably, patient demographics (age, sex, marital status, and type of surgery) did not account for *any* of the variance observed in psychosocial outcomes (body image, QOL, or BIQOL). However, multiple previous studies have demonstrated a relationship between demographic variables (particularly younger age and being single) and better weight loss outcomes (e.g., Contreras et al., 2013; Livingston et al., 2002; Lufti et al., 2006; Phelan, & Nguyen, 2016; Scozzari et al., 2012). Despite the relationship between weight loss and body image, QOL, and BIQOL, the present study indicates that demographic variables do not predict differences independently in these psychosocial outcomes. Taken together, this suggests that weight loss may be a significant mediating factor between demographic variables and psychosocial outcomes. Future studies may wish to test this theory, as well as identify other potential confounding/mediating variables.

Body Image. Predictions regarding the impact of weight loss on body image were supported, as demonstrated by a positive correlation between EWL and MBSRQ-AE scores. These findings are consistent with previous research, which demonstrates significant improvements in body image after weight loss and bariatric surgery (e.g., De Panfillis et al., 2007; Dixon et al., 2002; Hrabosky et al., 2006; Neven et al., 2002; Pecori et al., 2007; Sarwer et al., 2010). Furthermore, the consistency of these results with existing body image literature lends additional support for the standalone use of the MBSRQ Appearance Evaluation subscale as a valid measure of body image in postsurgical bariatric patients.

Although the literature frequently reports that women have poorer body image when compared to men (e.g., Grabe & Hyde, 2006; Schwartz & Brownell, 2004), this trend was not observed in the present study. While this is likely due to the relatively small sample of male participants, this could also reflect unique sample differences (i.e., male participants in this study endorsing lower body image comparable to female participants).

QOL. Consistent with previous literature, IWQOL-Lite scores generally improved with time since surgery. A notable exception to this trend was the IWQOL-Lite Work subscale, which did not vary between time groups. However, previous studies (e.g., Dymek et al., 2002; Kolotkin et al., 2001) have also found weak or minimal correlations between Work subscale scores and time since surgery.

Predictions regarding the impact of weight loss on QOL were supported, as demonstrated by a negative correlation between EWL and IWQOL-Lite scores. These findings are consistent with a robust body of literature demonstrating a relationship between weight loss and QOL (e.g., Boan et al., 2004; Dymek et al., 2002; Engel et al., 2003; Hell et al., 2000; Kolotkin et al., 2012; Mamplekou et al., 2005; Nickel et al., in press; Sarwer et al., 2010). The results of the present study serve to validate previous findings in this area, as well as support the use of the IWQOL-Lite within the bariatric population.

BIQOL. Unlike body image and QOL outcomes, BIQOL did not appear to be significantly correlated with any demographic or outcome variables. This is in stark contrast with existing BIQOL research. Demographically, Rusticus et al. (2008) found that women reported lower BIQOL than men. Although the results of the present study found the opposite effect (i.e., BIQLI scores of 1.16 vs. 0.96 in women vs. men), these results were not significant. The lack of significant sex differences in the present study may be attributable to the relatively small sample of male participants.

Predictions regarding the impact of weight loss on BIQOL were not supported. Notably, the BIQLI was the only psychosocial outcome measure not correlated with EWL. Again, this represents a departure from previous studies of BIQOL. Cash and Fleming (2002) found a negative correlation between BMI and BIQLI scores among women. Furthermore, the only known study investigating BIQOL in a postsurgical population found improvements in BIQLI scores over time (i.e., presurgical vs. 20 weeks postsurgical, 20 weeks postsurgical vs. 40 weeks postsurgical; Sarwer et al., 2010).

