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UNIVERSITY OF SAN DIEGO
Hahn School of Nursing in Health Science
DOCTOR OF PHILOSOPHY IN NURSING

Bariatric Surgery Regain and Long-Term Weight Loss among Women: Self-Efficacy,
Social Support and Health Promotion Lifestyle Behaviors

by
Raelene Brooks

A dissertation presented to the
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April 2018

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TITLE OF DISSERTATION:

Bariatric Surgery Regain and Long-Term Weight Loss among Women: Self-Efficacy, Social Support and Health Promotion Lifestyle Behaviors

DISSERTATION COMMITTEE:

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Abstract

Although bariatric surgery appears to produce success in a short period of time immediately after surgery, weight regain over time in this population cannot be ignored. Understanding the relationship between potential psychosocial predicting post-surgical variables influencing bariatric surgery may prevent long-term weight regain. The purpose of this research is to examine self-efficacy, social support, and lifestyle habits and their relationship to long term weight loss and regain in women post bariatric surgery. Weight regain is observed as early as 18 months to 2 years after bariatric surgery. Patients face challenges sustaining the dramatic lifestyle changes required to ensure positive long-term weight loss.

A descriptive correlational research design was used to examine relationships among the variables. The demographic data of the women were reviewed for any correlations with reported regain. There were three independent variables explored in this research: self-efficacy, health promotion lifestyle, and social support. The dependent variable in the study was weight regain. The study was advertised for four weeks in a 'bariatric women only' Facebook forum and on the Obesity Help website. A solicitation email was placed on these sites containing five inclusion criteria: adult, female, able to read and write English, Internet users, and underwent bariatric surgery with greater than 18 months or more post-operative time. The research was conducted entirely online using the web-based survey platform SurveyMonkey.

In total, 123/135 participants (91.1%) reported weight regain and 12/135 (8.8%) reported no weight regain. There was a strong negative correlation between the two variables WELQ and regain $p < 0.001$ with high scores self-efficacy associated with lower

reported weight regain. The health promotion lifestyle factors and the perceived social support factors were nonsignificant at the .001 level of significance for a two-sided tailed test.

Participants reporting the ability to resist eating in a variety of situations and settings were more likely to have less weight regain. These results suggest developing and teaching bariatric surgery patients to increase their self-efficacy could play a significant role in decreasing the chances of weight regain over time.

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Dedication

God has blessed my PhD journey with love. To my husband, Dean, thank you for your love, your loyal support, and for your wisdom. I could not have finished this endeavor without you. To Deangelo, my only child, you were the impetus for me to take this PhD journey. I pray God continues to grant you grace and inspiration. Always remember that self-doubt and disbelief can simply be a catalyst for courage, tenacity, and resilience. *Maraming salamat po* to my parents, Rody and Ana; *tinuruan ninyo ako magporsige*. Dad, you remind me always that “It’s about the principle.” I am my father’s daughter.

To Drs. Rossitto, Oliveri, and Winston, women of faith and love who believed in me even when I didn’t believe in myself: you were the answer to my prayers when I asked God for help to make some difficult decisions. Dr. Winston, your generous heart helped to shape my career and pathway. For this and for your friendship I will always be grateful.

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CHAPTER 1

INTRODUCTION

According to the World Health Organization (WHO), obesity has reached worldwide epidemic proportions (2014). In the United States, two-thirds of adults are considered overweight or obese, and more than one-third are considered clinically obese (Ogden, Carroll, Fit, & Flegal, 2014). In 2013, the American Medical Association adopted a policy that recognized obesity as a disease requiring research for treatment and prevention (McCarthy, 2015). Given obesity is considered a chronic disease, bariatric surgery is a reasonable treatment. Individuals who are considered morbidly or clinically severely obese are candidates for bariatric surgery (Geraci, Brunt, & Marihart, 2014).

In 2008, there were a reported 350,000 bariatric procedures performed worldwide with an estimated 220,000 performed in the United States. However impressive the benefits of bariatric surgery, they must be balanced with awareness of complications. Besides psychosocial and nutrition-related complications, approximately 20% of patients fail to lose a significant amount of weight (Andrews, 1996). Further, research indicates that approximately two years post bariatric surgery, weight loss stops and patients begin to regain the weight. Significant weight regain is often classified as regaining 15% of the total weight lost after bariatric surgery (Andrews, 1996). Regain is often attributed to

poor adherence to postoperative dietary practices. This and other unfavorable outcomes may be related to the patient's difficulty adjusting to the modification in eating behavior and inability to follow restrictive instructions closely (Ballantyne, 2003).

The need for long-term post-surgery support has risen as more patients turn to bariatric surgery; whether healthcare provider-led, highly structured, or free flowing, support forums are needed to provide psychosocial and dietary support (Aguilera, 2014). Evaluation of a patient's self-efficacy, post-surgical lifestyle habits, and social support is helpful for addressing the loss of a previous reliance on food to cope with feelings such as anger, loneliness, fatigue, boredom, depression, emptiness, and anxiety. The conscious decision to practice new behaviors in response to feelings is necessary in long-term weight maintenance.

Many bariatric post-surgical studies do not extend past the immediate postoperative or one-year postoperative period. Thus, there is limited research examining factors associated with long-term weight loss success for bariatric patients. Considering the weight regain that is reported in bariatric patients between 18 months to 2 years after surgery, this research seeks to identify the self-efficacy beliefs, social support, and lifestyle habits among women who are two or more years post bariatric surgery.

Background and Significance

The American Society of Bariatric Physicians (ASBP) reported that 33-40% of women and 20-24% of men in the United States are attempting to lose weight at any given time (Zhang & Wang, 2004), and for good reason: obesity is related to multiple conditions including sleep apnea, cancer, diabetes, hypertension, heart disease, and depression and contributes to 5 of the 10 leading causes of death in America (Haslam,

2007; Livingston, 2010). An individual weighing 20% above the ideal body weight is at increased risk for comorbidities that can lead to long-term chronic illnesses and even early death. Individuals with excess weight also encounter increased surgical risks, fertility problems, and difficulty completing daily chores (Hauner, 2001). Obesity is defined as having a body mass index (BMI; defined as weight in kilograms divided by the square of height in meters) of 30 kg/m² or greater, and there are classifications of obesity based upon BMI. A BMI of 30-34.9 kg/m² is considered high risk (Class I) for comorbidities, while a BMI of 35-39.9 kg/m² is considered very high risk (Class II) and a BMI > 40 kg/m² is extremely high risk for comorbidities (Class III; Haslam, 2007).

Due to the obesity health crisis, the medical community and especially those in the bariatric surgery field maintain that obesity surgery is the most effective way to experience and maintain significant weight loss. Bariatric surgery can offer significant, lasting weight loss for individuals (Buchwald & Williams, 2004), and more than 90% of patients who undergo the surgery lose more than 50% of body weight (Freeza, 2009). However, low adherence and slow results in lifestyle modification to reverse obesity have directly affected the steady increase in the number of weight loss surgeries performed nationwide (Aarts, Hinnen, Gerdes, Acherman, & Brandjes, 2014).

Individuals with a BMI greater than or equal to 45 kg/m² could be considered surgical candidates; patients with less severe obesity (BMI ≥ 35 kg/m²) could be considered if they had high-risk comorbidity conditions such as life-threatening cardiopulmonary or uncontrolled diabetes. Other indications for patients with BMIs between 35 and 40 kg/m² include obesity-induced physical problems interfering with lifestyle (for example, joint disease treatable but for obesity or body size problems

precluding or severely interfering with employment, family function, and ambulation; McCarthy, 2015). One of the major rationales for bariatric surgery is that the weight loss achieved by the surgery will lower the occurrence of these problems and the previously listed comorbidities (Pew Research Center, 2013).

There are two types of bariatric surgery described in the literature that allow weight loss to occur: malabsorptive and restrictive (Allison, Heshka, Mentore, Mentore, & Heymsfield, 2001; Mechanick et al., 2009; Rajeswaran, Shaikh, & Mohammad, 2013; Zhang & Wang, 2004). The malabsorptive type prevents the patient from absorbing nutrients ingested during meals, and the restrictive type produces satiety by limiting the amount of food intake the patient is able to ingest. Malabsorptive bariatric surgical procedures can be traced to the 1950s, when they were performed for the treatment of obesity and originally used with stomach cancer patients. The jejunoileal bypass bypassed most of the small intestine when the stomach cancer was removed. This surgery was primarily reserved for cases of morbid obesity (BMI >40 kg/m² or BMI > 35 kg/m²) with comorbid conditions such as type II diabetes and hypertension and caused severe protein malnutrition and other complications (Bauchowitz, Gonder-Frederick, & Olbrisch, 2005). By the 1970s, restrictive procedures began by means of stomach stapling.

In 1996, approximately 20,000 weight loss surgeries were performed in the United States. That number climbed in 2003 to more than 100,000 (Foust, Pham, Burke, & Gordon, 2006). Currently, about 220,000 bariatric surgeries are performed each year (American Society for Metabolic and Behavioral Services and Bariatric Surgery, 2011). The American Dietetic Association published a position paper in favor of bariatric

surgery as the “most effective” approach for weight management for obese individuals (2009, p. 340), and while the number of surgeries has significantly increased in the last two decades, bariatric surgery is no ‘magic bullet.’ Many bariatric surgery patients find that changing long-standing lifestyle habits is a serious challenge, and unfortunately, many ultimately experience weight regain due to noncompliance. More research is needed to identify lifestyle strategies used to support long-term weight loss outcomes.

Statement of the Problem

Weight regain is observed as early as 18 months to 2 years after bariatric surgery, although long-term weight maintenance is greater than that reported with purely gastric restrictive procedures (Rickers & McSherry, 2012). Although bariatric surgery appears to produce success immediately after surgery, the weight regain over time in this population cannot be ignored. Patients face more challenges sustaining the dramatic lifestyle changes required to ensure positive long-term weight loss outcomes. There is a lack of research regarding long-term outcomes, self-efficacy, health promotion, and social support particularly among women post bariatric surgery. There is no consensus in the literature with regard to long-term weight regain and follow up care (Mechanick et al., 2009).

Postoperative weight loss self-efficacy, dietary efficacy, healthy lifestyle habits, and social support may affect postoperative eating behavior. Several studies have suggested that patients struggle to adhere to the postoperative nutritional recommendations (Rajeswaran et al., 2013). Increased caloric consumption above patients’ postoperative caloric demands may contribute to suboptimal weight loss or weight regain post-surgery. Additionally, some patients may experience a return of disordered eating behaviors (Ballantyne, 2003).

Physiology of Weight Regain

It is possible that as time passes, the initial effective checks and balances in the system of control associated with bariatric surgery become diluted or forgotten, allowing the occurrence of physiological adaptation. There are numerous potential contributors to postoperative weight regain. Postoperative anatomic alternations such as enlargement of the gastric pouch or stoma dilation may facilitate greater consumption of food, limiting the initial restrictive benefit (Folope et al., 2007). The small bowel adapts to the physiological change and surgically-induced alterations in ghrelin, leptin, and incretin hormone levels may diminish over time. There may also be a diminishing intolerance of dietary sugar or fat intake, and some researchers have raised the possibility of a reflexive drop in resting energy metabolism with calorie restriction over time. Collectively, these changes undermine the imposed behavioral modification and as a result, individuals may see a return of poor or maladaptive eating habits—including emotional eating, habitual excessive dietary intake, poor nutritional choices, and grazing—ultimately leading to postoperative weight regain for many bariatric patients past the two-year postoperative period (Andrews, 1996).

Knowledge Gaps in the Research

The number of bariatric surgeries has increased exponentially since the mid-1990s, with approximately 220,000 operations performed in 2009 (Aguilera, 2014); yet, relatively limited research has been conducted regarding factors associated with long-term weight loss, dietary habits, usage of online social network support forums, and self-efficacy beliefs of bariatric patients. A significant percentage of postoperative bariatric patients (20-30%) experiences inadequate weight loss or sizable weight regain following

the procedure (Natvik, Gjengedal, & Raheim, 2013), and these failures are likely due to many factors including physiological changes, poor lifestyle changes, and patient behaviors and characteristics. There are gaps in the literature regarding long-term lifestyle modifications, social support, and self-efficacy in the bariatric population past the two-year postoperative period. While previous researchers have investigated the role of psychological factors in relation to obesity, few have investigated lifestyle, social support, and self-efficacy influencing long-term weight maintenance in the bariatric surgery population.

The Clinical Practice Guidelines (CPG) authored by Mechanick et al. (2009) provide comprehensive nutrient information for the immediate postoperative period; however, dietary guidelines do not discuss long-term nutritional guidelines and expectations. In fact, the CPG mention that physicians in general have not had formal nutrition training and therefore nutritional strategies should be reviewed and studied by interested physicians.

The Bariatric Society reports there is no consensus of the number of postoperative visits and length of time provided for follow-up care (Mechanick et al., 2009). The literature describes the need for a multidisciplinary approach in the postoperative phase from the physician and the healthcare provider who educates the patient on nutrition and the myriad psychosocial changes that may occur along with lifestyle and major body changes (Bauchowitz et al., 2005).

Significance of the Study

The research problems addressed in this study are weight regain, post-bariatric surgery lifestyle habits, self-efficacy, and social support. Research is needed to identify

the factors associated with successful long-term weight loss in women post bariatric surgery. Weight regain is observed as early as 18 months to 2 years after bariatric surgery. Weight regain after bariatric surgery is a complicated phenomenon poorly understood by even those healthcare providers and experts who work in the field (Dykstra, 2012). Long-term studies examining weight loss after bariatric surgery report that 20-30% of patients fail to reach typical postoperative weight loss and greater than 25% are unsuccessful in maintaining weight loss after 10 years (Stewart, Olbrisch, & Bean, 2010).

In the first two years following surgery, weight loss often stabilizes and a proportion of individuals begin to regain lost weight. Studies on the gastric bypass patient population reports regain between 5% and 50% of weight gain to an average regain of 23% of the overall weight lost (Lynch, 2016). Qualitative and quantitative studies of bariatric surgical outcomes report regain of weight and return of comorbidities along with the weight (Buchwald, Estok, & Fahrbach, 2009; Foust et al., 2006). In the immediate postoperative phase of bariatric surgery, it is not difficult for patients to achieve substantial weight loss (Bloomberg, Fleishman, Nalle, Herron, & Kini, 2010), but short-term weight loss after bariatric surgery justifies neither the costs nor the risks of surgery.

Bariatric surgical procedures have proven to improve a patient's quality of life and decrease existing comorbidities (Colquitt, Picot, Loveman, & Clegg, 2009). But surgery for obesity is not just a passive procedure; in order to see long-term sustained weight loss and to avoid complications with the surgery, the patient must make a lifelong commitment to a new lifestyle (Peacock & Zizzi, 2011; Woodward, 2003), including

making significant dietary and physical changes and developing personal beliefs and commitments required to sustain these lifestyle practices after surgery (Dykstra, 2012).

With increasing demands for bariatric surgery in correlation to the obesity epidemic and the health risks and comorbidities associated with obesity, there is a need to identify the factors that relate to long-term post-surgical weight management in the bariatric surgery population. Psychosocial predictors of bariatric surgery only started becoming more prevalent in the early 2000s. Researchers who conducted a literature review evaluating the relationship of psychosocial variables to postsurgical weight loss over a 10-year period found that the literature evaluating psychosocial variables as predictors of weight loss is conflicting and presents conflicting information in the literature (Van Hout, Verschure, & Van Heck, 2005). Food and meal times can be a significant challenge for the bariatric surgery patient who has chronically relied on eating as a source of comfort, distraction, or avoidance of emotions. Long-term monitoring for psychosocial triggers of unhealthy eating behaviors remains a necessary component of postoperative care. Emphasis on the development and implementation of non-food-related strategies for managing difficult or unpleasant emotions and life circumstances is essential (Doolen & Miller, 2005).

Perceived self-efficacy, which reflects the optimistic self-beliefs required to master tasks successfully (Fisher & Kridli, 2014), has been found to play a vital role in sustaining dietary changes (Schwarzer et al., 2010). Understanding the self-efficacy of dietary habits of bariatric surgery patients will provide direction in developing nutrition and cognitive behavioral strategies to promote long-term weight management for this population. Understanding the relationship of weight regain, self-efficacy in nutritional

practices, social support, and long-term weight loss outcomes will provide direction for the educational guidelines and practices involved in follow-up care.

Purpose of the Study

The purpose of this study is to examine the relationship among variables of weight regain, long term weight loss outcomes in women post bariatric surgery, lifestyle changes, self-efficacy, and social support. This knowledge could provide additional insight into recommended dietary habits and identify structured or prescribed methods of supporting the long-term weight loss success of bariatric patients.

