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Obesity may be defined as a state in which an individual has accrued an excess amount of body fat that may be dangerous for one's overall health (CDC, 2015; Flegel, Carroll, & Ogden, 2012). One treatment option for obesity is bariatric surgery, which has been found to be effective when a large amount of weight loss is necessary (ASMBS, 2015). Physical activity participation has also been found to be a viable adjunctive treatment for weight management, decreasing disease risk, and improving overall quality of life for those who undergo bariatric surgery (Coen & Goodpaster, 2016; Hunt & Gross, 2009; Steele, Cuthbertson, & Wilding, 2015). Current research has demonstrated the use of Social Cognitive Theory (SCT) intervention in conjunction with exercise to increase self-efficacy while promoting exercise adherence and behavior change (Annesi & Gorjala, 2010b). However, there is a gap in literature on physical activity combined with behavioral intervention as a means of weight loss and lifestyle change for these individuals. The Bariatric Exercise Lifestyle Transformation (BELT) program is designed to help overweight and obese individuals adopt a physically active lifestyle by learning to exercise safely and effectively. Little research has been conducted regarding the use of psychological skills to increase positive self-perceptions, self-efficacy for exercise and the transition from the 16-week BELT program to lifestyle physical activity. Therefore, the Following a Lifestyle of Wellness (FLOW) program has been developed as the behavioral component of the BELT program and includes 16-weeks of psychological skills education and practice. FLOW is based on SCT (Bandura, 2004), and includes

psychological and behavioral strategies designed to increase self-efficacy and the motivation to maintain a healthy lifestyle, as well as identifying the means to overcome potential barriers and avoid relapse. This study examined the effectiveness of the FLOW intervention aimed at increasing self-efficacy and positive self-perceptions while encouraging physical activity maintenance in a bariatric population, and explored the practicality of implementing the FLOW intervention into the existing BELT program. As part of a feasibility study, 11 participants (10 females and 1 male) completed the FLOW program. A variety of data sources were used to assess the effectiveness of the program including self-report questionnaires, intervention evaluations, and semi-structured interviews. Results indicated participants enjoyed the program and felt an increased sense of confidence and readiness to continue with a physically active lifestyle upon program graduation. Interviews indicated that individuals believed the FLOW program was effective for increasing positive self-perceptions, learning psychological skills necessary for behavior change, and improving motivation to exercise. The most effective psychological skills sessions were found to be goal setting, future preparation and planning, and stress management. Participants noted the support and accountability from the program facilitator enhanced their experience, and suggestions for improvement were also provided. This information can be used to improve the FLOW program moving forward. The findings of this study will not only benefit the existing BELT program, but serve as foundational for the development of similar programs in other bariatric and clinical settings.

AN EXAMINATION OF A PSYCHOLOGICAL SKILLS INTERVENTION  
IN AN EXERCISE PROGRAM FOR OVERWEIGHT  
AND OBESE INDIVIDUALS

by

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Approved by

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Committee Chair

To my parents. I promise to always keep shooting baskets in the rain.

APPROVAL PAGE

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## CHAPTER I

### INTRODUCTION

Obesity may be defined as a state in which an individual has accrued an excess amount of body fat that may be dangerous to their overall health. It is found that a consistent positive energy balance (i.e. ingesting more calories than those being burned) leads to weight gain and increased risk for chronic and life-threatening diseases (Ross & Janssen, 2012). In recent years, obesity has become a worldwide phenomenon which continues to increase as time progresses. Currently, 66% of adults in the United States are classified as overweight and 34.9% are classified as obese (CDC, 2015; Flegal, Carroll, & Ogden, 2012). Obesity carries an increased risk for cardiovascular disease, dyslipidemia, type II diabetes, stroke, and certain types of cancer (CDC, 2015; Ross & Janssen, 2012). While it has been identified as one of the most preventable diseases, the prevalence of obesity continues to rise. It is projected that at the current rate, by 2030 86.3% of U.S. adults will be classified as overweight and 51% of adults will be classified as obese (Wang, Beydoun, Liang, Caballero, & Kumanyika, 2008). Various types of treatment for obesity have been identified, including lifestyle modification (diet, physical activity) with standard behavioral therapy, pharmacological intervention, and bariatric surgery (ASMBS, 2015; Adams et al., 2012; Alverdy, Prachand, & Flanagan et al., 2009; Burke & Wang, 2011; Gagnon, & Sheff, 2012).

The benefits of physical activity for weight management, decreasing disease risk, and improving quality of life in overweight and obese individuals are well established (CDC, 2015; Morgan et al., 2014; Ross & Janssen, 2012), yet a vast majority of the population (66%) consistently fails to meet the recommended activity guidelines (CDC, 2015). Physical activity has been found to be a viable adjunctive treatment for those who undergo bariatric surgery (Coen & Goodpaster, 2016; Hooper, Stellato, Hallowell, Seitz, & Moskowitz, 2007; Hunt & Gross, 2009; Jacobi, Ciangura, Couet, & Oppert, 2011; King et al., 2013; Moya et al., 2014; Steele, Cuthbertson, & Wilding, 2015). Therefore, in effort to combat post-surgery weight regain and a sedentary lifestyle, the use of exercise and behavior change intervention as adjunctive treatments in addition to bariatric surgery is recommended for obese individuals (Jassil et al., 2015; King et al., 2013; McMahon et al., 2006). Social Cognitive Theory has been found to be particularly effective as a framework for promoting lasting physical activity participation and adherence (Bandura, 2004; Brawley et al., 2012; Morgan et al., 2014, Palmeira et al., 2007).