Several reasons may have contributed to the absence of a correlation between EWL and BIQLI scores in the present study. First, the BIQLI was developed and normed on a sample of college women (Cash and Fleming, 2002). The instrument's use among men, adults, healthcare populations, and obese persons has been largely limited, and only one study to date has utilized the BIQLI with a postsurgical bariatric sample (Sarwer et al., 2010). It is presently unclear whether the BIQLI has adequate validity for use in a bariatric population – although the results of the present study would suggest that it does not. Second, the lack of significant findings might reflect underlying weaknesses in the psychometric properties of the BIQLI, which has not been utilized in research as frequently as the MBSRQ or the IWQOL-Lite. Finally, BIQOL is a relatively new concept in the field of psychological research, and it may be possible that BIQOL is not sufficiently unique from body image and/or QOL to stand on its own as a construct. Future studies should continue to investigate the BIQLI among a variety of clinical and nonclinical samples to determine whether its continued use is merited.

Body Contouring. The present study demonstrates that body contouring surgery is highly appealing to many postsurgical bariatric patients, with 40.5% of participants indicating that they are "probably" or "definitely" considering surgery, and 35.5% indicating that they are "probably" or "definitely" pursuing it. When asked to imagine financial coverage, these figures rose substantially: 76% of participants indicated they would "probably" or "definitely" consider body contouring surgery, and 74.7% indicated they would "probably" or "definitely" pursue it. These proportions are comparable to those reported by Kitzinger et al. (2012), who found that body contouring surgery was desired by 75% of female and 68% of male postsurgical bariatric patients.

Predictions regarding body contouring surgery and its correlates were variable. Counterintuitively, body dissatisfaction did not appear to be predictive of patients' desire for body contouring surgery. Although no known studies have specifically examined the impact of body dissatisfaction on *desire* for body contouring surgery, body image does appear to be associated with body contouring surgery in other ways. Patients scheduled for body contouring surgery report high levels of insecurity and perceived unattractiveness (Bolton et al., 2003;

Koller et al., 2013), and those who have undergone body contouring surgery experience improvements in body image and self-esteem (Cintra et al., 2008; Modaressi et al., 2013). The results of this study suggest that while body image is positively impacted by body contouring surgery, it does not appear to be a motivating factor for pursuing body contouring procedures in the first place. Rather, the medical and functional difficulties caused by redundant skin appear to be more salient motivators. The medical, functional, and psychological factors motivating patients to pursue body contouring surgery could be examined more closely in future studies.

Furthermore, the BASS may not have been an ideal measure of body dissatisfaction for use in this patient sample. Although the nine items comprising the BASS do inquire about some areas that are distressing to postsurgical bariatric patients (e.g., mid torso and lower torso regions), many items (e.g., height, hair, face) bear little to no relevance. When only the BASS-Abdomen item was examined, the correlations between body dissatisfaction and desire for body contouring surgery significantly increased (though remained non-significant overall; $p = .084$ vs. $p = .716$ for body contouring consideration; $p = .110$ vs. $p = .481$ for body contouring intent to pursue). Similarly, Bolton et al. (2003) found that “mid-torso” responses were the only BASS item to change significantly before and after body contouring surgery.

Financial Considerations. The prohibitive cost of body contouring surgery is an additional factor warranting consideration both within the scope of this study and more broadly. As noted earlier, body contouring surgery procedures are considered “cosmetic” and are therefore not covered by most insurance companies. As predicted, patients in the present study reported significantly higher willingness to consider or pursue body contouring surgery if financial coverage were available. Remarkably, the proportion of patients indicating they would “definitely” consider or pursue body contouring surgery doubled and tripled, respectively, when asked to imagine financial coverage for these procedures.

Sioka and colleagues (2015) found that only 25% of patients identified financial constraints as their primary reason for not seeking body contouring surgery. However, the results of the present study suggest that a substantial proportion of patients view financial constraints as *a* barrier – if not the *primary* barrier – in seeking body contouring surgery. While this suggests that a higher percentage of postsurgical bariatric patients would consider or pursue body contouring surgery in the absence of financial constraints, the clinical implications of these findings warrant cautious consideration. In particular, it is unclear whether participants’ hypothetical interest would translate to more actual procedures. Future studies could examine the impact of insurance coverage on demand for body contouring – or compare the prevalence of body contouring procedures in nations where they are or are not financially covered.