Specific Research Questions

1. Is there a relationship between regain, long-term weight loss and demographical factors in women post bariatric surgery?
2. Is there a relationship between regain, long-term weight loss and weight self-efficacy in women post bariatric surgery?
3. Is there a relationship between regain, long-term weight loss, and lifestyle behaviors in women post bariatric surgery?
4. Is there a relationship between regain, long-term weight loss, and perceived social support in women post bariatric surgery?

Definitions of Terms

Bariatric Surgery

Bariatric surgery is the medical term for operations that promote weight loss by manipulating the gastrointestinal systems in the body (Doolen & Miller, 2005). In simplest terms, bariatric surgeries are intended to limit food intake (restrictive type), minimize caloric absorption (malabsorptive type), or both.

Roux-en-Y Gastric Bypass (RYGB)

The Roux-en-Y (RYGB) is a bariatric procedure designed for both restriction and malabsorption, and it is considered the gold standard of weight-loss surgery (Mechanick et al., 2009). RYGB is the most common type of weight-loss surgery worldwide and is considered permanent. In the procedure, the gastrointestinal tract is manipulated by bypassing the stomach and reconnecting it with the small intestine. The stomach is divided into two sections. The upper part is a small pouch that holds about 1-2 ounces of food initially. The pouch is connected to the jejunum using a Y-shaped limb of the small intestine bypassing the duodenum. Gastric and pancreatic secretions as well as bile mix with chyme at the juncture of the jejunum and the duodenum. This procedure permanently changes how food is digested, resulting in fewer absorbed calories and micro-nutrients (Colquitt et al., 2009).

With RYGB weight loss is dramatic because of the body's impaired ability to absorb nutrients. Usually 50% of excess weight loss (EWL) is seen in the first six months post-surgery, but weight loss may continue for up to two years (Freeza, 2009). As an added benefit of the rapid weight loss, health conditions affected by obesity such as diabetes, high blood pressure, high cholesterol, arthritis, sleep apnea, heartburn, and other conditions often improve quickly (Aguilera, 2014).

Vertical Sleeve Gastrectomy (VSG)

About 75-85% of the stomach is surgically removed in the irreversible VSG, which is performed generally through a laparoscopic procedure (Buchwald & Williams, 2004). What remains of the stomach is a narrow tube, or sleeve, which provides for the normal process of stomach-emptying while the pyloric valve remains intact. Although the

procedure restricts food intake, because the small intestine is unchanged (not shortened), VSG does not usually affect food absorption, so nutritional deficiencies are less of a problem than RYGB. The patient's appetite is reduced so that consuming very small amounts of food generate early and lasting feelings of satiety (Van Hout et al., 2005).

Laparoscopic Adjustable Gastric Banding (LAGB)

The most widely used restrictive procedure as of this writing is the LAGB, in which a band is placed around the upper part of the stomach, creating a small upper gastric pouch (typically holding 30 cc). The band forms an opening between the upper pouch and the remainder of the stomach. The inner surface of the band consists of a balloon that can be inflated with variable amounts of saline to alter the size of the opening. The band is attached to an injection port with a silastic tube and the port is implanted under the skin on the front of the abdominal wall. Adjustments of the stomach size can be made at any time after surgery during an office visit with the nurse practitioner or surgeon via the injection port using a needle (Freeza, 2009).

Body Mass Index (BMI)

BMI is an indicator of weight and obesity. BMI is calculated using a person's weight in pounds divided by his or her height in inches squared. This number is then multiplied by 703 (Rickers & McSherry, 2012). BMI categorizes weight as follows: below 18.5 = Underweight; 18.5-24.9 = Normal; 25.0-29.9 = Overweight; 30.0-39.9 = Obese; 40 and above = Morbidly Obese (Mechanick et al., 2009).

Obesity

Obesity may be defined as excessive accumulation of body fat and a chronic condition characterized by a slow, steady, progressive increase in body weight. The term

was previously defined as a weight higher than 30% above ideal body weight, but BMI is now considered more often as the measure of choice for obesity. Obesity is generally defined as having a body mass index (BMI) of at least 30 kg/m² (Haslam, 2007).

Weight Regain

Weight regain is defined in this study as weight increase of 15% from the lowest reported weight attained after bariatric surgery. Significant weight regain is often classified as regaining 15% of the total weight lost after bariatric surgery (Andrews, 1996). Regain is often attributed to poor adherence to postoperative dietary practices.

Long-Term Weight Loss

For the purpose of this research, *long term* is defined as a period of greater than 18 months post surgery. *Weight-loss* is defined as the measurement of weight or BMI greater than or equal to 50% of excess BMI lost after postoperative bariatric surgery (Geraci et al., 2014). The literature continues to present the issue of weight regain after a period of 18 months to 2 years (Brolin, 2002; Buchwald et al., 2009; Aguilera, 2014; (Mechanick et al., 2009).

Definition of Conceptual and Operational Variables

There are three independent variables explored in this research: self-efficacy, health promotion lifestyle, and social support. The dependent variable in this proposed study is weight regain. The demographic data collected in the study were used to describe the sample population and were excluded from the conceptual model. Table 1 summarizes the conceptual and operational definitions of the primary study variables.

Table 1

Conceptual and Operational Definitions of Primary Study Variables

Variable of Interest	Conceptual Definition	Operational Definition
Self-efficacy	An individual's confidence in their ability to change behaviors. Self-efficacy affects the amount of energy that an individual will expended and the extent to which the individual will persist despite adversity (Bandura, 1997).	Operationalized by using the Weight Efficacy Lifestyle Questionnaire (WELQ) to measure ability to resist eating in a variety of situations A 20-item self-reported instrument with a range of 0-9 for response options; higher scores indicate higher confidence. Five subscales are negative emotions (4 items), availability (4 items), social pressure (4 items), physical discomfort (4 items), and positive activities (4 items). Cronbach's alpha coefficients range from 0.70-0.90 (Clark, Abrams, Niaura, Eaton, & Rossi, 1991).
Health Promotion Lifestyle Habits	Health promotion behaviors (Walker, Sechrist, & Pender (1987) actions individuals take upon their environment to increase their level of health. Differs from health protection behaviors, which are intended to maintain health. The outcome of a behavior must have value and the person must believe performing the behavior will result in the expected desired outcome. In other words, individuals will not engage in certain behavior if the outcome is not important to them or they perceive the goals to be out of reach (Pender, 1996).	Lifestyle habits are operationalized by using the Health Promotion Lifestyle Profile II (HPLPII) developed by Walker, Sechrist, and Pender (1987). The 52-item questionnaire is a Likert-scale survey with six subscales: physical activity, stress management, spiritual growth, health responsibility, interpersonal relations, and nutrition. Cronbach's alpha for the total scale is .94 and for the subscales ranges from .79 to .87.
Social Support	The social resources persons perceive to be available or are actually provided by nonprofessionals in the context of formal support groups and informal helping relationships (Gottlieb & Bergen, 2010)	The Multidimensional Perceived Social Support Scale (MPSS) has 12-items and is used to assess the frequency/availability and adequacy of perceived social support from family and friends with reported internal reliability coefficient alphas for the scale from .81 to .90 (Zimet, Dahlem, Zimet, & Farley, 1988)

Conceptual Analysis

Self-Efficacy and the Social Cognitive Theory (SCT)

Bandura's social cognitive theory (SCT) best illustrates how cognitive belief structures and coping efforts can influence health behavior change, including adherence to medical regimens (Herriman, 2007). The SCT is composed of four processes of goal realization: self-observation, self-evaluation, self-reaction, and self-efficacy. These components are interrelated, each having an effect on personal mastery and motivation. The theoretical framework begins with an overview of SCT, belief structure, and spiritual coping followed by optimism and spiritual coping as constructs and finally, an explanation of how these two constructs may impact adherence (Bandura, 1997).

According to SCT, behavioral change is influenced by both the external environment and intrapersonal factors, which include self-efficacy, self-regulation, expectations, and emotional processes of the individual. The means by which a person copes with aspects of stress plays a pivotal role in psychological well-being amid challenging and stressful events. SCT developed over several decades from a theory for learning either intentionally or vicariously to an agent-oriented concept where self-development, adaptation, and change are influenced directly by the contributions a person makes to his or her life (Bandura, 1997).

Self-efficacy and motivation. Self-efficacy, an essential component of the concept of self-management, has been found to be one of the strongest predictors of a health promoting lifestyle. Self-efficacy refers to people's judgments about their capability to perform particular tasks, and it is believed to result from an interaction between personal, behavioral, and environmental factors. It includes perceived

confidence about the ability to utilize personal resources of motivation, cognition, and action to complete a given task. Thus, behavior change, responses, and adaptation are driven by the individual, their beliefs, and cognitive processes (Figure 1).

Figure 1. Bandura's self-efficacy model.

Similarly, motivation is a complex concept that includes the beliefs, values, and attitudes regarding the accomplishment of a desired behavior or behaviors (Fisher & Kridli, 2014). The importance of motivation in determining successful weight loss and maintenance has been established in several studies. Self-efficacy and motivation have been indicated as key predictors in the practice of health promotion activities. The SCT and cognitive-behavioral treatment approaches based on tenets of social cognitive theory suggest that using self-regulatory skills to control eating is a key predictor of success.

Social Support

The conceptual analysis for this study considers the perceived and direct effect of social support as it operates through the behavioral interventions of diet and exercise.

Social support is a variable in the context of health behaviors, either by directly

predicting health behaviors or by interacting with other health-related factors (Luszczynska, Gibbons, Piko, & Tekozel, 2004). Social support can also improve health outcomes indirectly through health-related mediators; for example, caring individuals in a person's circle may provide the encouragement and accountability needed to adopt positive health behaviors and overcome unhealthy behaviors. Similarly, having supportive relationships reduces stress and anxiety, thereby putting a person in a better state of mind to adopt healthy behaviors or eliminate harmful ones (Fernandez, Warner, Knoll, Montenegro, & Schwarzer, 2015).

Perceived social support is the anticipated support from an individual's social network that is available if needed. Received social support can be prompted directly in interventions, and it is thus a promising factor to be investigated in the nutritional change process (Fernandez et al., 2015; Figure 2). It is necessary to measure perceived social support specifically in the investigation of long-term weight loss outcomes in the bariatric patient. Behavior-specific social support may be particularly relevant in the process of goal setting.

Figure 2. Construct validity of multidimensional perceived social support scale.

Social support may be associated with increased weight loss after bariatric surgery (Livhits et al., 2010). One healthcare requirement in the immediate postoperative phase, as outlined in the Clinical Practice Guidelines (CPG), is to provide organized, supervised support groups with a licensed healthcare professional present at the meetings (Mechanick et al., 2009). Healthcare providers should consider having adequate ancillary support to prepare patients and help them cope with the dramatic lifestyle changes they will encounter postoperatively to optimize long-term outcomes. Support groups can provide consistent and standardized psychological, nutritional, and other support counseling for bariatric patients (Foust et al., 2006). It remains to be seen whether patients who attend support groups or have other forms of social support have greater weight loss after bariatric surgery (Livhits et al., 2010).

Health Promotion

Health promotion includes factors that affect behaviors that enhance and strengthen and personal relationships for a more fulfilling lifestyle. The concept differs from *health protection* in that health protection behaviors are directed toward maintaining health while health promotion behaviors are directed toward increasing the level of health (Pender, 1987). Pender (1987) believed health promotion behaviors were actions individuals take upon their environment to move to higher levels of health. Her model is divided into two phases: the decision-making phase and the action phase. Pender described cognitive-perceptual and modifying factors in the two phases that impinged upon or affected the likelihood of the individual performing health promotion behaviors. Individual perceptions were seen as crucial in the decision-making process. Perceptions were the result of an evaluative process in which the individual assesses him/herself

against a standard of behavior or value of importance. The resultant evaluation affected the individual's self-concept and self-esteem (Figure 3).

Individual Characteristics and Experiences	Behavior-Specific Cognitions and Affect	Behavioral Outcomes
<ul style="list-style-type: none"> • Prior related behavior • Personal factors: biological, psychological, sociocultural 	<ul style="list-style-type: none"> • Perceived benefits of actions • Perceived barriers to actions • Perceived self-efficacy • Activity-related affect • Interpersonal influences: (family, peers, providers); norms, support, models • Situational influences: options, demand characteristics, aesthetics 	<ul style="list-style-type: none"> • Immediate competing demands (low control) and preferences (high control) • Commitment to a plan of action • Health promoting behavior

Figure 3. Pender's health promotion model.

Pender (1987) identified interpersonal influences as interaction with others, expectations of significant others, and interactions with health professionals. The availability of support from others is important in encouraging behaviors that allow individuals to choose behaviors that support health. Although self-esteem is considered a modifying factor that impinges upon participation in health promotion, Pender (1987) emphasized the limited empirical evidence that self-esteem affects participation in health promotion behaviors. The health promotion model provides a framework for the development of innovative population-specific models and is considered consistent with SCT as defined by Bandura (1997). Pender's construct of behavior-specific cognitions and affect is consistent with the concept of self-efficacy as defined by Bandura (1997).

Conceptual Research Model

For this research study, the demographic variables are used to describe the sample population. The dependent variable is the weight regain and the long-term weight

outcomes post 18 months to 2 years after bariatric surgery. Pictured in Figure 4 is the visual representation of the conceptual model utilized in this study.

Figure 4. The conceptual research model.

Summary

This chapter identified the problem and significance studying the variables possibly related to long-term weight loss and weight regain in women post bariatric surgery. The research conceptual model includes the Weight Efficacy Lifestyle Questionnaire (WELQ) seeking to measure the ability to resist eating in a variety of situations (Clark, Abrams, Niaura, Eaton, & Rossi, 1991), the Health Promoting Lifestyle Profile (HPLP-II) seeking to identify lifestyle behaviors and habits formed (Pender, 1987), and the Multidimensional Perceived Social Support Scale (MSPSS) seeking to identify a person's perceived social support from friends, family, or significant others (Zimet, Dahlem, Zimet & Farley, 1988).

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter gives a comprehensive overview of the current state of research on long-term weight loss and weight regain in the bariatric patient population. There is limited research on bariatric post-surgical regain and long-term weight loss outcomes, as studies do not extend past the immediate postoperative or one-year postoperative period. The existing research on bariatric surgery reports weight regain in bariatric patients between 18 months to 2 years after surgery.

Obesity in the United States is an ever-increasing epidemic. In 2010, 34% of US adults were classified as obese (Ogden et al., 2014). Currently, medical costs to treat preventable obesity-related diseases are estimated at \$210 billion annually (Finkelstein, Trogon, Cohen, & Dietz, 2009). Further, compared to individuals of healthy weight, obese individuals show a 50% increase in per capita medical spending and 80% more on prescription drugs. Thus, finding a solution for this epidemic is important not only for overall health but also from an economic standpoint (Nardulli, 2012).

Despite the number and cost of bariatric surgical procedures performed, evidence of long-term weight loss success has not been clearly and consistently demonstrated. Buchwald et al. (2004) conducted a systematic review and meta-analysis of 136 studies that included 5 randomized controlled trials (RCTs) to determine the impact of bariatric

surgery on weight loss, operative mortality outcomes, and selected obesity comorbidities. Their findings indicated effective weight loss and substantial resolution of diabetes, hyperlipidemia, hypertension, and obstructive sleep apnea were realized for a large proportion of patients; however, among the RCTs, the duration of follow-up for nearly half of the studies was 6 months and ranged to only 36 months, which limits the ability to draw long-term conclusions (Ogden, Clementi, Aylwin, & Patel, 2005).

According to guidelines published by Mechanick et al. (2009), bariatric surgery is recommended for individuals who have a BMI > 35 kg/m². Postoperative bariatric surgery is where the ‘hard work’ begins; it includes behavioral changes related to diet and physical activity and lifelong behavior modification in order to sustain the weight loss outcomes (Jumbe, Bartlett, Jumbe, & Meyrick, 2016).

Weight Regain

A review of the literature by confirmed that bariatric surgery, both restrictive and malabsorption procedures, led to a greater percentage of weight reduction compared to non-surgical methods. Two years following surgery, the mean weight loss was 20% of excess weight for surgical patients, compared to 1.4% of initial weight loss for non-surgical patients. At 12 months following surgery, gastric bypass patients realized a weight loss of 62-78% of their excess weight while vertical-banded patients realized a 43-63% of their excess weight (Aguilera, 2014).

Livhits et al. (2010) found that between 1999 and 2002, 33.5% of the subjects regained their weight 12 months after surgery while 58.9% maintained their weight. Specifically, the study identified being sedentary as a primary factor associated with those who regained their weight. Psychosocial or emotional factors were not investigated;

however, Boeka, Prentice-Dunn, and Lokken (2010) identified well-being as a predictive factor associated with weight regain following bariatric surgery.