Motivations for Surgery. Very few studies to date have examined presurgical motivations among bariatric patients, and even fewer have investigated the postsurgical correlates of these motivations. The present study shed a much-needed light on this area. Consistent with previous studies (Dixon et al., 2009; Kaly et al., 2008; Libeton et al., 2004; Munoz et al., 2008; Strommen et al., 2009; Wee et al., 2006), health-related reasons were the most commonly reported motivator for pursuing bariatric surgery, followed by reasons related to QOL and appearance/self-esteem.

However, this study expanded upon the existing literature in two meaningful ways. First, most studies examining motivation have limited participants to selecting their top one or two motivations. The present study did not place restrictions on the number of permissible responses, and a large percentage of participants (28.8%) wound up naming three motivating factors.

Second, the present study utilized an open-ended, qualitative approach, which allowed for a broader range of responses than a multiple-choice format. This open-ended response format revealed the presence of several motivating factors that have not been widely addressed in the literature: diabetes-related factors, family/relationship-related factors, and weight loss-related factors. Weight loss-related motivations (e.g., desire to lose weight, lack of previous weight loss successes) were identified by a surprisingly large proportion of patients (21.5%). Although this makes intuitive sense, given the intractable weight difficulties that lead patients to pursue bariatric surgery in the first place, weight-related motivations have not been identified or addressed by previous studies. The identification of these previously unacknowledged motivators could provide an important framework for future studies examining pre-surgical motivations among bariatric patients.

Predictions regarding pre-surgical motivations and their postsurgical correlates did not reveal any significant findings. Previous studies have found that patients identifying appearance-related motivators were more likely to be young and female, endorse poorer QOL and body image, and report more depressive symptoms (Dixon et al., 2009; Libeton et al., 2004). Although the present study found most participants reporting appearance-related motivations were female (89.47%), appearance-related motivations were not associated with measures of body image, body area satisfaction, or BIQOL. As previously addressed, instruments used to assess body area satisfaction (BASS) and BIQOL (BIQLI) may have been inappropriate measures for use in this study, which may partially account for the lack of results in this area.

Additionally, the present study failed to replicate the findings of Dixon et al. (2009), which demonstrated a slight improvement in weight loss outcomes among participants citing appearance/self-esteem as a motivator for pursuing surgery. Furthermore, neither health-related nor family-related motivating factors were associated with weight loss outcomes. However, no previous studies have identified a correlation between these motivations and any postsurgical outcome.

Although none of the predictions regarding pre-surgical motivations or their postsurgical correlates were supported, the present study nonetheless provides valuable descriptive information regarding patients' reasons for pursuing bariatric surgery. If, in the future, pre-surgical motivations are found to correlate with postsurgical outcomes, these motivations could provide a meaningful source of predictive information for bariatric providers and their patients.

Study Limitations

Although this study demonstrated several noteworthy findings, its limitations nonetheless warrant careful consideration. Although not an exhaustive list, the following limitations may apply to the present study and its findings.

Participant Limitations. The present study involved data collection at a single site. Although certain demographic characteristics were comparable to a national sample (i.e., average age of participants, percentage of female patients), other characteristics were unique to this setting (i.e., the relatively large proportion of sleeve procedures compared to the national average). Furthermore, while none of this study's hypotheses specifically addressed racial or educational differences, the accidental exclusion of these variables from the demographic questionnaire eliminated the ability to investigate potentially interesting hypotheses or compare this patient population to national norms.

Although single-site studies do offer some advantages (e.g., logistics, financial cost, establishment of norms for future multi-site studies), they are nonetheless associated with drawbacks. Most significantly, single-site studies may lack generalizability to the overall population, thus limiting the clinical usefulness of their findings.