A 10-year study examining failure rates among laparoscopic gastric-banded patients identified a 13.2% failure rate at 18 months following surgery and a 40% failure rate at 5 years following surgery (Boeka et al., 2010). A Swedish study reported patients who underwent the purely restrictive laparoscopic adjustable gastric banding (LAGB) procedure or the restrictive and malabsorptive Roux-en-Y Gastric Bypass (RYGB) procedure began to regain weight between the first and second postoperative year (Sjostrom et al., 2004). Ten years postoperatively, approximately 10% of patients who underwent RYGB and 25% of patients who underwent LAGB failed to maintain at least a 5% reduction in their initial weight. In addition, the rate of improvement/resolution of comorbidities such as diabetes, hypertension, and high cholesterol was less impressive after 10 years than at the 2-year point, possibly due to weight regain over time (Lynch, 2016). Bariatric surgery is a tool to be used alongside behavior modification in order to achieve long-term weight loss, and it is possible that difficulties with nutrition, dietary habits, and lifestyle behaviors are responsible for regain after bariatric surgery. Whether these behaviors were present before bariatric surgery or developed in the long-term remains unclear.

Long-Term Weight Loss Outcomes

For bariatric surgical patients, the percentage and rate of weight regain is significantly low but still occurs for an estimated 20% of the population (Folope et al., 2007). In an effort to promote long-term weight loss maintenance, the American Society for Metabolic and Bariatric Surgery (ASMBS) and Surgical Review Corporation (SRC)

created the accredited Center of Excellence in Metabolic and Bariatric Surgery program (COEMBS; SRC, 2018). The COEMBS program requires bariatric surgeons and facilities to provide nutrition education at each follow-up visit, clinician-operated support groups, and group physical activity programs.

Well-rounded support following bariatric surgery is known to be necessary for patients to maintain weight loss; however, the timing and types of support have been understudied (Buchwald & Williams, 2004). For instance, while success after bariatric surgery is often attributed in part to regular follow-up with a bariatric team, it is unclear who benefits from support groups and how long individuals should attend these groups to maximize their outcomes (Ballantyne, 2003). In a qualitative study researching perspectives on regain in vertical sleeve gastrectomy bariatric surgery patients, the most predominant emergent theme was that participants wanted more follow-up care. Seventy-four percent of participants reported either that there was not enough support provided or that more support was needed (Lauti, Stevenson, Hill, & MacCormick, 2016).

Patients who undergo bariatric surgery are typically recommended to return to the bariatric surgery program for follow-up at least every six months in the first two postoperative years and annually thereafter. Adjustments of a gastric band can require follow-up appointments as often as every four to six weeks in the first postoperative year and every three months through the first three postoperative years (although no protocol for band adjustments has been widely accepted; Mechanick et al., 2009). Frequent postoperative visits can be used to monitor patients' weight loss and counsel them on issues related to dietary adherence and eating behaviors, which often require reinforcement after surgery (Madden & Tichansky, 2005).

Although intention to adhere to follow-up recommendations is discussed throughout the screening process, postoperative follow-up is frequently neglected and inadequate follow-up has been found to negatively affect weight loss, even within the first postoperative year (Madden & Tichansky, 2005; Stewart, Olbrisch, & Bean, 2010). Van Hout et al. (2005) reported that only 40% of patients returned for each of their first four annual follow-up visits with the bariatric surgeon. The researchers found that patients who adhered to their follow-up schedule and regularly participated in a monthly support group lost significantly more weight than those patients who did not.

Clinical Practice Guidelines

Bariatric perioperative Clinical Practice Guidelines (CPG) for surgery are endorsed and cosponsored by the American Association of Clinical Endocrinologists (AACE), The Obesity Society (TOS), American Society for Metabolic & Bariatric Surgery (ASMBS), and the American Society for Parenteral & Enteral Nutrition (ASPEN; Mechanick et al., 2009). The minimum surgical requirements set forth by the National Institutes of Health (1992) are that an individual is 100 pounds or more overweight with a BMI of 40 kg/m² and above or a BMI of 35 kg/m² and above with one or more obesity-related comorbidities (Buchwald et al., 2004). Contraindications for bariatric surgery include congestive heart failure or unstable angina, active substance abuse, or psychopathological conditions. Patients with learning difficulties who are unable to understand the lifelong changes required to maintain an acceptable level of health practices should not be considered (Mechanick et al., 2009).

Postsurgical outcomes are found to be dependent on the specific bariatric surgery procedure and nonsurgical factors such as patients' ability to implement and adhere to

recommended lifestyle changes, particularly eating habits and physical activity.

Permanent results following bariatric surgery require new lifestyle management skills and behaviors. Bariatric surgery patients must be prepared to replace pre-surgical abnormal eating with healthy behaviors and commit to lifelong behavior changes and dietary choices, as these are paramount in supporting successful weight loss. In general, bariatric surgery patients should adhere to recommendations for a healthful lifestyle, including increased consumption of fresh fruits and vegetables, limitation of foods high in saturated fats, reduction of stress, and participation in at least 30 minutes of exercise a day to achieve optimal body weight (Buchwald & Williams, 2004).

Dietary Habits and Weight Regain in Bariatric Patients

According to Leahy and Lunig (2015), nutrition education is a standard of care. The importance of nutrition education for bariatric surgery patients' post-surgical success has been well documented in the bariatric literature (Harbottle, 2011). Borges, Alvarez-Leite, and Correia (2012) utilized a dietary recall and Food Frequency Questionnaire to assess nutrition follow-up as a determinant of weight regain after RYGB. The majority of the 100 patients assessed were women (84%), and patients' mean estimated weight loss was ($59.1 \pm 20.3\%$). Weight regain was seen in 56% of patients with 29% having regained over 10.1% of the minimum weight reached after RYGB. Weight regain increased significantly with time after surgery (up to 2 years: 14.7%; from 2 to 5 years: 69.7%; over 5 years: 84.8%). Poor diet quality characterized by excessive intake of calories, snacks, and sugary and fatty foods was statistically higher in those that regained the weight. Sedentary lifestyle and lack of nutritional counseling follow-up were also significantly associated with regaining the weight (Freire et al., 2012).

A study of Hispanic Americans that were provided a postoperative comprehensive nutrition education program following the RYGB found increased excess weight loss compared to those that did not receive this intervention (Nijamkin et al., 2012). Taube-Schiff et al. (2016) found that providing postoperative dietary counseling helped bariatric surgery patients adhere to eating behaviors that aid in long-term weight loss maintenance. The researchers administered a nutrition knowledge questionnaire, *Eating After Bariatric Surgery*, prior to and one month following bariatric surgery. Analysis of the data revealed (a) patients' nutrition knowledge significantly increased from the preoperative phase ($M=46.9$; $SD=14.4$) to the postoperative phase ($M=56.9$; $SD=14.1$, $t[118]=-8.01$, $p<.001$); (b) time between the nutrition education class and patients' surgery significantly impacted knowledge retained; (c) patients with higher preoperative levels of depression and anxiety had significantly lower postoperative nutrition knowledge; and (d) there were gender differences in patients' nutrition knowledge.

Many bariatric surgery programs offer nutrition education during the preoperative phase, and gaining an initial understanding of what happens to this knowledge in the early postoperative phase is an important first step in better understanding the trajectory of knowledge over time. However, the optimal timing for bariatric patients to receive nutrition education has not been established in the literature (Taube-Schiff et al., 2016). According to the guidelines published by the ASMBS, bariatric patients should undergo an appropriate nutritional evaluation, including micronutrient measurements, before any bariatric surgical procedure. Furthermore, guidelines suggest bariatric patients should undergo evaluation of their ability to incorporate nutritional and behavioral changes before and after bariatric surgery. Bariatric surgery paired with healthy eating

behaviors/food choices and exercise is frequently cited in the literature as influencing positive weight loss outcomes, but this presents an incomplete picture, as the influence of psychological characteristics on weight loss outcome is much less clearly understood (Harbottle, 2011).

Social Support for Bariatric Patients

There is evidence to suggest social support promotes positive surgery experiences and outcomes for bariatric patients. In quantitative work, perceptions of social support in general have been linked to increased satisfaction with bariatric surgery outcomes (Livhits et al., 2010). The patient who has support from others, strong interpersonal relationships, and healthy family functioning is likely to comply with postoperative guidelines and have a better outcome from surgery (Aguilera, 2014). Integrating social media into weight loss interventions through online social support platforms is an emerging area in behavioral research (Dahl, Hales, Turner, & McGrievy, 2016). Although several studies have examined the effectiveness of online social network intervention programs for alcohol and drug use, only a few have examined those aimed specifically at nutrition and physical activity behaviors or weight loss (Aguilera, 2014). There is a lack of literature regarding the direct influence of social support via online media on weight loss behaviors much less weight loss behaviors in the bariatric patient (Dahl et al., 2016).

A qualitative study reporting research on in-depth interviews (n=13) on social support for women that have undergone bariatric surgery provides valuable insight into the role a *supporter* plays in the postoperative phase of a patient's journey. Supporters (a) guided participants' behavior by serving as role models and providing information that

could be invoked to make decisions and solve problems; (b) assuaged participants' concerns and enhanced their sense of mattering and self-esteem by providing demonstrations of empathy, understanding, valuing, and caring; (c) relieved participants of day-to-day responsibilities during stressful periods by offering instrumental aid; and (d) provided companionship for and inspired participants to forge ahead in their journeys toward improved health and fitness by serving as joint collaborators (Ogle, Park, Damhorst, & Bradley, 2016).

In a study of depressive symptoms and weight loss in bariatric surgery patients, Aguilera (2014) reported a significant reduction in depressive symptoms in the intervention group compared to the relative group who received standard care at a follow-up of 12 months after surgery. The intervention group lost 80% of their preoperative estimated weight loss compared with the control group, which lost 64%. Aguilera found that estimated weight loss and changes in Beck's Depression Inventory scores were positively and significantly correlated, and there was a significant positive relationship between improvement of the intervention's group depressive mood, the amount of excess weight they lost, and their attendance of a support group.

In addition to contributing to weight loss, social support may help prevent relapses among those who have successfully trimmed pounds. Social support and weight loss were researched in patients who reported losing more than 20% of their body weight at some point in the past. The research classified participants as either 'maintainers' (those who sustained the 20% loss for two years or more), those who regained the weight, and those who gained the weight back one or more times (Livhits et al., 2010). Those who regained the weight not only had less available social support, but they also utilized

their social networks less effectively than maintainers. Moreover, individual assessments showed that maintainers had more sophisticated coping and emotional skills than those who regained weight. The authors postulated that social support may act as a buffer to stress among maintainers. It is also possible, however, that those with greater emotional resilience are more successful in building strong social relationships (Livhits et al., 2010).

CHAPTER 3

METHODS

This quantitative study is intended to explore the relationships between self-efficacy, health promotion lifestyle habits, social support, and long-term weight loss outcomes among women post bariatric surgery. A timeframe of 18 months or more post bariatric surgery is used for assessing long-term weight loss outcomes. This knowledge could provide additional insight into dietary habits and identify structured or prescribed methods of supporting the long-term weight loss success of the bariatric patient.

This chapter includes a description of the population and proposed setting, data collection instruments, measurement methods, and procedures, and the plan for data analysis and ethical considerations. Also included is a discussion of the research methodology used to determine associations between three predictor variables as the independent variables: demographic data, self-efficacy, health promotion lifestyle habits, and social support in women post bariatric surgery (the dependent variable is the long-term period of two years or more and weight regain). Lastly, this chapter describes the instruments and data analysis that will be used to identify any associations (Polit & Beck, 2012).

Research Design

This is a non-experimental study using a descriptive, cross-sectional correlational design. Descriptive studies examine one or more characteristics of a population and although there may be research on the variables, the research may not have focused on the population of bariatric patients with 18 months or more of postoperative experience. A cross-sectional research design quantifies identified variables collected at a single point in time that may not have been examined for inter-relationships in identified sample populations. Descriptive correlational research seeks to examine the relationships between demographics, self-efficacy, health promotion lifestyle, social support, regain, and long-term weight loss; it does not establish causality (Polit & Beck, 2012).

The research is designed to attempt to describe the variables from a patient's perspective as possible influencing factors related to long-term weight loss outcomes and weight regain post bariatric surgery. Numerical data was collected through the use of valid and reliable survey instruments to identify and describe potential relationships between the independent and dependent variables. The data will be manipulated during statistical analysis to describe phenomena and to assess the magnitude and reliability of the relationships among them (Polit & Beck, 2012).

Description of the Sample

The participants for this study were selected through a convenience sample of adult women who were a minimum of 18 months or more post bariatric surgery. The minimum 18-month timeframe was chosen to align with the literature that identifies 18 months to 2 years as the long-term weight loss period where patients begin to regain the weight that was originally lost (Lynch, 2016).

The inclusion criteria for study participation were

- Adults age 18 years and older
- Female
- Able to read and write English
- Internet users with computer literacy
- Underwent a bariatric surgery procedure with greater than eighteen months or more postoperative time

The exclusion criteria for study participation were

- Male
- History of having more than one bariatric surgical procedure (a repeat or revision of the original procedure)
- Health-related hospitalization within the past two years other than the bariatric surgery

Recruitment

The sample was recruited entirely online over a four-week timeframe from the internet-based Obesity Help Forum and the Women's Health Only Facebook Forum. The Obesity Help Forum has over 60,000 registered members and the Women's Health Only Facebook Forum has over 650 registered members. Both forums have a discussion board platform, active online participation, and interactive support systems that make up an 'online community.'

Sample Size

The minimum sample size was determined by power and effect size. Power reflects the probability that the statistical test will result in rejecting the null hypothesis

(Polit & Beck, 2012). Polit and Beck (2012) recommend a power of 0.80 for behavioral sciences research, which generally utilizes a moderate effect size. The R 3.4.3 GUI 1.70 El Capitan build (7463) power analysis software was used to determine the number of participants for this study using categorical and continuous variables. An *a priori* power analysis indicated a sample of 88 participants would be needed to detect a moderate effect size with a 95% power using a *t* test between the means with alpha set at a 0.05 level of significance.

Data Collection Procedures

Approvals were obtained from the University of San Diego's Institutional Review Board. Data were collected entirely online through the web-based survey platform SurveyMonkey. A recruitment email was placed on the Facebook and Obesity Help forums with a link inviting recipients to participate in the study. Participants were informed in invitation email of the researcher's contact information, the purpose of the study, the approximate time it takes to complete the survey, and the risks involved in participating in the study. Participants who met the inclusion criteria received a link to the study. Participants were assured their personal information would remain confidential and the study introduction letter defined the participant informed consent. Participants that proceeded to click the link and participate were notified in the link they could download a copy for their personal records. Informed consent was confirmed through the participants' willingness to click on the link to begin the study.

Instrumentation

There were four sections included in the SurveyMonkey questionnaire. The researcher created a non-standard demographic questionnaire for the first section of the questionnaire. The remaining three sections utilized three standardized measures: Weight Efficacy Lifestyle questionnaire, Health Promotion Lifestyle Profile II, and the Multidimensional Perceived Social Support Scale.

Demographic Questionnaire

The demographic questionnaire contained three main sections. The first section asked for participants' location of residence, age, current weight, height, race/ethnicity, level of education, marital status, number of members residing in the household, employment status, and annual household income. The second section asked for surgery and weight information, while the third section asked for details about regain, long-term weight loss, and nutrition education.

Surgery and Weight Questions

Participants were also asked questions designed to collect information about their bariatric surgery experiences, including

1. What was the date of your bariatric surgery?
2. What type of bariatric surgery did you have?
3. What was your highest known weight before surgery?
4. What was your highest known weight after surgery?
5. Check any chronic illnesses you had before bariatric surgery (check all that apply): diabetes, high blood pressure, high cholesterol, arthritis, gout, and or any

joint inflammatory disease, depression, anxiety, sleep apnea, fatty liver or elevated liver enzymes (blood work), other (please specify).

Regain, Long-Term Weight Loss, and Nutrition Education Questions

Participants answered five questions about their nutrition education and long-term weight loss outcomes:

1. Do you use the Internet for weight loss support? If so, please list the forums used (check all that apply): Obesity Help, Facebook, Instagram
2. Did you receive any nutrition education before surgery? If so, what type of format (check all that apply): classroom, group or individual education, printed information pamphlet, printed book, website, other (please specify).
3. Did you receive nutrition education after surgery? If so, what type of format (check all that apply): classroom, group or individual education, printed information pamphlet, printed book, website, other (please specify).
4. Are you currently taking any medications? If so, please list.
5. Do you participate in any lifestyle or weight management programs? If so please (check all that apply and) list: Weight Watchers Program, Jenny Craig Program, NutriSystem Program, Ketogenic Lifestyle, Intermittent Fasting Lifestyle, Low-Carbohydrate Lifestyle, Plant-based Lifestyle, Vegan or Vegetarian Lifestyle, Counting Macronutrients Lifestyle, MyFitnessPal Tracking Program, other (please specify).

Weight Efficacy Lifestyle Questionnaire (WELQ)

The Weight Efficacy Lifestyle Questionnaire (WELQ) was used to measure diet self-efficacy for weight control. This instrument enabled the investigator to assess

participants' confidence to resist eating in different situations (Clark et al., 1991). The 20-item, five-subscale instrument has response options ranging from 0 to 9, with higher scores indicating higher confidence. The total WELQ score range is 0-180, with 0-36 possible for each subscale score. The five subscales are negative emotion (4 items), availability (4 items), social pressure (4 items), physical discomfort (4 items), and positive activities (4 items). The psychometric properties of the WELQ have been well documented and established with Cronbach's alpha coefficients ranging from 0.70-0.90 in a previous similar study (Clark et al., 1991). Cronbach's alpha was also measured in this study.

Health Promoting Lifestyle Profile (HPLP-II)

The Health Promoting Lifestyle Profile (HPLP-II) was used to measure participants' levels of health-promoting behaviors (Choo & Kang, 2015). This 52-item instrument asks participants to indicate the frequency with which they engage in each behavior on a 4-point Likert scale (1 = "never", 4 = "routinely"). The HPLP-II contains six subscales: spiritual growth, health responsibility, physical activity, nutrition, interpersonal relations, and stress management. Higher scores on the scale indicate levels of health-promoting behaviors. The Cronbach's alpha coefficients for the total score for a similar study in a community-based sample of obese women were reported as 0.88-0.90 (Choo & Kang, 2015). The Cronbach's alpha was also measured in this study.

Multidimensional Perceived Social Support (MPSS) Scale

The Multidimensional Perceived Social Support Scale (MPSS) is a 12-item instrument rated using a 7-point Likert scale (1 = "very strongly disagree", 7 = "very strongly agree") to measure perceived social support from friends, family or significant

others. The instrument is scored by adding the item ratings with a high score indicating high perceived social support. Scores can range from 12 to 84. The MPSS is a reliable and valid instrument (Wu et al., 2013) with a reported Cronbach's alpha of 0.85 in a similar study.

CHAPTER 4

RESULTS

The results are presented in two sections. The first section contains the descriptive analysis of the participants' demographic data and any relationship to regain and reports other questions aimed to gather more information on the convenience sample. The second section provides the results of the four research questions and includes a descriptive analysis of the study variables (weight efficacy, health promotion, social support and any relationship to the dependent variable of regain).

Participants that met the study inclusion criteria (female adult age 18 years and older, able to read and write English, Internet users with computer literacy, underwent bariatric surgery with greater than 18 months or more postoperative time) were recruited from a bariatric surgery Facebook page, the Obesity Help website. For the purposes of aligning the data with the dependent variable of regain, only those participants that reported regain were included. There were 253 participant attempts reported in the SurveyMonkey web-based platform; of those, 135 participants completed the survey in its entirety and 123/135 reported regain.

Descriptive statistics analyzing frequencies were used for the demographic data. Age, current weight, height, race/ethnicity, level of education, marital status, number of members residing in the household, employment status, and annual household income were reported. The dependent variable weight regain is reported, as is weight regain across surgery type. Participants' responses to questions of their use of online Internet weight loss support, nutrition education before and after surgery, and participation in a weight or lifestyle management program are reported in section two.

Section 1: Description of the Sample and Demographic Factors

A total of 123/135 (91.1%) participants reported a regain in weight and 12/135 (8.8%) reported no weight regain. The regain ranged from a 1-pound weight gain through a 79-pound weight gain. Regain was calculated by taking the current weight reported and subtracting the lowest weight reported post-surgery on the demographic section.

Descriptive statistics were used to compare the demographic data of the women.

Table 2 compares weight regain by surgery type. Out of 123 total participants, 74 (60.2%) reported having undergone the Vertical Sleeve Gastrectomy surgery, while 40 (32.5%) underwent the RYGB gastric bypass surgery, 8 (6.5%) underwent the LABG lap-band surgery, and 1 (0.8%) reported 'Other.'

Table 2

Comparison across Surgery Types (among participants reporting regain)

Total n = 123	RYGB n=40	VSG n=74	LAGB n=8	Other n=1
	32.5%	60.2%	6.5%	0.8 %
	(40/123)	(74/123)	(8/123)	(1/123)

Next, participants' weight regain and demographic factors (household members, race/ethnicity, level of education, relationship status, employment status, and household income) were compared by regain or no regain. The mean weight regained was 20.93 pounds (SD 16.47) and mean height was 64.54 centimeters (SD 2.835).

Participants' ages were collected using categorical values. Of 122/123 participants that reported age, 8 (6%) were 25 to 34 years old, 37 (30%) were 35 to 44 years old, 48 (39%) were 55 to 64 years old, 4 (3%) were 65 to 74 years old, and 1 (<1%) was over 75 years old.

Of the 108/123 participants that responded to the question of race/ethnicity, 2 (1.6%) identified as American Indian or Alaskan Native, 13 (10.6%) identified as Black or African American, 89 (72.4%) identified as White or Caucasian, and 4 (3.3%) reported being of multiple ethnicities. Of those identifying multiple ethnicities, 1 reported half White and half Asian, 1 reported American Indian/Polish, 1 reported East Asian and Western European American, and 1 reported Hispanic Croatian.

All 123 participants responded to the question regarding number of members in the household. Of those, 11 (8.9%) reported one-member household, 35 (28.5%) reported two-member household, 32 (26%) reported three-member household, 24 (19.5%) reported four-member household, 13 (10.6%) reported five-member household, 3 (2.4%) reported six-member household, and 5 (11.4%) reported seven or more members in the household.

All participants (n=123) responded to the question regarding relationship status. There were 88 participants (71.5%) that reported being married, 3 (2.4%) were widowed, 14 (11.4%) were divorced, 1 (0.8%) was separated, 1 (0.8%) was in a domestic partnership, 11 (8.9%) were single but cohabiting with a significant other, and 5 (4.1%) were single never married.

All participants (n=123) responded to the question regarding employment status. Seventy-four participants (60.2%) reported full-time employment, 8 (6.5%) were employed part-time, 6 (4.9%) were not employed/looking for work, 13 (10.6%) were not employed/not looking for work, 16 (13%) were retired, and 6 (4.9%) reported disabled/not able to work.

All participants (n=123) reported a household income range: 4 participants (11.32%) reported income between \$0 and \$24,999, 12 (11.97%) reported \$25,000 to \$49,999, 26 (21.13%) reported \$50,000 to \$74,999, 28 (22.76%) reported \$100,000 to \$124,000, 12 (11.97%) reported \$125,000 to \$149,999, 8 (11.65%) reported \$150,000 to \$174,999, 5 (11.4%) reported \$175,000 to \$199,999 and 7 (11.57%) reported \$200,000 and up.

Table 3

*Height, Weight, and Demographic Factors Related to Regain**

Covariates	Range n=123	Mean n=123	SD	p-value
Height in Centimeters	58-71	64.54	2.835	.132
Weight Regain in Pounds	1-79	20.93	16.47	
Age				.860
18-24	0	0%		
25-34	8	6.5%		
35-44	37	30.1%		
45-54	48	39.0%		
55-64	24	19.5%		
65-74	4	3.3%		
75 and up	1	0.8%		
Race/Ethnicity				.060
American Indian or Alaskan Native	2	1.6%		
Asian / Pacific Islander	1	0.8%		
Black or African American	13	10.6%		
Hispanic	14	11.4%		
White/Caucasian	89	72.4%		
Multiple Ethnicity / Other	4	3.3%		
# Household Members				.546

1	11	8.9%	
2	35	28.5%	
3	32	26%	
4	24	19.5%	
5	13	10.6%	
6	3	2.4%	
7	2	1.6%	
8	2	1.6%	
Relationship Status			.998
Married	88	71.5%	
Widowed	3	2.4%	
Divorced	14	11.4%	
Separated	1	0.1%	
In a domestic partnership or civil union	1	0.1%	
Single, but cohabiting with a significant other	11	8.9%	
Single, never married	5	4.0%	
Employment			.172
Employed, working full-time	74	60.2%	
Employed, working part-time	8	6.5%	
Not employed, looking for work	13	10.7%	
Not employed, Not looking for work	13	10.7%	
Retired			
Disabled, not able to work	6	5%	
Household Income			.546
\$0-\$24,999	4	11.32%	
\$25,000-\$49,999	12	11.97%	
\$50,000-\$74,999	26	21.13%	
\$75,000-\$99,999	21	17.07%	
\$100,000-\$124,999	28	22.76%	
\$125,000-\$149,999	12	11.97%	
\$150,000-\$174,999	8	11.65%	
\$175,000-\$199,999	5	11.4%	
\$200,000 and up	7	11.57%	

***Note:** Regain = (Current weight – Lowest weight post-surgery)

Table 4 reports regain in the categorical items created to identify long-term weight

outcomes through the use of the Internet, various weight loss support groups, nutrition education, lifestyle, and weight management programs. The most frequently reported

Internet site used was Facebook (94; 74.8%). The most frequently reported type of nutrition education before surgery was classroom, group, or individual education (88; 71.5%). The most frequently reported form of nutrition education after surgery was classroom, group, or individual education (59; 48%).

Table 4

Use of Internet for Weight Loss Support, Nutrition Education, Lifestyle, and Weight Management Programs

Covariates	Frequency n=123	Percent % n=123
Do you use the Internet for weight loss support?		
Obesity Help	34/123	27.6%
Facebook	92/123	74.8%
Instagram	47/123	38.2%
Did you receive any nutrition education before surgery?		
Classroom, group or individual education	88/123	71.5%
Printed informational pamphlet	67/123	54.5%
Printed book	22/123	17.9%
Website	20/123	16.3%
Did you receive any nutrition education after surgery?		
Classroom, group or individual education	59/123	48.0%
Printed informational pamphlet	48/123	39.0%
Printed book	16/123	13.0%
Website	26/123	21.1%
Covariates	Frequency n=123	Percent % n=123
Do you participate in any lifestyle or weight management programs?		
Weight Watchers	7/123	5.7%
Jenny Craig		

Weight Loss Clinic	1/123	0.08%
NutriSystem	0/123	0.0%
Ketogenic Lifestyle	24/123	19.5%
Intermittent Fasting Lifestyle	10/123	8.1%
Low-Carbohydrate Lifestyle	42/123	34.1%
Plant-based Lifestyle	6/123	4.9%
Vegan or Vegetarian Lifestyle	2/123	1.6%
Counting Macronutrients Lifestyle	15/123	12.2%
MyFitnessPal Tracking	55/123	44.7%

Section 2: Results of the Research Questions

The specific research questions guiding this research were:

1. Is there a relationship between long-term weight regain and demographical factors in women post bariatric surgery?
2. Is there a relationship between diet self-efficacy for weight control and long-term weight regain in women post bariatric surgery?
3. Is there a relationship between lifestyle behaviors and long-term weight regain in women post bariatric surgery?
4. Is there a relationship between perceived social support and long-term weight regain in women post bariatric surgery?

Research Question 1: Demographic Factors and Regain

The relationship between the demographical factors and weight regain was investigated using a Pearson Chi-square test in the sample (n=123). The correlation between participants' weight regain and demographical factors was nonsignificant at the .001 level of significance for a two-sided tailed test. The demographic factors height and regain reported $p=.132$, between age and regain $p=.860$, between race and regain $p=.060$, between number of household members and regain $p=.546$, between relationship status

and regain $p=.998$, between employment and regain $p=.172$, and between household income and regain $p=.546$.

Research Question 2: Weight Efficacy and Regain

The relationship between weight loss self-efficacy (as measured by the Weight Efficacy Lifestyle Questionnaire [WELQ]) and weight regain was investigated using the Pearson Correlation. The WELQ is a 20-item instrument with five subscales measuring negative emotion (4 items), availability (4 items), social pressure (4 items), physical discomfort (4 items), and positive activities (4 items). The reliability for this instrument reported a Cronbach's alpha of 0.954.

A total of 114/123 (92.7%) participants responded from the sample. The sample WELQ scores reported a ($M = 120.85$, $SD = 37.64$). There was a strong negative correlation between WELQ and regain $p < 0.001$ with high scores self-efficacy associated with lower reported weight regain. Table 5 reports the WELQ compared to regain.

Table 5

WELQ and Regain

Statistics

WELQ

N	Valid 114	Missing 9
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Mean	120.85
Median	122.50
Std. Deviation	37.64
Variance	1416.82
Minimum	1.00
Maximum	180.00

Descriptive Statistics

	<i>n</i>	<i>Mean</i>	<i>SD</i>
Regain	123	20.9309	16.47213
Weight SE	114	120.8509	37.64065

Correlations

		Regain	WeightSE
Regain	Pearson	1	-.316
	Correlation		
	Sig. (2-tailed)		.001
	N	123	114
WeightSE	Pearson	-.316	1
	Correlation		
	Sig. (2-tailed)	.001	
	N	114	114

**. Correlation is significant at the 0.001 level (2-tailed).

Research Question 3: Health Promotion Lifestyle and Regain

The relationship between health promotion lifestyle factors (as measured by the Health Promoting Lifestyle Profile II Questionnaire [HPLP II]) and weight regain was investigated using the Pearson Correlation. The HPLP-II is a 52-item instrument with six subscales measuring physical activity, stress management, spiritual growth, health responsibility, interpersonal relations, and nutrition. The reliability for this instrument reported a Cronbach's alpha of 0.942.

A total of 113/123 (91.86%) participants responded in the sample. The minimum score was 61.0 and the maximum score was 196.0. The sample HPLP II scores reported a ($M=136.39$, $SD = 23.56$). The correlation between weight regain and health promotion lifestyle factors was nonsignificant at the .001 level of significance for a two-sided tailed test ($p=-.138$). Table 6 reports the HPLP-II data compared to regain.

Table 6

HPLP-II and Regain

Statistics		
HPLP-II		
N	Valid	Missing
	113	10
Mean	136.39	
Median	139.00	
Std. Deviation	23.56	
Variance	555.17	
Minimum	61.00	
Maximum	196.00	

Descriptive Statistics

	<i>n</i>	<i>Mean</i>	<i>SD</i>
Regain	123	20.93	16.47213
HPLP II	113	136.39	23.56

Correlations

		HPLP II	Regain
HPLP II	Pearson	1	-.138
	Correlation		
	Sig. (2-tailed)		.146
	N	113	123
Regain	Pearson	-.138	1
	Correlation		
	Sig. (2-tailed)	.146	
	N	123	113

Research Question 4: Perceived Social Support and Regain

The relationship between perceived social support factors (as measured by the Multidimensional Perceived Social Support Scale [MPSS]) and weight regain was investigated using the Pearson Correlation. The MPSS is a 12-item instrument rated with a Likert scale range from 1=Very Strongly Disagree to 7=Very Strongly Agree. The highest score possible is 84, indicating a high perceived amount of social support. The instrument is used to assess the frequency/availability and adequacy of perceived social support from family and friends. The reliability for the MPSS instrument reported a Cronbach's alpha of 0.956.

A total of 122/123 (97.18%) participants responded in the sample. The sample MPSS scores reported a ($M = 68.97$, $SD = 14.37$). The correlation between weight regain

and perceived social support factors was nonsignificant at the .001 level of significance for a two-sided tailed test ($p = .917$). Table 7 reports the MPSS compared to regain.

Table 7

MPSS and Regain

Statistics			
MPSS			
N	Valid	Missing	
	122	1	
Mean	68.97		
Median	72.00		
Std. Deviation	37.64		
Variance	14.37		
Minimum	21.00		
Maximum	84.00		

Descriptive Statistics			
	<i>n</i>	<i>Mean</i>	<i>SD</i>
Regain	123	20.9309	16.47213
Social Support	122	68.97	14.37

Correlations			
		Regain	Social Support
Regain	Pearson	1	-.009
	Correlation		
	Sig. (2-tailed)		.917
	N	123	122
Social Support	Pearson	-.009	1
	Correlation		
	Sig. (2-tailed)	.917	
	N	123	122

CHAPTER 5

SUMMARY

The obesity epidemic and the health risks and comorbidities associated with obesity have led to an increase in demand for bariatric surgery. Although bariatric surgery appears to produce success in a short period of time immediately after surgery, patients' weight regain over time cannot be ignored. Patients face more challenges sustaining the dramatic lifestyle changes required to ensure positive long-term weight loss outcomes.