Furthermore, the present study's exclusionary criteria did not directly address revisional bariatric surgery. Revisional procedures are routinely performed when primary surgical interventions have failed (e.g., failure to lose weight, weight regain) or led to serious complications (e.g., obstruction, leaks; ASMBS, 2014b). In high-risk or super obese patients, revisionary surgery is often pre-planned, or "staged," by converting a gastric sleeve to a gastric bypass (Brethauer, Hammel, & Schauer, 2009). Revisionary procedures are growing in popularity and accounted for 13.6% of all bariatric surgeries performed in 2015 (ASMBS, 2016). However, many patients undergoing revisionary surgery exhibit unique behavioral or medical difficulties distinguishing them from the bariatric population at large. While the present study excluded patients who had ever undergone a Lap band procedure, it is conceivable that patients who had undergone other types of revisionary surgery (e.g., converting a sleeve to a bypass, fixing a failed bypass) could have participated in the study.

Analytical Limitations. Several limitations in statistical analysis must also be considered. First, although the present study demonstrated sufficient power to detect medium effect sizes or larger ($f^2 \geq .15$), most of the statistical models run in the present study lacked the power to identify smaller effect sizes, thus impairing opportunities to identify smaller (but still clinically meaningful) results. Furthermore, the smaller sample size necessitated utilizing multiple smaller models (as in Hypothesis 2) rather than a single large model, which may have increased the chance for type I error. The cutoff value to determine meaningful results ($p < .05$) also could have inflated the risk for type I error, although most of the meaningful p values in the present study were < .001. Finally, the multicollinearity between time since surgery, total weight loss, and EWL required that only the most pertinent of these factors – in this case, EWL – be included in analysis.

Survey Limitations. Several limitations related to this study's measures were also identified. First, as previously noted, several of the outcome measures (BASS, BIQLI) were suspected to be weak measures of their respective constructs within the bariatric population. The BIQLI, in particular, has a highly limited history of use with bariatric patients. Interestingly, the BIQLI was the one psychosocial outcome measure in this study that was not clearly associated with EWL. Furthermore, the BASS demonstrated less utility in assessing body area dissatisfaction compared to a single item contained within it (BASS-Abdomen).

Second, although the entire 69-question MBSRQ was administered to participants, an abbreviated version of this instrument – the 34-question MBSRQ-Appearance Scales (MBSRQ-AS) – could have been administered in its place. The MBSRQ-AS contains both of the MBSRQ subscales analyzed within this study (AE and BASS) and might have reduced the administration time and ease of completion.

Finally – and perhaps most importantly – the anonymity provided by the present study necessitated the use of participants' self-reported height and weight measurements (including current weight, highest weight, and goal weight). The highest weight measurement was based on participants' "highest weight before pursuing bariatric surgery" and thus may have unintentionally included any large pre-surgical weight losses experienced by patients. Furthermore, although patients were asked to provide the goal weight that had been "determined by [their] surgeon," it is unclear whether patients provided this physician-determined weight or a figure of their own choosing. Several critical variables – including BMI, total weight lost, and EWL – were calculated based on patients' self-reported numbers, as the researcher did not have access to patients' medical records. Given these factors, it is possible that the EWL calculations derived in this study are inconsistent with EWL measurements published elsewhere in the literature. Inaccurate or elevated EWL measurements are particularly suspicious given the abnormally high 12-month EWL figures mentioned previously.

Scoring Limitations. Several limitations were also identified in the scoring of participants' qualitative responses regarding pre-surgical motivations. First, the author of the current study has limited background and training in content coding analysis. Second, within the field of qualitative research, multiple content coders are generally preferred to ensure consistency and freedom from bias (Tong, Sainsbury, & Craig, 2007), and the qualitative responses of the present study were examined and coded only by the author. Finally, although the open-ended parameters of the motivation question provided useful descriptive information, the lack of response consistency may have adversely affected their suitability for analysis. In other words, perhaps the responses and subsequent analyses would have been different (and statistically meaningful) if participants had only shared their primary reason for pursuing surgery, or required participants to choose from a restricted number of options.

Conclusion

Obesity represents a public health crisis within the U.S., and bariatric surgery has emerged as one of the most effective – and long lasting – interventions to treat this condition. Although the substantial weight loss outcomes and improvements in health are evident, the psychosocial benefits of weight loss surgery have been receiving increased attention. However, considerably less attention to body contouring surgery and its correlates has occurred, and to date, only a handful of studies have examined bariatric patients' presurgical motivations and their relevancy to postsurgical outcomes.