Psychosocial predictors of bariatric surgery only started becoming more prevalent in the early 2000s. While there is a need to identify factors relating to long-term post-surgical weight management in the bariatric surgery population, there is limited research investigating the psychosocial factors affecting long-term weight regain in bariatric patients, particularly among women, post bariatric surgery. Thus, the purpose of this quantitative research study was to explore the relationships between demographic factors, self-efficacy, health promotion lifestyle habits, social support, and weight regain among women who were 18 months or more post bariatric surgery.

Summary of the Study

Study participants were selected through a convenience sample of adult females who were more than 18 months post bariatric surgery to align with the literature that

identifies 18 months to 2 years as the long-term weight loss period where patients begin to regain weight that was originally lost (Lynch, 2016). The inclusion criteria for the study participation were female adults age 18 years and older, able to read and write English, Internet users with computer literacy, who underwent a bariatric surgery procedure with greater than or equal to eighteen months or more postoperative time. The exclusion criteria for study participation were male, history of having more than one bariatric surgical procedure (a repeat or revision of the original procedure), and health-related hospitalization within the past two years other than the bariatric surgery.

The participants were recruited entirely online over a four-week timeframe from the internet-based Obesity Help Forum and the Women's Health Only Facebook Forum. A posting was placed in the forums containing the invitation email with the researcher's contact information, the purpose of the study, the approximate time involved to complete the survey, and the risks involved in study participation. Participants who met the inclusion criteria and indicated interest in the study were notified they could download a copy for their personal records. Informed consent was confirmed through participants' willingness to click on the link to begin the study. The study was approved by the University of San Diego IRB Committee.

The study instruments used to measure the independent variables were the 20-item Weight Efficacy Lifestyle Questionnaire (WELQ), the 52-item Health Promoting Lifestyle Profile (HPLP-II), and the 12-item Multidimensional Perceived Social Support Scale (MPSS). The reliability of each instrument was analyzed. The WELQ reported a Cronbach's alpha of .945, the HPLP II reported a Cronbach's alpha of .942, and the MPSS reported a Cronbach's alpha of .956.

The study focused on four research questions:

1. Is there a relationship between long-term weight regain and demographical factors in women post bariatric surgery?
2. Is there a relationship between lifestyle behaviors and long-term weight regain in women post bariatric surgery?
3. Is there a relationship between perceived social support and long-term weight regain in women post bariatric surgery?
4. Is there a relationship between diet self-efficacy for weight control and long-term weight regain in women post bariatric surgery?

Summary of the Results

Of the 135 female participants that attempted the survey, 123 completed the SurveyMonkey survey in its entirety. A descriptive correlational research design was used to examine relationships among the variables. The participants' demographic data were reviewed for any correlations with reported regain. Regain was calculated by subtracting the lowest weight reported post-surgery from the current weight reported on the demographic section. A total of 123/135 (91.1%) participants reported weight regain ranging from 1 to 79 pounds with a mean weight regain of 20.93 pounds (SD 16.47) and mean height of 64.54 centimeters (SD 2.836). Twelve of the 135 (8.8%) participants reported no weight regain.

Descriptive statistics were used to compare participants' demographic factors. The majority of participants (60.2%) reported having undergone the Vertical Sleeve Gastrectomy surgery, while 32.5% underwent the RYGB gastric bypass surgery, 6.5% underwent the LABG lap-band surgery, and 0.8% reported 'Other.' The majority of the

participants (39%) were between 55 and 64 years old, with the next most reported age group (30%) at 35 to 44 years old, followed by 6% between 25 and 34 years old, 3% between 64 and 74 years old, and <1% reporting more than 75 years old. Regarding race/ethnicity, the majority of participants (72.4%) were White or Caucasian, while 10.6% were Black or African American, 1.6% reported being American Indian or Alaskan Native, and 3.3% were of multiple ethnicities, including half White half Asian, American Indian/Polish, East Asian and Western European American, and Hispanic Croatian.

The majority of the participants (71.5%) were married, more than half (60.2%) were employed full time, and more than 70% reported having incomes between \$0-\$150,000. More than half of the participants reported having between one and four members in the household, with 8.9% reporting a one-member household, 28.5% reporting a two-member household, 26% reporting a three-member household, and 19.5% reporting a four-member household. Meanwhile, 10.6% of participants reported a five-member household, 2.4% reported a six-member household, and 11.4% reported a seven or more member household.

The relationship between weight loss self-efficacy as measured by the WELQ and weight regain was investigated and there was a strong, negative correlation between the two variables ($p < 0.001$) with high scores self-efficacy associated with lower reported weight regain. Patients reporting the ability to resist eating in a variety of situations and settings were more likely to have less weight regain. Items on the WELQ asked about participants' ability to resist food during emotional encounters, when feeling tired, when being pressured by others to eat, refusing a second helping of food, and other critical

situations. These results suggest developing and teaching bariatric surgery patients to increase their self-efficacy could play a significant role in decreasing the chance of weight regain over time. The health promotion lifestyle factors and the perceived social support factors were nonsignificant at the .001 level of significance for a two-sided tailed test.

Research Limitations

The selection and recruitment of the study participants was nonrandom and performed entirely online through SurveyMonkey, which may be problematic to the external validity of the study. The female participants in the research sample had access to a computer and the Internet and can read and write English; therefore, the results of this study cannot be generalized across all long-term post-operative bariatric surgery patients and all regain situations.

All participants were solicited through Facebook and ObesityHelp.com and self-reported their data. The researcher was unable to monitor whether participants attempted to respond or view the survey multiple times. The survey was created with variables collecting categorical data for age, relationship status, employment, household members and income. It was difficult for the researcher to analyze descriptive statistics, and frequencies were mostly reported. The measurements for height and weight were listed in feet and pounds and participants were asked to input their data into a box. The researcher had to recalculate data that were not listed in feet and pounds because many participants used centimeters and kilograms to disclose height and weight.

The survey did not utilize a built-in mechanism that stopped the participant from moving forward if a question was skipped or missed to prevent missing data. For this

reason, the demographic data of the research reported a sample size of $n=123$ while the descriptive analysis of the WELQ instrument reported $n=114$, the HPLP II instrument reported $n=113$, and the MPSS instrument reported $n=122$.

Implications

There were several research findings that reported weight regain occurring as early as 18 months post bariatric surgery and regain of 15% above the lowest reported weight (Mechanick et al., 2009). There is a need for additional research insight into psychosocial predictors that identify long-term weight loss success of bariatric patients.

In this study, participants answered questions about online web-based social support and nutrition education. The most frequently reported Internet site used was Facebook (74.8%). The most frequently reported type of nutrition education before and after surgery was classroom, group, or individual education (71.5% and 48%, respectively).

The significant negative correlation between weight self-efficacy and weight regain suggests that improving bariatric patients' weight self-efficacy could potentially decrease the chance of weight regain. Understanding the self-efficacy of bariatric surgery patients' dietary habits will provide direction in developing nutrition and cognitive behavioral strategies to promote long-term weight management. Understanding the relationship of weight regain, self-efficacy in nutritional practices, social support, and long-term weight loss outcomes will provide direction for the educational guidelines and practices involved in follow-up care.

The results of this study leave several questions unanswered that future research may be able to explore considering the significant findings related to the use of Internet-

based weight loss support. This research adds to the knowledge that can be used to develop nutrition education programs and web-based applications to provide daily support with meal planning and nutritional decision-making that aligns with long-term follow up care in the bariatric patient population.

Finally, bariatric patients may have difficulty adapting psychologically to the consequences of bariatric surgery (Buschwald & Williams, 2004). Internet social support forums could serve as interactive platforms to guide post-operative nutritional follow-up care and cognitive-behavioral strategies. A similar concept is seen through Weight Watchers online platforms where participants have access to a coach, accountability weight check-ins, and healthy meal preparation resources. Long-term, web-based, follow up care would be sustainable with minimal cost to healthcare providers. The forums used to solicit participation in this research had no guided interaction with a healthcare provider. Future research could potentially focus on the long-term weight regain in participants using web-based interactive forums.

It is worth noting that problems after weight loss can manifest in different ways and it is important that healthcare providers monitor, support, and prepare patients for the challenges they may encounter (Fisher & Kridli, 2014). Behavior modification strategies such as food diaries and weight accountability check-ins should be integrated into post-operative care and can be easily sustained long term if provided in a web-based forum. Strategies to improve self-efficacy can also be integrated in a web-based forum (Dahl, Hales, & Turner, McGrievy, (2016).

Obesity is often a chronic, insidious disease that has impacted the majority of a bariatric patient's life. However, surgery is not the 'magic bullet' solution for chronic

obesity, and care for the bariatric patient should not end with the surgery. Understanding the relationship between potential psychosocial predicting variables of surgical outcomes may lead to the development of necessary monitoring, support, and guidelines that help ensure long-term weight loss success for bariatric surgery patients.

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Appendix A

Demographic Questionnaire

Section 1 Location of residence:

Individual Age:

Gender:

Height and Current Weight:

Race/ethnicity:

Level of Education:

Marital Status:

Number of members resident in the household:

Employment status:

Annual Household Income:

Section 2 Date of bariatric surgery:

Surgery and Type of bariatric surgery:

Weight BMI before surgery:

Weight before surgery:

Lowest weight post-surgery:

Diagnosed illness or chronic disease (comorbidities) before surgery:

Current diagnosis of illness or chronic disease (comorbidities):

Section 3 Do you use the Internet for social support? If so list the forums (e.g.,
Regain and Facebook, Obesity Help.org):
Long-Term Did you receive any nutrition education prior to surgery?
Outcomes If so what type of format? Type: class, informational pamphlet, book,
website, audio/visual?
If other, describe:
Did you receive any nutrition education post-surgery?
If so what type of format? Type: class, informational pamphlet, book,
website, audio/visual?
If other, describe:
Are you currently using prescription medications? If so, please list:

0	1	2	3	4	5	6	7	8	9
Not confident									Very confident

5. I can resist eating when I am watching TV

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

6. I can resist eating when I am depressed (or down)

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

7. I can resist eating when there are many different kinds of food available

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

8. I can resist eating even when I feel it's impolite to refuse a second helping

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

9. I can resist eating even when I have a headache

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

10. I can resist eating when I am reading

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

11. I can resist eating when I am angry (or irritable)

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

12. I can resist eating even when I am at a party

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

13. I can resist eating even when others are pressuring me to eat

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

14. I can resist eating when I am in pain

0	1	2	3	4	5	6	7	8	9
Not									Very
confident									confident

15. I can resist eating just before going to bed

0	1	2	3	4	5	6	7	8	9
Not confident									Very confident

16. I can resist eating when I have experienced failure

0	1	2	3	4	5	6	7	8	9
Not confident									Very confident

17. I can resist eating even when high-calorie foods are available

0	1	2	3	4	5	6	7	8	9
Not confident									Very confident

18. I can resist eating even when I think others will be upset if I don't eat

0	1	2	3	4	5	6	7	8	9
Not confident									Very confident

19. I can resist eating when I feel uncomfortable

0	1	2	3	4	5	6	7	8	9
Not confident									Very confident

20. I can resist eating when I am happy

0	1	2	3	4	5	6	7	8	9
Not					Very				
confident					confident				

Appendix C

HPLP-II Survey

LIFESTYLE PROFILE II

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits. Please respond to the items as accurately as possible. Only circle one number for each item. Indicate the frequency with which you engage in each behavior by circling:

1 for Never, 2 for Sometimes, 3 for Often, or 4 for Routinely

	Never		Routinely	
1. Discuss my problems and concerns with people close to me.	1	2	3	4
2. Choose a diet low in fat, saturated fat, and cholesterol.	1	2	3	4
3. Report any unusual signs or symptoms to a physician or other health professional.	1	2	3	4
4. Follow a planned exercise program.	1	2	3	4
5. Get enough sleep.	1	2	3	4
6. Feel I am growing and changing in positive ways.	1	2	3	4
7. Praise other people easily for their achievements.	1	2	3	4
8. Limit use of sugars and food containing sugar (sweets).	1	2	3	4
9. Read or watch TV programs about improving health.	1	2	3	4
10. Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).	1	2	3	4
11. Take some time for relaxation each day.	1	2	3	4

1 for Never, 2 for Sometimes, 3 for Often, or 4 for Routinely

	Never		Routinely	
12. Believe that my life has purpose.	1	2	3	4
13. Maintain meaningful and fulfilling relationships with others.	1	2	3	4
14. Eat 6-11 servings of bread, cereal, rice and pasta each day.	1	2	3	4
15. Question health professionals in order to understand their instructions.	1	2	3	4
16. Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).	1	2	3	4
17. Accept those things in my life which I can not change.	1	2	3	4
18. Look forward to the future.	1	2	3	4
19. Spend time with close friends.	1	2	3	4
20. Eat 2-4 servings of fruit each day.	1	2	3	4
21. Get a second opinion when I question my health care provider's advice.	1	2	3	4
22. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).	1	2	3	4
23. Concentrate on pleasant thoughts at bedtime.	1	2	3	4
24. Feel content and at peace with myself.	1	2	3	4
25. Find it easy to show concern, love and warmth to others.	1	2	3	4

1 for Never, 2 for Sometimes, 3 for Often, or 4 for Routinely

	Never		Routinely	
26. Eat 3-5 servings of vegetables each day.	1	2	3	4
27. Discuss my health concerns with health professionals.	1	2	3	4
28. Do stretching exercises at least 3 times per week.	1	2	3	4
29. Use specific methods to control my stress.	1	2	3	4
30. Work toward long-term goals in my life.	1	2	3	4
31. Touch and am touched by people I care about.	1	2	3	4
32. Eat 2-3 servings of milk, yogurt or cheese each day.	1	2	3	4
33. Inspect my body at least monthly for physical changes/danger signs.	1	2	3	4
34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).	1	2	3	4
35. Balance time between work and play.	1	2	3	4
36. Find each day interesting and challenging.	1	2	3	4
37. Find ways to meet my needs for intimacy.	1	2	3	4
38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	1	2	3	4
39. Ask for information from health professionals about how to take good care of myself.	1	2	3	4

1 for Never, 2 for Sometimes, 3 for Often, or 4 for Routinely

	Never		Routinely	
40. Check my pulse rate when exercising.	1	2	3	4
41. Practice relaxation or meditation for 15-20 minutes daily.	1	2	3	4
42. Am aware of what is important to me.	1	2	3	4
43. Get support from a network of caring people.	1	2	3	4
44. Read labels to identify nutrients, fats, and sodium content in packaged food.	1	2	3	4
45. Attend educational programs on personal health care.	1	2	3	4
46. Reach my target heart rate when exercising.	1	2	3	4
47. Pace myself to prevent tiredness.	1	2	3	4
48. Feel connected with some force greater than myself.	1	2	3	4
49. Settle conflicts with others through discussion and compromise.	1	2	3	4
50. Eat breakfast.	1	2	3	4
51. Seek guidance or counseling when necessary.	1	2	3	4
52. Expose myself to new experiences and challenges.	1	2	3	4

© S.N. Walker, K. Sechrist, N. Pender, 1995. Reproduction without the author's express consent is not permitted. Permission to use this scale may be obtained from Susan Noble Walker, College of Nursing, University of Nebraska Medical Center, Omaha, NE 68198-5330.

Appendix D

MPSS Survey

MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT

Multidimensional Scale of Perceived Social Support

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the "1" if you **Very Strongly Disagree**
 Circle the "2" if you **Strongly Disagree**
 Circle the "3" if you **Mildly Disagree**
 Circle the "4" if you are **Neutral**
 Circle the "5" if you **Mildly Agree**
 Circle the "6" if you **Strongly Agree**
 Circle the "7" if you **Very Strongly Agree**

1.	There is a special person who is around when I am in need.	1	2	3	4	5	6	7	SO
2.	There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5	6	7	SO
3.	My family really tries to help me.	1	2	3	4	5	6	7	Fam
4.	I get the emotional help and support I need from my family.	1	2	3	4	5	6	7	Fam
5.	I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7	SO
6.	My friends really try to help me.	1	2	3	4	5	6	7	Fri
7.	I can count on my friends when things go wrong.	1	2	3	4	5	6	7	Fri
8.	I can talk about my problems with my family.	1	2	3	4	5	6	7	Fam
9.	I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7	Fri
10.	There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7	SO
11.	My family is willing to help me make decisions.	1	2	3	4	5	6	7	Fam
12.	I can talk about my problems with my friends.	1	2	3	4	5	6	7	Fri

The items tended to divide into factor groups relating to the source of the social support, namely family (Fam), friends (Fri) or significant other (SO).

Appendix E

Email Consent for Participation

Hello,

My name is Raelene Brooks, I am a student in the Hahn School of Nursing at the University of San Diego, San Diego, CA. I am conducting a research study about Bariatric Surgery Regain and Long Term Outcomes among Women and I would like to invite you to participate.

The purpose of this study is to examine lifestyle behaviors, social support, and weight loss self confidence among women post bariatric surgery. You are being asked to participate because you had bariatric surgery greater than 1.5-2 years or more ago and you are a woman.

If you decide to participate, you will be asked to complete an online survey one time that takes about 16 minutes to complete each time. You will be asked things like: "What was your lowest weight recorded post bariatric surgery" "I can resist eating when I feel physically run down"

You will also be asked a few questions about yourself, such as your "age, height and current weight, marital status, level of education, date of bariatric surgery, type of bariatric surgery".

This study involves no more risk than the risks you encounter in daily life. Your responses will be kept confidential and all your information will be coded with a number. Your email or IP address will automatically be deleted, and nobody will know your identity. I will keep the study data for a minimum of 5 years.

Taking part in this study is entirely optional. You may also quit being in the study at any time or decide not to answer any specific questions. Should you decide to participate, **please print out a copy of this page for future reference.**

I will be happy to answer any questions you have about the study. You may contact me, Raelene Brooks at 619-957-3106 or raelenebrooks@sandiego.edu. You can also contact Dr. Kathy James at 619-260-4578 or kjames@sandiego.edu

If you would like to participate, please click on this link to begin the study:

<https://www.surveymonkey.com/r/REGAINOUTCOMES>

Thank you for your consideration.

Raelene Brooks

Appendix F

USD IRB Approval

rb@sandiego.edu <irb@sandiego.edu>

Tue, Dec 12, 2017 at 10:47 AM

To: kjames@sandiego.edu, raelenebrooks@sandiego.edu

Dec 12, 2017 10:47 AM PST

Raelene Brooks
Hahn School of Nursing & Health Science

Re: Expedited - Initial - IRB-2018-180, Bariatric Surgery Regain and Long Term Outcomes among Women: Self-Efficacy, Social Support and Health Promotion Lifestyle Behaviors

Dear Raelene Brooks:

The Institutional Review Board has rendered the decision below for IRB-2018-180, Bariatric Surgery Regain and Long Term Outcomes among Women: Self-Efficacy, Social Support and Health Promotion Lifestyle Behaviors.

Decision: Approved

Selected Category: 7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Findings: None

Research Notes:

Internal Notes:

Note: We send IRB correspondence regarding student research to the faculty advisor, who bears the ultimate responsibility for the conduct of the research. We request that the faculty advisor share this correspondence with the student researcher.

The next deadline for submitting project proposals to the Provost's Office for full review is N/A. You may submit a project proposal for expedited or exempt review at any time.

Sincerely,

Dr. Thomas R. Herrinton

Administrator, Institutional Review Board

Office of the Vice President and Provost

Hughes Administration Center, Room 214

5998 Alcalá Park, San Diego, CA 92110-2492

Phone (619) 260-4553 • Fax (619) 260-2210 • www.sandiego.edu

Appendix G

Letter of Permission for Use of WELQ

Raelene Brooks <raelenebrooks@sandiego.edu> 12/13/17

to Matthew

Thank you Dr. Clark. Happy Holidays to you.

Get [Outlook for iOS](#)

From: Clark, Matthew M., Ph.D., L.P. <Clark.Matthew@mayo.edu>

Sent: Tuesday, December 12, 2017 6:04:33 AM

To: 'Raelene Brooks'

Subject: RE: PERMISSION TO USE WEIGHT EFFICACY LIFESTYLE QUESTIONNAIRE

If you want to use the original 20 item version you have my written permission to use the WEL. If you want the newer short version, you need to contact Dr. Ames at Mayo Clinic Jacksonville. Best wishes with your research.

Matthew M. Clark, PhD

Professor of Psychology

Mayo Clinic

From: Raelene Brooks [mailto:raelenebrooks@sandiego.edu]

Sent: Monday, December 11, 2017 10:14 PM

To: Ames, Gretchen E., Ph.D.; Heckman, Michael G., M.S.; Diehl, Nancy N.; Clark, Matthew M., Ph.D., L.P. [RO P-W11]

Cc: Raelene Brooks

Subject: PERMISSION TO USE WEIGHT EFFICACY LIFESTYLE QUESTIONNAIRE

Appendix H

Letter of Permission for Use of HPLP-II

COLLEGE OF NURSING
Community-Based Health Department

985330 Nebraska Medical Center
Omaha, NE 68198-5330
402/559-6382
Fax: 402/559-6379

Dear Colleague:

Thank you for your interest in the *Health-Promoting Lifestyle Profile II*. The original *Health-Promoting Lifestyle Profile* became available in 1987 and has been used extensively since that time. Based on our own experience and feedback from multiple users, it was revised to more accurately reflect current literature and practice and to achieve balance among the subscales. The *Health-Promoting Lifestyle Profile II* continues to measure health-promoting behavior, conceptualized as a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization and fulfillment of the individual. The 52-item summated behavior rating scale employs a 4-point response format to measure the frequency of self-reported health-promoting behaviors in the domains of health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management. It is appropriate for use in research within the framework of the Health Promotion Model (Pender, 1987), as well as for a variety of other purposes.

The development and psychometric evaluation of the English and Spanish language versions of the original instrument have been reported in:

- Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. *Nursing Research*, 36(2), 76-81.
- Walker, S. N., Volkan, K., Sechrist, K. R., & Pender, N. J. (1988). Health-promoting lifestyles of older adults: Comparisons with young and middle-aged adults, correlates and patterns. *Advances in Nursing Science*, 11(1), 76-90.
- Walker, S. N., Kerr, M. J., Pender, N. J., & Sechrist, K. R. (1990). A Spanish language version of the Health-Promoting Lifestyle Profile. *Nursing Research*, 39(5), 268-273.

Copyright of all versions of the instrument is held by Susan Noble Walker, EdD, RN, FAAN, Karen R. Sechrist, PhD, RN, FAAN and Nola J. Pender, PhD, RN, FAAN. The original *Health-Promoting Lifestyle Profile* is no longer available. You have permission to download and use the HPLPII for non-commercial data collection purposes such as research or evaluation projects provided that content is not altered in any way and the copyright/permission statement at the end is retained. The instrument may be reproduced in the appendix of a thesis, dissertation or research grant proposal. Reproduction for any other purpose, including the publication of study results, is prohibited.

A copy of the instrument (English and Spanish versions), scoring instructions, an abstract of the psychometric findings, and a list of publications reporting research using all versions of the instrument are available for download.

Sincerely,

Susan Noble Walker, EdD, RN, FAAN
Professor Emeritus

Appendix I

Letter of Permission for Use of MPSS

12/11/2017

Indiana School of Medicine 410 West 10th Street, Suite 1001, Indianapolis,
IN 46202-5140

Dear Sir/Madam:

I am a doctoral student at the Hahn School of Nursing at the University of San Diego writing my dissertation *Bariatric Surgery Regain and Long Term Outcomes among Women: Self-Efficacy, Social Support and Health Promotion Lifestyle Behaviors* under the direction of my dissertation committee chaired by Dr. Kathy James. The University of San Diego IRB Committee Chair can be contacted at 5998 Alcalá Park San Diego, CA 92110 Phone: (619) 260-4553 irb@sandiego.edu

I would like your permission to use the Multidimensional Scale of Perceived Social Support (MSPSS). I would like to administer your instrument under the following conditions:

- I will use this survey only for my research study and will not sell or use it with any compensated or curriculum development activities.
- I will include the copyright statement on all copies of the instrument.
- I will send a copy of my research study to your attention upon completion of the study.

If these are acceptable terms and conditions, please indicate so by signing one copy of this letter and returning it to me by email at raelenebrooks@sandiego.edu

Respectfully,

Raelene Brooks

Raelene Brooks, Doctoral Candidate

raelenebrooks@sandiego.edu

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

By: Gregory D. Zimet, PhD

Title: Multidimensional Scale of Perceived Social Support (MSPSS)

Date: 12/12/2017

From: rpeterston1@unl.edu
Reece Peterson <rpeterston1@unl.edu>
 Subject: Re: Permission to Use SRS Safe Schools Survey
 To: **Scot Strang**

Example of electronic
response

Return-Path: <rpeterston1@unl.edu>
 Received: from barracuda.esdnl.ca (198.165.212.15)
 by mail.esdnl.ca (FirstClass Mail Server v11.0 build 11.000) with ESMTP
 (Sender: rpeterston1@unl.edu)
 for <scotstrang@esdnl.ca>
 transient id 7590: Tue, 23 Aug 2011 15:30:26 -0230

Scot-

Yes, you have my permission to use the SRS survey materials under the conditions you indicated! I would also be very interested in the results of your dissertation study when it is available. Could you share that?

Cheers,

Reece Peterson

Appendix J

Literature Review Matrix

#	Reference: Author & Title	Year & Country	Design/ Article/Journal / Framework	Independent Variables	Dependent Variables	# of Participants	Participants Characteristics	Instrument	Results 1	Results 2	NOTES
14	Agüera, Z., Garcia-Ruiz-deGordajuela, A., Vilarasa, N. Sanchez, L., Riano, M., Camacho, L., Ganero, R., Jimenez-Murcia, S. et.al. Psychological and personality predictors of weight loss and comorbid metabolic changes after bariatric surgery	2015, Barcelona Spain	Descriptive Correlational over 24 months follow-up times 3, 6, 12, 18, 24 months. Stepwise Logistical Regression, Generalized Estimated Equation (GEE)	Total weight loss, DM, dyslipidemia, arterial hypertension, obstructive sleep apnea, Age, BMI, Surgery Type, marital status,	Estimated Weight Loss (EWL) >60%	The sample included 139 severely obese participants (181 men (22.3%) and 108 women (77.7%)) who underwent various B5 procedures at the University Hospital of Bellvitge, Barcelona, Spain	18-62 years mean age of 40.6 (SD=10.3), mean BMI 46.8 (SD=6.4). Employed-56.8%, married or with a partner -55.4%.	Eating Disorders Inventory-2, Symptom Checklist Revised (SCL-2R) and Temperament and Character Inventory-Revised (TCI-R), Barrat Impulsiveness Scale-11 (BIS-11), Symptom Checklist-90 Items Revised (SCL-90-R). All instruments were in the Spanish version and all have the number of items reported in the article, dimensions measured, validity and reliability Chronbach's alpha reported.	Besides clinical and surgical factors, specific psychopathological and personality traits might affect weight loss after BS and their associated metabolic comorbidities. In light of our results, we suggest that age, baseline BMI and some psychopathological factors (mainly low depression and milder symptoms of anxiety), as well as high cooperativeness, were positively associated with successful BS outcome.	The inclusion criteria for the study according to NIH (NIH, 1992) were as follows: (1) BMI >40 or BMI >35 with obesity related comorbidities [dyslipidaemia (DLP), T2DM, AHT and OSA]; (2) age between 18-65 years; (3) having undergone hypocaloric diet controlled by a nutritionist but with a lack of expected weight loss; (4) capacity to understand the processes involved; and (5) motivation for surgery. Likewise, the exclusion criteria were significant psychiatric disorders (such as schizophrenia, other psychotic disorders, bipolar disorder and active alcohol or substance abuse).	Therefore, the main goals of the present prospective study were as follows: (1) to assess the weight loss and the comorbidities remission in severely obese patients following BS and (2) to assess and identify clinical, psychopathological and personality predictors of short-term treatment outcome (regarding %EWL and metabolic conditions), after controlling for relevant variables, such as type of BS.
19	Boeka, A., Prentice-Dunn, S., Lokken, K. Psychosocial predictors of intentions to comply with bariatric surgery guidelines	2010, Alabama, U.S.A.	Pilot study with a control group and a PMT group. Post Hoc Analysis/Protection Motivation Theory (PMT), Self-Efficacy/ Psychology, Health and Medicine	Anthropometric measures used to assess or bariatric surgery, RYGBP	Compliance with post-surgical eating behavior guidelines	82 Adults	Ages of 21 and 56 who were seeking RYGBP surgery at a major medical center in the southeastern United States. All participants met criteria for bariatric surgery (i.e. BMI 40 or BMI 35 with medical comorbidities). The PMT group (n=44) consisted of 15 males and 29 females and the control group (n=38) contained 14 males and 24 females. Both groups had completed an average of 14 years of education and the majority of participants in both groups identified as Caucasian. The average BMI of patients in the PMT group was 51.8 kg/m ² and that of the control group was 50.1 kg/m ² . There were no significant differences between the two groups on any demographic variables (see Table 2).	Protection Motivation Theory (PMT)-Participants completed a 32-item questionnaire that contained manipulation check items for the primary PMT variables (severity of threat, vulnerability, response efficacy, and self-efficacy) during the study session and 1 week later. Each PMT variable was represented by a sum of eight items, each rated on a 1-4 point Likert scale. These items were similar in structure and content to items used in prior PMT studies (Fry & Prentice-Dunn, 2005; 2006; McVath & Prentice-Dunn, 2005; Prentice-Dunn et al., 2009).	Although the intervention did not produce significant group differences, the PMT components of self-efficacy and threat proved to be useful in predicting patients' intentions to adhere to the post-surgical eating behavior guidelines. These preliminary results imply that bariatric surgery teams should strive to ensure that patients adequately understand and the consequences of not following recommendations and that the teams adequately bolster patients' confidence in their ability to adhere to the guidelines. These results also suggest that it might be fruitful for surgery teams to spend adequate time educating patients about appropriate post-surgical guidelines.	Individuals in the control group also attended the study session in a small group format and received follow-up questionnaires via mail. However, control participants did not receive any information on the post-surgical eating behavior guidelines from the investigator. Rather, these individuals received standard information from the bariatric surgeon and his staff which is provided to all pre-surgical patients, including information on appropriate post-surgical eating guidelines, such as eliminating sugar, eating slowly, and eating adequate protein.	Keywords: protection motivation theory; health behavior model; post-surgical compliance; bariatric surgery outcome. Approximately 90% of patients who undergo RYGBP surgery can expect to lose 30-50% of their body weight after surgery (Mun, Blackburn, & Matthews, 2001), although sustained weight loss requires adherence to strict post-surgical guidelines. There is growing evidence that some patients struggle to adhere to the post-operative eating behavior guidelines (Anderson & Larsen, 1989; MacLean, Rhoads & Shigal, 1983; Sarwer et al., 2008) and patients often revert back to pre-surgical eating habits. Such eating habits can reduce or even reverse post-surgical weight loss (Halverson & Koehler, 1981; Hsu, Sullivan, & Benotti, 1997; Kalachian et al., 2002; Rabner & Greenstein, 1991; Sarwer et al., 2008).
9	Folope, V., Helot, MF., Kuhn, JM., Tenier, P., Scott, M., Dechelotte, P. ORIGINAL ARTICLE Weight loss and quality of life after bariatric surgery: a study of 200 patients after vertical gastropasty or adjustable gastric banding	2008, Cedex France	Descriptive Correlational Prevalence study/ European Journal of Clinical Nutrition	Comorbidities, ESL, number of years post op, BMI, percentage of weight loss. Total QoL score includes the following variables: Self-esteem score, Physical activity score, Social life score, Work score, Sexual life score.	Nutritional outcomes and Quality of Life	n=200 87% of women and 13% of men were assessed.	Adults that have received the VBG(M)-Vertical-banded gastropasty according to Mason and Adjustable gastric banding (AGB), BMI >40, weight and BMI were similar in the four sub-groups at the time of surgery (Figures 1a and 2a). In contrast, weight and BMI were significantly different (p<0.001) at the time of the questionnaire (Figures 1b and 2b).	Moorehead-Ardelt questionnaire. This questionnaire evaluates five items: self-esteem, physical activity, social life, work conditions and sexual activity. Five answers are proposed for each item. A score is attributed for each answer: 1 to 5 for self-esteem and 0.5 to 5 for physical activity, social life, work and sexual life. A maximum of 9 can be obtained for the total QoL score. The questionnaire presentation with pictures makes it use easy and accessible to all patients. It can be completed in less than 1 min and does not require a preliminary appointment with a physician. It is a reliable way to evaluate obesity	The study provides additional data on the medium and long-term evolution of QoL and weight in a large population of obese people undergoing bariatric surgery. QoL appears tightly correlated with weight loss and independent of the occurrence of digestive symptoms. The non-randomized comparison of results after VBG(M) and AGB are clearly in favor of VBG(M) both for weight loss and QoL improvement, despite the higher initial weight of patients in the VBG(M) group. One of the innovative aspects of the study is that the results on weight and QoL appear to deteriorate significantly after 5 years post-operatively, although BMI was still significantly lower than the preoperative data.	Total QoL score includes the following variables	The NIH in 1991 identified a gap in the standard instrument's evaluating the different treatments for obesity, and the need to evaluate the role of surgery in the treatment of extreme obesity according to the results not only in terms of weight loss and comorbidities improvement but also in terms of QoL. There was a regular loss of weight during the first 5 years following surgery, whereas there was a tendency to gain weight during the five following years (Figure 1b). The weights measured at 5 and 10 years of follow-up care were not different from those observed 1 year after surgery. Therefore the maximal drop of BMI was obtained 5 years post op