The present study has contributed to the existing literature in several ways. First, this study validated existing research demonstrating a correlation between weight loss and improvements in body image and quality of life among postsurgical bariatric patients. Second, this study was the first to determine whether body dissatisfaction predicts desire for body contouring surgery. Third, this study identified financial barriers and a lack of insurance coverage as significant obstacles for patients who desire body contouring surgery. Fourth, this study added to a limited body of research regarding patients' presurgical motivations, and it was among the first to assess for the presence of postsurgical correlates. Finally, this study demonstrated limitations of two published instruments (BIQLI and BASS) within the postoperative bariatric population.

Although the landscape of healthcare is always changing, it is hoped that subsequent research will validate and expand upon the findings described herein, with a goal of one day positively impacting patients and bariatric healthcare providers alike.

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APPENDIX A

INFORMATIONAL FLYER

You may be eligible to participate in a research study
At Sentara Comprehensive Weight Loss Solutions

Why is this study being done?
This study is being conducted to investigate psychosocial outcomes in people who have recently had bariatric surgery. We hope that the results of this study may help the medical community better understand the effects of weight loss surgery.

Who is eligible to participate in this study?
If you are here to attend your 1-month, 3-month, 6-month, *or* 12-month surgical follow-up appointment and have not already completed this study, you are eligible to participate! You must also be between 18 and 65 years old and able to read and understand this information sheet. Patients who have undergone Lap band surgery at any point are not eligible to participate.

What does participation in this study involve?
You will be asked to complete this study after your office visit today. Participation will involve completing an anonymous online questionnaire here at the Sentara Comprehensive Weight Loss Solutions office. No personally-identifying information will be collected, and participation should take just 15 to 20 minutes.

What are the risks and benefits of this study?
There are very few known risks to you through participation in this study, beyond any momentary distress you may experience from reflecting on your weight and size. If you agree to take part in this study, you will not be directly compensated, and you will not receive any feedback about your participation or questionnaire responses. However, we hope the information learned from this study will benefit other people who will have bariatric surgery in the future.

Questions? Please contact the study's primary investigator, Dr. Barbara Cubic, at (757) 446-5888, or ask your bariatric treatment provider.

Thank you for your contribution to research at Sentara!

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

Are you under 18 years old? (Yes / No – if yes, discontinue)

Are you over 65 years old? (Yes / No – if yes, discontinue)

Have you ever had an adjustable gastric band (aka: "Lap band") procedure? (Yes / No – if yes, discontinue)

Every patient has his or her own reasons for wanting to undergo bariatric surgery. What were your motivations for pursuing this treatment? Please try to limit your response to two or three sentences.

What is your age? (___ years)

What is your gender? (Male / Female / Choose not to disclose)

What is your marital status? (Married / Partnered, living as married / Divorced / Single / Widowed / Other) *If "Other," please specify.* (_______)

What type of bariatric surgery did you undergo? (Roux-en-Y gastric bypass [aka: "gastric bypass"] / Vertical sleeve gastrectomy [aka: "gastric sleeve"])

Which type of appointment did you attend today? (1-month postsurgical follow-up / 3-month postsurgical follow-up / 6-month postsurgical follow-up / 12-month postsurgical follow-up / Other) *If "Other," please specify*. (_________)

What is your height? (__ feet, __ inches)

What is your current *weight?* (___ pounds)

What was your highest weight before undergoing bariatric surgery? (___ pounds)

What is your goal weight, or "target weight," as identified by your surgeon? (___ pounds)

"Body contouring" refers to the surgical removal of excess skin in patients who have lost a significant amount of weight. Many patients who undergo body contouring experience the elimination of skin fold rashes/infections, as well as improvements in their movement, the way their clothes fit, and their overall self-image. However, body contouring is not usually covered by insurance, and these procedures typically cost several thousand dollars.