12	Haldis, O.L., Aastrom, S., Rortviet, K. Patients' daily life experiences five years after gastric bypass surgery a qualitative study	2015, Haugend, Norway	Phenomenological lifeworld perspective, qualitative, descriptive and retrospective design/ Journal of Clinical Nursing	Gender, age, marital status, BMI before surgery, Lowest BMI after surgery, Five year	Life experience five years after gastric bypass surgery	10 men & women	Of the 11 patient asked to participate in the study five years after surgery in the spring of 2012, 10 Norwegian adults (3 men and seven women) aged between 39-57 agreed to participate. Table 1 details the patients' ages, gender, BMI, work status and if body contouring surgery had been carried out after the weight loss. They were asked about BMI before surgery, lowest BMI after surgery and current BMI.	A qualitative method using content analysis (Graneheim & Lundman 2004) was employed to facilitate a deeper understanding of patients' experiences five years after GBS. Patients' perceptions were explored (Whitehead 2007) as they reflected on their experiences of GBS.	This study revealed that their transformation from a big to a smaller body influences changes in self-esteem. The variation in the self-evaluation before and after weight loss was reflected on by the patients. In the literature, the association between BMI and psychological well-being is debated. Goffman (Goffmann 2009) defines stigma as a deeply discrediting attribute in the context of a set of relationships.	The patients recruited for this study were mainly satisfied with their lives five years after surgery. According to earlier studies, about 20-30% of patients fail to achieve successful weight loss or regain much of the lost weight over time (Sjostrom et al. 2004, Christou et al. 2006).	Key words: gastric bypass surgery, in-depth interviews, qualitative method, weight loss. The experience of satisfaction with the outcome of GB varies according to the individual. Those who undergo GB experience enormous changes in their daily lives. Their social lives, their relationship to their bodies and self-esteem are altered by the weight loss. During the life journey after surgery, many unexpected difficulties and feelings were disclosed that caused problems in daily life. We suggest that future qualitative studies explore daily life problems with a select sample of patients who have had problems after surgery. We also suggest that future research highlight other important issues, such as family support after GBS and guilt and shame.
11	Harbottle, L. Audit of nutritional and dietary outcomes of bariatric surgery patients	2011, St. Martins, Guernsey, Channel Islands	Descriptive Correlational Prevalence study/ Obesity Reviews	Gender, age, time since surgery, BS procedure, prep BMI, Previous dietetic input, prep dietetic assessment, prep psych assessment, prep dietetic advice, dietetic follow up, psych follow up	Nutrition and Dietary Outcomes and weight loss outcomes	177 patients (24 male and 153 female) were identified as having undergone bariatric surgery between 2001 and November 2008 (see Table 1).	Of 177 questionnaires posted, 68 were completed and returned (38%). Of these seven (10%) were male. The average age at operation was 44 years (range 22-64 years). Mean duration since surgery was 2.4 years (range 2 months-5 years).	Questionnaire regarding NICE Guidelines	Percentage weight regain were on average 5.4% (SD 8.23), 12.2% (SD 9.02) and 26.4% (SD 25.54) in the 5 years subgroups, respectively. Mean overall weight losses equated to 30.1% (range 14.8%-55.4%) in the 5 years groups.	The weight loss (averaging around a third of initial weight) and regain data obtained from this audit are comparable to those observed internationally, highlighting a trend towards increased weight regain over time, with a potential return of comorbidities. It has also been demonstrated that those who are followed up less frequently tend to regain more weight than those frequently monitored by a specialist multidisciplinary team	The National Institute for Clinical Excellence (NICE) guidelines (13) set out a clear framework for the safe and effective management of bariatric surgery patients in the UK. This study was an audit to ascertain which Guidelines were being followed. The audit data also indicate variability in prescribing and/or poor compliance with micronutrient supplementation, with a significant proportion of respondents being identified with clinical deficiencies, despite a lack of systematic monitoring and review. It may be expected that the identified deficiencies represent only the tip of the iceberg in relation to optimal nutritional status
13	Hillstrom, K., Graves, J. A review of Depression and Quality of Life Outcomes in Adolescents Post Bariatric Surgery	2015, Los Angeles, CA, U.S.A.	Literature review/ Journal of Child and Adolescent Psychiatric Nursing	Type of study, gender, age range, mean age, ethnicity, Pre and Post BMI, Follow up period	QOL, Depression	A total of 10 studies were included in this analysis. A summary of the studies is provided in Table 1. A total of 322 unique patients were included (one study population was included twice at different follow-up intervals).	The number of patients per study ranged from 10 to 101 and represented patients from Austria, Australia, Sweden, and the United States. Five studies (n = 174) from the United States included racial/ethnic information as follows: 97 White/Caucasians (54%), 26 Black/African Americans (15%), 40 Hispanics (23%), 5 other (0.3%), 1 biracial (0.06%), and 5 were not indicated (0.3%). The patients' ages ranged from 9 to 20 years with an average age of 16.63 years.	There were six instruments utilized to measure QOL. Four studies used the Pediatric Quality of Life Inventory (PedsQL), which is a 23-item health-related QOL survey with four subscales that include physical, emotional, social, and school functioning (Varni, Seid, & Kurtin, 2001). Six different instruments were utilized to measure QOL. A total of three different instruments were utilized to measure depression. Four studies measured only QOL; two measured QOL, weight related QOL, and depression; two measured QOL and depression; one measured QOL and weight-related QOL; and one measured only depression	Of the 322 patient gender information was available for 311. There were a total of 214 (70%) females and 97 (30%) males. The results from this analysis indicate the need for more thorough and uniform psychological measurements to be developed and implemented with all youth who undertake this life-altering surgery and for many years following the surgery. Instruments need to be age appropriate and measure a wider variety of psychosocial outcomes. The American Academy of Pediatrics set the eligibility age for bariatric surgery when adolescents reach skeletal maturity, which is 13 years for girls and 15 years for boys (Inge et al., 2004).	Numerous limitations to this study including inconsistent classification of adolescents in different countries. There were nine prospective studies and one randomized control study. The follow-up times for measuring depression and QOL post bariatric surgery varied from 3.6 months to 11.5 years. Four studies in this review had follow-up time of 12 months or less, one averaged 17 months, two were at 24 months, and three studies reported findings more than 2 years after surgery.	Methods: MEDLINE, PubMed, CINAHL, and PsycINFO were searched using the key words: "adolescent obesity," "depression," "quality of life," and "bariatric surgery." Relevant papers cited in articles were also examined for inclusion. Articles were included if they examined changes in depression and QOL outcomes among bariatric adolescent patients with a mean age no higher than 18 years. Articles had to include a measurement prior to surgery and a measurement after surgery. There was no restriction on the number of patients, length of follow-up, type of surgery, country where the surgery was performed, or instrument utilized. Only peer-reviewed journal articles were included; dissertations and gray literature were not included in this review.
2	Jumbe, S., Bartlett, C., Jumber, S., Meyrick, J. The effectiveness of bariatric surgery on long term psychosocial quality of life A systematic review	2014 U.K.	Systematic review. A meta-analysis could not be done because of the variations on study design-Obesity Research and Clinical Practice. RCTs, controlled clinical trials and prospective cohort studies comparing surgical interventions with nonsurgical treatment/ NEED	Any type of bariatric surgery procedure, Nonsurgical diet, behavioral/medical management, exercise, counseling, Studies including participants with history of BS were excluded	Pre and Post Quality of Life with a minimum of 12 months follow up	1443 references identified references Cochrane Library PubMed via NCBI, MEDLINE, PsycINFO via EBSCO, ScienceDirect, JSTOR	Adults >18 years old, BMI of 30 or >	SF-36 Health questionnaire and Impact of Weight on QOL-lite (IWQOL-lite), EuroQol 5 Dimensions, Linear Analogue Self Assessment, SF-12 short form of SF-36, Psychosocial Stress and Symptom Quest, Current Health Scale, Mood Adjective Checklist, Obesity-related Problems Scale, Sickness Impact Profile	It seems inducing significant weight loss alone by means of bariatric surgery may not address longer term psych issues like depression, body dissatisfaction, and problematic eating behaviors that may initially be present in individuals suffering from obesity.	Study quality was assessed using the Effective Public Health Practice Project - a robust tool with appropriate psychometric properties used to adequately assess quality of evidence. No discreet definition of long term was presented, however, following previous review findings (42) studies reported over 5 year follow up periods were classed as longer term. Duration of follow up 12 mo-10 years	

15	Kalarchian, M. Marcus, M. Psychosocial interventions pre and post bariatric surgery	2015, Pittsburg, PA U. S. A.	Review of Literature/ European Eating Disorder Journal	Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), Dialectical Behavioral Therapy (DBT)??? The article did not disclose details of the therapy.	Estimated Weight Loss (EWL)	Reported statistics within the literature review	BMI >40 and post op BS statistical data reported within the literature citing follow up weight loss within specific timeframes	no specific measurements disclosed highlights of articles cited within the review	Citations of numerous articles reporting weight loss and weight gain over long-term (2 years or greater). Intervention delivery via online and mobile-device applications may also prove to be an effective and efficient way to promote positive outcomes in this patient population. Available data suggest that computer-assisted technologies currently in use and under development may be effective for behavioural assessment and intervention among bariatric surgery patients (Thomas, Bond, Sarwer, & Wing, 2011). For example, we are currently evaluating meal replacements to promote dietary adherence following RYGB. Bariatric surgery patients who do not respond to intensive behavioural strategies may benefit from pharmacotherapy (Heber et al., 2010) or a subsequent surgical procedure, known as reoperative bariatric surgery (Brethauer et al., 2014).	Studies designed to identify the most effective strategies for optimizing outcomes of bariatric surgery are indicated. Adaptive interventions use predetermined decision rules to guide treatment based on patient characteristics and response and may be particularly useful for adjunctive care in bariatric surgery. For example, one type of adaptive intervention, stepped care, could readily be adapted for this patient population. In a stepped care approach to obesity treatment, intervention frequency, mode of delivery and behavioural strategies may be modified periodically in response to actual weight loss relative to goals for weight loss. A stepped care intervention approach has proven to be an efficient use of resources for supporting behavioural weight loss (Jakicic et al., 2012). We think adaptive interventions are needed post-surgery, when routine follow-up with provision of guidelines for diet and physical activity may be sufficient for some, but others may require more intensive contact and strategies to reach their goals.	Despite positive results for bariatric surgery overall, a substantial number of patients experience poor long-term weight loss. For example, at longer-term follow-up in the Swedish Obese Subjects study, 10% of Roux-en-Y gastric bypass (RYGB) patients had not maintained ≥5% weight loss 10 years post-surgery (Sjöström et al., 2004). At 3-year follow-up in the Longitudinal Assessment of Bariatric Surgery research consortium in the United States (US), the median weight loss was 31.5% for RYGB and 15.9% for adjustable gastric banding, with the majority of patients experiencing maximum weight change during their first year (Courcoulas et al., 2013). However, there was substantial variability in the amount of weight loss, and five distinct weight change trajectory groups were identified for each procedure. For example, among RYGB patients, all trajectories showed some weight regain beginning between 6 months and 2 years post-surgery. In 24% of RYGB patients, the regain was considerable relative to their overall weight loss. These findings highlight the opportunity to help all patients achieve the best possible post-surgery weight trajectory.
20	Livhits, M., Mercado, C., Yermilov, I., Parkhi, A., Dutton, E., Mehran, C., Ko, P., et. al/ Is social support associated with greater weight loss after bariatric surgery?: a systematic review	2011, UCLA, U.S.A.	Systematic review of literature/ Social Support framework/ Obesity Reviews	Anthropometric measures used to assess or bariatric surgery	Weight loss post Bariatric Surgery	Five studies reported on support groups and five studies reported on other forms of social support (such as perceived family support or number of confidants) and degree of post-operative weight loss (total n = 735 patients). Of the 934 screened studies, 10 reported on social support and weight loss outcomes.	The included studies report on 735 patients with a mean age ranging from 34 to 47 years. All studies have a majority of female patients except Song et al. (13), and baseline BMI ranges from 35 to 52 kg/m ² (Table 1). Most studies focus on either open or laparoscopic Roux-en-Y gastric bypass or laparoscopic adjustable gastric banding.	Three studies use validated instruments to assess amount of social support, and one study used a self-developed survey. None of the instruments used is specific to bariatric surgery patients. Delin et al. include the Medical Outcomes Study (MOS) Social Support Survey, which is a self-administered series of 20 questions (23). It has one question to measure structural support (number of close friends and relatives) and four other subscales: emotional/informational support, affection, tangible support and positive interaction. Canetti et al. utilize Receiving Social Support, a 10-item scale that assesses social support provided by the closest person that the patient meets at least once weekly (24). Shiri et al. use the	All four studies report a positive association of support groups on the degree of post-operative weight loss (Table 2). Song et al. report that weight loss between patients who attend support groups vs. those who do not is similar up to 6 months post-operatively, but by 9 months this difference becomes significant (53.6% EWL vs. 45.1% EWL, P = 0.002). This difference is sustained at 12 months. Bakky et al. found that support group patients have significantly greater weight loss starting at 6 months and continuing at 12 months. Hildebrandt et al. note that when controlling for time elapsed since surgery, the number of group meetings attended explains some variance in weight loss (16). This association is not present when predicting weight regained.	Attending support groups appears associated with a greater degree of weight loss following bariatric surgery. The influence of other forms of social support is less clear. A causal association between support groups and weight loss cannot be proven with the types of studies identified in our review as all were observational, cohort studies. However, three of four of the support group studies were prospective and as such suggest that our findings are hypotheses generating and more work in this area is warranted.	Not to self: download articles on support groups and post surgical bariatric outcomes. All studies found a positive association between post-operative support groups and weight loss. One study found a positive association between marital status (being single) and weight loss, while three studies found a non-significant positive trend and one study was inconclusive. Support group attendance at bariatric surgery is associated with greater post-operative weight loss. Further research is necessary to determine the impact of other forms of social support. These factors should be addressed in prospective studies of weight loss following bariatric surgery, as they may represent ways to improve post-operative outcomes.
8	Marck, R., Heinberg, L., Lavery, M. A review of psychological assessment instruments for use in bariatric surgery evaluations	2016, Cleveland, OH, U. S. A.	Review of Assessment Instruments for use in BS evaluation/ Psychological Assessment	Psychometric Summary of Currently Used Psychological Instruments in Bariatric Clinics: Broadband measures, Narrowband measures: depression/anxiety, substance use, eating pathology	BS Outcomes: Regain of weight in particular and behavioral problems post surgery	Article did not state the number of clinics that participated in using the instruments	Bariatric Surgery Clinics BB Instruments: Minnesota Multiphasic Personality Inventory, Beck Depression Inventory, Personality Assessment Inventory, Million Behavioral Medicine Diagnosis, Eating Disorder Examination Questionnaire, Alcohol Use Disorder Identification Test	7 Broadband instruments and the following narrowband instruments-6- depression/anxiety, 3- substance use, 6- Eating pathology instruments	The inclusion of broadband instrument and narrowband instruments are suggested as the foundation of an assessment battery in BS evaluation. Of those reviewed, the MMPI 2-RF and PAI are recommended, ED-E-Q, BES, or NEQ are the narrowband recommendations	50-60% of BS Clinics include an objective psych instrument as part of the evaluation battery. The American Association of Clinical Endocrinologists (AAACE), the American Society for Metabolic and Bariatric Surgery (ASMBS) and The Obesity Society (TOS) Guidelines for the Clinical Management of Bariatric Surgery Patients in addition to the guidelines set forth by the National Institute of Health 19991.	