Currently, how likely are you to consider *body contouring surgery?* (Will definitely not consider surgery / Will probably not consider surgery / Might or might not consider surgery / Will probably consider surgery / Will definitely consider surgery)

Currently, how likely are you to actually pursue *body contouring surgery?* (Will definitely not pursue surgery / Will probably not pursue surgery / Might or might not pursue surgery / Will probably pursue surgery / Will definitely pursue surgery)

If finances/insurance coverage were no issue, how likely would you be to consider *body contouring surgery?* (Would definitely not consider surgery / Would probably not consider surgery / Might or might not consider surgery / Would probably consider surgery / Would definitely consider surgery)

If finances/insurance coverage were no issue, how likely would you be to actually pursue *body contouring surgery?* (Would definitely not pursue surgery / Would probably not pursue surgery / Might or might not pursue surgery / Would probably pursue surgery / Would definitely pursue surgery)

APPENDIX C

MULTIDIMENSIONAL BODY-SELF RELATIONS QUESTIONNAIRE

1	2	3	4	5
Definitely Disagree	**Mostly Disagree**	**Neither Agree Nor Disagree**	**Mostly Agree**	**Definitely Agree**

______ 1. Before going out in public, I always notice how I look.

______ 2. I am careful to buy clothes that will make me look my best.

______ 3. I would pass most physical-fitness tests.

______ 4. It is important that I have superior physical strength.

______ 5. My body is sexually appealing.

______ 6. I am not involved in a regular exercise program.

______ 7. I am in control of my health.

______ 8. I know a lot about things that affect my physical health.

______ 9. I have deliberately developed a healthy lifestyle.

______ 10. I constantly worry about being or becoming fat.

______ 11. I like my looks just the way they are.

______ 12. I check my appearance in a mirror whenever I can.

______ 13. Before going out, I usually spend a lot of time getting ready.

______ 14. My physical endurance is good.

______ 15. Participating in sports is unimportant to me.

______ 16. I do not actively do things to keep physically fit.

______ 17. My health is a matter of unexpected ups and downs.

______ 18. Good health is one of the most important things in my life.

______ 19. I don't do anything that I know might threaten my health.

continued on the next page

1	2	3	4	5
Definitely Disagree	**Mostly Disagree**	**Neither Agree Nor Disagree**	**Mostly Agree**	**Definitely Agree**

______ 20. I am very conscious of even small changes in my weight.

______ 21. Most people would consider me good-looking.

______ 22. It is important that I always look good.

______ 23. I use very few grooming products.

______ 24. I easily learn physical skills.

______ 25. Being physically fit is not a strong priority in my life.

______ 26. I do things to increase my physical strength.

______ 27. I am seldom physically ill.

______ 28. I take my health for granted.

______ 29. I often read books and magazines that pertain to health.

______ 30. I like the way I look without my clothes on.

______ 31. I am self-conscious if my grooming isn't right.

______ 32. I usually wear whatever is handy without caring how it looks.

______ 33. I do poorly in physical sports or games.

______ 34. I seldom think about my athletic skills.

______ 35. I work to improve my physical stamina.

______ 36. From day to day, I never know how my body will feel.

______ 37. If I am sick, I don't pay much attention to my symptoms.

______ 38. I make no special effort to eat a balanced and nutritious diet.

continued on the next page

1	2	3	4	5
Definitely Disagree	**Mostly Disagree**	**Neither Agree Nor Disagree**	**Mostly Agree**	**Definitely Agree**

______ 39. I like the way my clothes fit me.

______ 40. I don't care what people think about my appearance.

______ 41. I take special care with my hair grooming.

______ 42. I dislike my physique.

______ 43. I don't care to improve my abilities in physical activities.

______ 44. I try to be physically active.

______ 45. I often feel vulnerable to sickness.

______ 46. I pay close attention to my body for any signs of illness.

______ 47. If I'm coming down with a cold or flu, I just ignore it and go on as usual.

______ 48. I am physically unattractive.

______ 49. I never think about my appearance.

______ 50. I am always trying to improve my physical appearance.

______ 51. I am very well coordinated.

______ 52. I know a lot about physical fitness.

______ 53. I play a sport regularly throughout the year.

______ 54. I am a physically healthy person.

______ 55. I am very aware of small changes in my physical health.

______ 56. At the first sign of illness, I seek medical advice.

______ 57. I am on a weight-loss diet.

continued on the next page

For the remainder of the items use the response scale given with the item, and enter your answer in the space beside the item.

______ 58. I have tried to lose weight by fasting or going on crash diets.

1. Never
2. Rarely
3. Sometimes
4. Often
5. Very Often

______ 59. I think I am:

1. Very Underweight
2. Somewhat Underweight
3. Normal Weight
4. Somewhat Overweight
5. Very Overweight

______ 60. From looking at me, most other people would think I am:

1. Very Underweight
2. Somewhat Underweight
3. Normal Weight
4. Somewhat Overweight
5. Very Overweight

continued on the next page

61-69. Use this 1 to 5 scale to indicate how dissatisfied or satisfied you are with each of the following areas or aspects of your body:

1	2	3	4	5
Very Dissatisfied	**Mostly Dissatisfied**	**Neither Satisfied Nor Dissatisfied**	**Mostly Satisfied**	**Very Satisfied**

______ 61. Face (facial features, complexion)

______ 62. Hair (color, thickness, texture)

______ 63. Lower torso (buttocks, hips, thighs, legs)

______ 64. Mid torso (waist, stomach)

______ 65. Upper torso (chest or breasts, shoulders, arms)

______ 66. Muscle tone

______ 67. Weight

______ 68. Height

______ 69. Overall appearance

APPENDIX D

IMPACT OF WEIGHT ON QUALITY OF LIFE QUESTIONNAIRE-LITE

Impact of Weight on Quality of Life Questionnaire—Lite Version (IWQOL-Lite)

Please answer the following statements by circling the number that best applies to you in the past week. Be as open as possible. There are no right or wrong answers.

Physical Function		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I have trouble picking up objects.	5	4	3	2	1
2.	Because of my weight I have trouble tying my shoes.	5	4	3	2	1
3.	Because of my weight I have difficulty getting up from chairs.	5	4	3	2	1
4.	Because of my weight I have trouble using stairs.	5	4	3	2	1
5.	Because of my weight I have difficulty putting on or taking off my clothing.	5	4	3	2	1
6.	Because of my weight I have trouble with mobility.	5	4	3	2	1
7.	Because of my weight I have trouble crossing my legs.	5	4	3	2	1
8.	I feel short of breath with only mild exertion.	5	4	3	2	1
9.	I am troubled by painful or stiff joints.	5	4	3	2	1
10.	My ankles and lower legs are swollen at the end of the day.	5	4	3	2	1
11.	I am worried about my health.	5	4	3	2	1
Self-esteem		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I am self-conscious.	5	4	3	2	1
2.	Because of my weight my self-esteem is not what it could be.	5	4	3	2	1
3.	Because of my weight I feel unsure of myself.	5	4	3	2	1
4.	Because of my weight I don't like myself.	5	4	3	2	1
5.	Because of my weight I am afraid of being rejected.	5	4	3	2	1
6.	Because of my weight I avoid looking in mirrors or seeing myself in photographs.	5	4	3	2	1
7.	Because of my weight I am embarrassed to be seen in public places.	5	4	3	2	1

Sexual Life		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I do not enjoy sexual activity.	5	4	3	2	1
2.	Because of my weight I have little or no sexual desire.	5	4	3	2	1
3.	Because of my weight I have difficulty with sexual performance.	5	4	3	2	1
4.	Because of my weight I avoid sexual encounters whenever possible.	5	4	3	2	1