17	Martínez, E., González, S., Vicente, M., Roman, C., Rodríguez-Marín, J./ Psychopathology in a sample of candidate patients for bariatric surgery	2013, Alicante, Spain	Descriptive Correlational, Cluster analyzed/Ward's hierarchical method/ International Journal of Psychiatry in Clinical Practice	Age, BMI, marital status, education, employment	Depression, Anxiety, (schizotypal, borderline, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), self-defeating, three severe personality pattern scales (schizotypal, borderline, paranoid); seven moderately severe clinical syndrome scales (anxiety disorder, somatoform disorder, bipolar-manic disorder, ??	50 patients attending, 19 male, 13 female	Subjects ranged in age from 23 to 59, with a mean of 43 (SD = 9.6), a body mass index (BMI) ranging from 36.7 to 67.5 kg/m ² (M = 48.4, SD = 6.4), and weight from 96 to 202 kg (M = 131.7 kg, SD = 22.2). Fifty percent of subjects were between the ages of 35 and 50; 78% of the subjects were married, 22% single, and 10% separated/divorced. The majority of participants had completed elementary school (52%), 26% high school diploma, 14% reported a university level education, and 8% reported that they have not any school level. Approximately 65% of the sample is not working, including unemployed, on sick leave, retired, student, and housewife. Forty	Millón Clinical Multiaxial Inventory-III (MCMI-III), State/Trait Anxiety Inventory (STAI) by Spielberger, Gorsuch, and Lushene, Beck Depression Inventory (BDI). All instruments were in the Spanish version and all have been reported in the article, dimensions measured, validity and reliability Chronbach's alpha reported.	40% of the studied sample suffered from an Axis I clinical syndrome. The most frequent were anxiety disorders (45%); affective disorders were second (32.5%), containing bipolar, dysthymia, and major depression. Somatoform disorders (12.5%) were third. These data are coherent with the psychopathological prevalence the literature describes and are positioned between 20 and 60% of the patient samples seeking BS for obesity [20,43]. Our data also are coherent with the type of syndromes found, since the anxiety spectrum and depressive disorders are the most frequent [9,19,21-23]. In particular, affective disorders are the most frequent in lifetime prevalence (45.5%), whereas anxiety disorders are the most prevalent in the preoperative assessment (24.0%) [7].	Several analyses were run to test the validity of these clusters. First, a confirmatory multivariate analysis of variance (MANOVA) was performed using the three clusters as criterion. The MANOVA used the MCMI-III clinical syndrome scales (listed in Table III) as the set of dependent variables. The hypothesis of no overall cluster effect was rejected (P=0.000). Thus, significant differences exist among the three clusters with respect to the set of variables. Next, a set of analyses of variance (ANOVAs) was performed to look for differences in individual measures, exhibiting significant differences among clusters across almost all the outcome measures (Table III).	Cluster analysis was carried out on the MCMI-III personality scales to identify homogeneous groups of patients with similar profile patterns. Clusters were derived by Ward's hierarchical method, which is one of the most used in the literature and is more capable of finding the optimal classification than other methods [40]. The squared Euclidean distance being the measure of proximity between pairs. Due to sample size and the number of variables, we looked for a solution of two to three clusters. Previous analysis of data included a normality test for the distribution of each variable, the determination of outliers, and data standardization. Treatment of missing data was not required, since the database was complete. Univariate normality was analyzed using the Kolmogorov-Smirnov test for each distribution. In all cases, the assumption was verified. An outlier was detected in the narcissistic scale, which was excluded from the analysis.
3	McCarthy, H. Weight loss surgery and improvements in the psychological profile of obese patients: a literature review	2015 U. K.	Grey Literature review/ Gastrointestinal Nursing	??	??		Adults >18 years old, BMI of 30 or >. Any type of bariatric surgery procedure, maladaptive eating behaviors, disordered pre-eating behaviors, psychiatric conditions			318 articles down to 73 down to 50 and finally 31	All the articles suggested the need for early psychological interventions postoperatively. Bariatric patients are associated with having high levels of disturbed eating patterns nonspecific eating disorders. All highlight the need of change follow-up care to identify postop eating disorders
10	Munzberg, H., Laque, S., Yu, K., Rezaei-Zadeh, Berthoud, H.R. Appetite and body weight regulation after bariatric surgery	2015, Baton Rouge LA, U.S.A.	Interpretation of literature non-systematic review attempt to highlight contributing factors/ Obesity Reviews	Energy expenditure (EE), Energy intake, weight loss phase and weight maintenance/regain phase BMR, basal metabolic rate (BMR), gastric bypass; NA, not applicable; REE, resting energy expenditure; RYGB, Roux-en-Y gastric bypass; SMR, sleeping metabolic rate; TEE, total energy expenditure; VBG, vertical banded gastroplasty; VSG, vertical sleeve gastrectomy.	Changes in appetite and body weight regulation	humans and rodents. Exact numbers were not disclosed in the article	BS patients and BS rodents	Weight, caloric intake. The study did not identify which standard instrument were used to determine the measurement of energy intake and appetite	Drastic reduction in energy intake and its consequences on body weight are mainly responsible for the rapid improvement of glycaemic control and resolution of diabetes. Therefore, the acute hypocaloric state during the initial weight loss phase is an important research target to understand its underlying mechanisms. Feeding the same low-caloric diet ingested by RYGB patients to non-surgical control subjects results in rapid body weight loss		If the initial reduction of food intake and weight loss is one key effect of bariatric surgery, maintenance and defence of this reduced body weight level is the other one. This is in stark contrast to caloric restriction-induced weight loss, which is followed by hyperphagia and prompt weight regain, even if pre-intervention weight was in the obese range. Successful bariatric surgery and particularly RYGB appears to neutralize the powerful counter-regulatory mechanisms that are engaged by weight loss. The major counter-regulatory response to weight loss, increased hunger, seems to be offset or defused after RYGB. Why do RYGB patients not return to pre-surgical levels of food intake to regain preoperative body weight? Why do rodents not become hyperphagic to regain preoperative body weight?
4	Natvik, E., Gjengedal, E., Rahern, M. Totally changed, yet still the same: Patients' lived experiences 5 years beyond bariatric surgery	2013 Norway	Phenomenological lifeworld perspective, qualitative, descriptive and retrospective design/ Qualitative Health Research	Coping, habits, practices, social interactions	Long term weight loss maintenance	8 participants	Adults male and female ages 30-55 of Norwegian ethnicity. Weight loss of >40 kg (88 lbs), 5-7 years post bariatric surgery, combined bariatric procedure duodenal switch		BS entailed a long-desired rapid and excessive weight loss and improvements in health, function, and social interaction	The core dimensions were 'the altered body	Four broad themes covered during the interview. Perceived health, each participant's own body, health-related habits and practices, participation in society. Key terms: BS= bariatric surgery
1	Ogden, C., & Carroll, M. Prevalence of Overweight, obese, and extreme obesity among adults US trends 1960-1962	2010 U.S.A.	Retrospective Quantitative/ National Center for Health Statistics/ CDC	Race, height, weight, age, gender	BMI Obesity	16,679	Adults male and female. Civilian noninstitutionalized populations, pregnant women and those missing valid health and weight	National Health and Nutrition Examination Survey (NHANES)	34.2% of US adults aged 20 years and over are overweight, 33.8% are obese, and 5.7% are extremely obese		

Parikh, M. Dasari, M. McMacken, M. Ren, C. Fielding, G. Ogendegbe, G. Does a preoperative medically supervised weight loss program improve bariatric surgery outcomes? A pilot randomized study	2012 NY, U.S.A.	Pilot randomized trial/ Surgery Endoscopic	BMI, Medication adherence, eating behavior change, patient activation/health (PAM-instrument), physical activity	Post surgical EWL- estimated weight loss	55 patient enrolled with follow up after 6 months on 23 patients	Majority female, non-Caucasian, mean age was 46 years, average income <\$20,000/year on Medicaid and consistent demographics of the hospital's bariatric surgery program	the 13-item patient activation measure (PAM) which involves four stages: 1 believing the patient role is important, 2 having the confidence and knowledge necessary to take action, 3 actually taking action to maintain and improve one's health, and 4 staying the course even under stress. Increases in the PAM score are related to positive change in a variety of self-management behaviors	Total of 55 patients enrolled into study; 29 were randomized to MSWM and 26 go usual care. Significant drop out from the study- Fisher's exact test used to compare the groups 10=MSWM 13=Usual care. No difference in compliance rates. 2 sessions average attendance. The treatment group no difference was seen in mean BMI, medication adherence, eating behavior, patient activation score, and physical activity level. In the usual care group, larger decrease in BMI than the MSWM group. The original groups were combined for purposes of statistical analysis. T-test were used to compare continuous data such as weight patient adherence, and health beliefs. Fisher's exact tests were used to compare eating behavior and activity level. A p value of <0.05 was used as the criteria for statistical significance	The sample size was assessed by calculating Key terms: MSWM-Medically Supervised Weight Management, Medicaid, Gastric band, BS, LAGB-Laparoscopic Adjustable Gastric Banding. GREAT EXPLANATION OF STATISTICAL ANALYSIS	
16 Perera da Silva, S., Costa Maia, A. Patients' experiences after bariatric surgery: a qualitative study at 12-month follow up	2013, Portugal	Qualitative with grounded analysis. The basic premise of grounded analysis is that the phenomena comprehension must emerge from the data rather than from preconceived notions formulated by the researcher, questions could be revised to reflect and check the emergent categories/ Clinical Obesity	Socio-demographic data collected: age, BMI, gender, Marital status, education (years), Professional status (employment)		30 obese adults	The participants were 20 women and 10 men (22 gastrobandoplasty and eight gastric sleeve, because those were the patients and bariatric surgical procedures performed during the research period) that were interviewed one month before surgery (Silva & Maia (17)) and 12 months after. The paper will focus on the results of qualitative analysis of the interviews conducted 12 months after surgery.	The interview took place at the hospital. All interviews, which lasted between 20 to 70 min, were audiotaped and transcribed verbatim. The interview schedule included open-ended questions, such as 'At this moment, in what areas do you consider that your expectations were achieved?', and 'How do you describe the treatment process? How do you understand the process after bariatric surgery?'; What were the positive and negative aspects during the last year?; How do you evaluate the last year?.	Data reports participants described themselves as belonging to one of two opposite and separate groups: success or failure. In both groups, two core categories emerged from the data: outcomes and treatment. Previous expectations were reached by the patients who described themselves as successful, with some remaining concerns related to future weight maintenance and aesthetics issues. The failure group emphasized their unmet expectations and the expectancy that surgery would change their lives remained.	Treatment in the successful cases integrated lifestyle changes and bariatric surgery, highlighting the personal commitment required to achieve the objectives. The failure group emphasized bariatric surgery without personal commitment, and healthy eating behaviour was understood as a sacrifice. The post-surgical adaptation experiences were diverse: the cases that were described as a success highlighted lifestyle changes, personal efforts and commitment with the global treatment process. External understanding and the desire for a miracle surgery characterized the cases described as a failure. According to these results, it is necessary to promote adequate information about the whole process and skills required to ensure commitment in all treatment dimensions.	Currently, the reported failure rate of bariatric surgery varies between 10% and 20%, although some authors (9) have pointed out that failure to maintain weight loss occurs in 35% of cases. Reports in the literature have indicated that, 24 months after successful surgery, a decrease in the gains related to bariatric surgery tend to occur (10). Recent studies suggest even higher rates of failure after surgery. For example, DeMaria et al. (11) reported a failure rate of 40% in a follow-up study of 4 years.
5 Rudolph, A. Hilbert, A. Post-operative behavioural management in bariatric surgery: a systematic review and meta-analysis of randomized controlled trials	2013 Germany	Systematic review and meta-analysis of RCT/ Inclusion of observational studies, treatment studies, and nonrandomized and uncontrolled studies were included /Obesity Reviews	Behavioral management, duration of included studies ranged from 2 months to 3 years with half ranging from 6-12 months	Post surgical weight loss	Lit search 404 citations. (16 articles with 15 studies identified. One study published twice measuring at two different times. The included studies reported data on 1008 patients	Adult age >18 years who underwent BS. Predominantly female and only All but 3 studies comprised American samples. BMI > 47.2-51.6		In summary, results indicated a positive effect of behavioral management on weight loss outcomes. Causal Interpret. Could not be inferred from all studies. Health related QOL largely followed changes in weight loss psychosoc. Improvements aside from marked metabolic improvements following surgery	There were no standardized guidelines for	Key terms: maladaptive eating patterns. A more refined analysis of patient characteristics associated with decreased adherence would help identify those with an increased need for the post-op behaviour management. Research should focus on those aspects. With poor weight loss or weight regain but differentiate between those with current psychopathol. and those without as they might be in need of diff. interventions.

18	Sjostrom, L, Lindroos, AK, Peltonen, M, et al./ Ten years after bariatric surgery: weight loss sustained, diabetes and hypertension reversed	2004, Sweden	Non-randomized controlled trial/ New England Journal of Medicine	Anthropometric measures used to assess or bariatric surgery, hypertension, diabetes, and triglycerides	>2 years post-operative weight loss, hypertension, diabetes, triglycerides	n=4047	??? Not to self; need to download this article	???	Bariatric surgery successfully helps patients lose weight and reverse diabetes, hypertension, and some hyperlipidemias. We still do not know whether it affects all-cause mortality	The operative mortality rate was 0.25% and the rate of serious surgical complications was 13%. Weight loss peaked after 1 year in the surgery group (36% for gastric bypass, 27% for vertical banded gastroplasty, and 21% for banding). Weight loss at 2 years was an average of 23% for the surgery groups compared with a 0.1% increase in the control group. After 10 years, weight loss was less dramatic (25%, 16%, and 13% for the 3 different procedures), but still better than the 1.6% gain in the control group. At both 2 and 10 years, surgical patients were significantly more likely than controls to have recovered from diabetes (36% vs 13%), hypertension (19% vs 11%), and hypertriglyceridemia (46% vs 24%). There was no difference at either 2 or 10 years in the rate of recovery from elevated total cholesterol.	The type of surgery was determined by the physicians at the center. Each patient was matched at the time of surgery with a patient from the control pool based on age, obesity, comorbidities, and other clinical factors. Patients were then followed-up for up to 10 years. Thus, this was not a randomized trial.
7	Tayem, RM, Atkinson JM, Martin CR Development and validation of new bariatric specific health-related quality of life instrument- Bariatric and Obesity Specific Survey (BOSS)	2014, U.K.	Instrument Validation study/ Journal of Postgraduate Medicine			The BOSS-91 was administered to 300 but only 236 participants responded	Mean age 43-45, females >63.5% in all 3 groups, All groups reported > 0.7 Comorbidities. Group 1 BMI=48.4, Group 2 BMI=39, Group 3 BMI=29.4	Health Related Quality of Life (HRQOL), Short form Helath Survey SF-36, Hospital Anxiety and Depression scale (HADS), Moorehead-Arden QOL Questionnaire (MAQOLII)	BOSS appears to be a valid and reliable instrument internal consistency reliability (Cronbach alpha = 0.97) test-retest reliability (ICC=0.926), construct validity, criterion validity, and face validity and acceptability	Three groups: Group 1-patients who were	Key terms bariatric specific instrument, BS, factor analysis, health related quality of life, reliability validity. Internal consistency reliability for BOSS 42 and its 6 domains is satisfactory: BOSS 42, Incapacity, Work and wellbeing, Social Function, Appearance and health, Eating patterns, Sexual health GOOD INSTRUMENTS mentioned
21	Taube-Schiff, M, Chaparro, M, Gougeon, L, Shakory, S, Weiland, M, Warwick, K, Plummer, C, Soekling, S. Examining nutrition knowledge of bariatric surgery patients: What happens to dietary knowledge over time?	2015, Toronto, Canada	Descriptive correlational longitudinal design	Anxiety, depression, demographic relationship status education occupation status	Nutrition knowledge in bariatric patients over time (1 month)	153 participants recruited, 119 completed all study measures and 34 did not complete the study.	Gender Female 89.74.8 Male 30.25.2 Type of surgery Roux-en-Y 103 Sleeve gastrectomy 14 Race/ethnicity (n=63) White 50.79.4 Black 2.3.2 Asian 5.7.9 Hispanic 5.7.9 Aboriginal 1.1.6 Relationship status (n=66) Married 39.59.1 Common-law 7.10.6 Divorced 2.3.0 Separated 1.1.5 Single, never married 15.22.7 Widowed 2.3.0 Educational status (n=64) Some school 3.4.7 High school graduate 14.21.9 Some college 8.12.5 College diploma 25.39.1 Some university 5.7.8 Bachelor's degree 6.9.4 Graduate degree 3.4.7 Occupational status (n=66) Full-time 48.72.7 Part-time 6.9.1 Unemployed 3.4.5 Retired 6.9.1 Disability 3.4.5	Generalized Anxiety Disorder Scale and Patient Health Questionnaire that assesses significant depressive symptoms	A total of 153 participants were recruited for this study. One hundred and nineteen participants completed all study measures (77.8% completion rate), and 34 participants did not complete the study. There were no significant differences between study completers (n=119) and study non-completers (n=34) in terms of gender, age, and pre-surgery BMI.	Non-completion primarily occurred as a result of patients not attending the 1-month post-op appointment. Time in between the nutrition education class and individual nutrition appointment was 63.4 days (SD=46.7; range=-10.0 to 323). From this analysis, we did exclude significant outliers (n=11) (i.e., negative values about 100 and any occurrence in which the nutrition education class and individual nutrition appointment occurred on the same day as these are extremely unique situations and are not part of standard care at this time in the clinic).	