Public Distress		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I experience ridicule, teasing, or unwanted attention.	5	4	3	2	1
2.	Because of my weight I worry about fitting into seats in public places (e.g. theaters, restaurants, cars, or airplanes).	5	4	3	2	1
3.	Because of my weight I worry about fitting through aisles or turnstiles.	5	4	3	2	1
4.	Because of my weight I worry about finding chairs that are strong enough to hold my weight.	5	4	3	2	1
5.	Because of my weight I experience discrimination by others.	5	4	3	2	1
Work (Note: For homemakers and retirees, answer with respect to your daily activities.)		ALWAYS TRUE	USUALLY TRUE	SOMETIMES TRUE	RARELY TRUE	NEVER TRUE
1.	Because of my weight I have trouble getting things accomplished or meeting my responsibilities.	5	4	3	2	1
2.	Because of my weight I am less productive than I could be.	5	4	3	2	1
3.	Because of my weight I don't receive appropriate raises, promotions or recognition at work.	5	4	3	2	1
4.	Because of my weight I am afraid to go on job interviews.	5	4	3	2	1

APPENDIX E

BODY IMAGE QUALITY OF LIFE INVENTORY

1

The BIQLI Questionnaire

Instructions: Different people have different feelings about their physical appearance. These feelings are called "body image." Some people are generally satisfied with their looks, while others are dissatisfied. At the same time, people differ in terms of how their body-image experiences affect other aspects of their lives. Body image may have positive effects, negative effects, or no effect at all. Listed below are various ways that your own body image may or may not influence your life. For each item, circle how and how much your feelings about your appearance affect that aspect of your life. Before answering each item, think carefully about the answer that most accurately reflects how your body image usually affects you.

-3	-2	-1	0	+1	+2	+3
Very Negative Effect	Moderate Negative Effect	Slight Negative Effect	No Effect	Slight Positive Effect	Moderate Positive Effect	Very Positive Effect

1.	My basic feelings about myself—feelings of personal adequacy and self-worth.	-3	-2	-1	0	+1	+2	+3
2.	My feelings about my adequacy as a man or woman—feelings of masculinity or femininity.	-3	-2	-1	0	+1	+2	+3
3.	My interactions with people of my own sex.	-3	-2	-1	0	+1	+2	+3
4.	My interactions with people of the other sex.	-3	-2	-1	0	+1	+2	+3
5.	My experiences when I meet new people.	-3	-2	-1	0	+1	+2	+3
6.	My experiences at work or at school.	-3	-2	-1	0	+1	+2	+3
7.	My relationships with friends.	-3	-2	-1	0	+1	+2	+3
8.	My relationships with family members.	-3	-2	-1	0	+1	+2	+3
9.	My day-to-day emotions.	-3	-2	-1	0	+1	+2	+3
10.	My satisfaction with my life in general.	-3	-2	-1	0	+1	+2	+3

-3	-2	-1	0	+1	+2	+3
Very Negative Effect	Moderate Negative Effect	Slight Negative Effect	No Effect	Slight Positive Effect	Moderate Positive Effect	Very Positive Effect

11. My feelings of acceptability as a sexual partner.	-3	-2	-1	0	+1	+2	+3
12. My enjoyment of my sex life.	-3	-2	-1	0	+1	+2	+3
13. My ability to control what and how much I eat.	-3	-2	-1	0	+1	+2	+3
14. My ability to control my weight.	-3	-2	-1	0	+1	+2	+3
15. My activities for physical exercise.	-3	-2	-1	0	+1	+2	+3
16. My willingness to do things that might call attention to my appearance.	-3	-2	-1	0	+1	+2	+3
17. My daily "grooming" activities (i.e., getting dressed and physically ready for the day).	-3	-2	-1	0	+1	+2	+3
18. How confident I feel in my everyday life.	-3	-2	-1	0	+1	+2	+3
19. How happy I feel in my everyday life.	-3	-2	-1	0	+1	+2	+3

VITA

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EDUCATION

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SELECT PRESENTATIONS

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White, A. (2015). Stress vs. burnout: A primer for internal medicine residents. Northeast Ohio Medical University Internal Medicine Didactic, Cleveland Clinic Akron General.

Reynolds, N., Peltzer-Jones, J., & **White, A.** (2014). The missing provider: What health psychology can bring to your team. Poster presentation: Henry Ford Health System, Quality Expo.

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