Bandura's (2004) Social Cognitive Theory (SCT) has been used in efforts to facilitate lasting behavior change in exercise settings. This theory posits that individuals have the ability to change behaviors through increasing self-awareness, implementing self-regulatory skills, setting goals, and exhibiting the intent and motivation to make changes. The main components of SCT include outcome expectancies, outcome values, self-efficacy, intentions to change behavior, and triadic reciprocity. Outcome expectancies involve an individual's appraisal of the effectiveness of an intervention to change behavior along with the costs and benefits of engaging in a certain behavior.

Outcome values are determined by the individual's perceptions of potential positive or negative results of engaging in a certain behavior, and can be influenced by internal and external factors (i.e. personality characteristics or rewards). Triadic reciprocity indicates that personal, environmental, and social factors should be taken into consideration when implementing interventions to change behavior using SCT. Finally, intentions include the individual's level of readiness to make a change and may be influenced by levels of self-efficacy, or perceptions of competence and confidence in being able to successfully carry out a certain task. SCT emphasizes that behavior is determined by interrelated factors of the person and the environment, and therefore a holistic view from multiple perspectives is optimal for lasting behavior change. As a key component of SCT, self-efficacy is a foundational aspect of the present study.

Self-efficacy may be developed through modeling and experiences, and is strengthened through mastery experiences (previous accomplishments), vicarious experiences (watching others succeed), verbal persuasion (positive encouragement or feedback), and the interpretation of physiological arousal (i.e. anxiety or perceived exertion). Mastery experiences have the largest impact on one's feelings of efficaciousness in certain situations, and should therefore be included in any behavioral change intervention program to increase participant chances of adherence (Bandura, Adams, & Beyer, 1977). Perceived barriers such as lack of time due to school or work, lack of facility access, or feeling anxious exercising in social settings may decrease self-efficacy and deter one from being physically active. Social support, self-awareness, and specific strategies for overcoming perceived barriers are essential for behavior change.

SCT focuses on increasing self-efficacy and cognitive awareness thereby facilitating the behavior change process (Bandura, 2004).

Current research has demonstrated the use of SCT and self-efficacy interventions can promote exercise adherence and behavior change. Women with Class III obesity improved their physical self-concept, exercise barriers self-efficacy, body satisfaction, and mood after an exercise intervention using goal setting and progress tracking (Annesi & Gorjala, 2010b). Educational information sessions on behavioral change skills (i.e. goal setting, self-confidence, overcoming barriers) in addition to exercise also improved self-regulatory skills, self-efficacy, mood, and nutritional habits (Annesi & Gorjala, 2010b; Morgan et al., 2014; Palmeira et al., 2007). Individuals who feel they have conscious control over their behaviors regarding nutritional and exercise habits demonstrated higher levels of exercise adherence and healthier eating behaviors than those who felt they lacked autonomy and behavioral control (Hunt & Gross, 2009). Self-efficacy interventions have also been explored within cardiac rehabilitation settings and were found to be beneficial for increasing patient self-efficacy over the course of a 12-week exercise program. The use of positive reinforcement for exercise behavior, providing motivational resources, and educational information for overcoming perceived barriers increased patient self-efficacy throughout the rehabilitation programs (Vibulchai, Thansilp, & Preechawong, 2016; Carlson et al., 2001; Song, 2003). However, several studies (Hunt & Gross, 2009; Kalarchian & Marcus, 2015; Paul et al., 2015) indicate a gap in research exists in examining the use of a SCT-based psychological skills intervention among a bariatric population. An additional aperture in this literature is

related to making a transition into maintenance of behavior change upon completion of an intervention period. Previous SCT-based studies (Brawley et al., 2012; Morgan et al, 2014) suggested that future research focus on bolstering self-efficacy throughout the intervention in efforts to facilitate lasting physical activity adherence. Therefore, the current project focuses on using SCT as a framework by implementing specific interventions for increasing self-efficacy among a bariatric population partaking in a 16-week exercise program and transitioning to lifestyle physical activity.

The Bariatric Exercise Lifestyle Transformation (BELT) program, in collaboration with Cone Health, is designed to help overweight ( $\text{BMI} \geq 25 \text{ kg/m}^2$ ) or obese ( $\text{BMI} \geq 30 \text{ kg/m}^2$ ) individuals adopt a physically active lifestyle. This program has been successfully operating for over six years with high levels of adherence and positive participant feedback. The BELT program is 16-weeks in duration and includes one hour of exercise three days per week for adults. The first 30 minutes of each 60-minute session are devoted to resistance training for increasing muscular strength and flexibility followed by 30 minutes of cardiorespiratory exercise for increasing cardiorespiratory endurance and promoting caloric expenditure. Additionally, the BELT program includes educational sessions on goal-setting, injury prevention, proper exercise technique, and nutrition within the program. However, the current program lacks a theory-based behavioral change intervention. Furthermore, little research has been conducted regarding the use of psychological skills to increase positive self-perceptions, self-efficacy for exercise, and the transition from the 16-week BELT program to lifestyle physical activity. Therefore, the Following a Lifestyle of Wellness (FLOW) program was

developed as the behavioral component of the BELT program in efforts to increase participant self-efficacy for exercise, positive self-perceptions, and the transition to physical activity maintenance.

The FLOW intervention includes educational sessions on psychological skills important for exercise adherence (i.e. goal setting, relapse prevention, planning for the future, overcoming barriers, building self-confidence, and promoting healthy body image perceptions). This program is designed to help participants gain the tools and knowledge to continue exercising upon graduation from the BELT program through the use of SCT-based interventions. Consistent practice of mental skills over time promotes increased self-awareness and further facilitates lasting behavioral change (Buckworth et al., 2013; Murphy, 2005). It has been found that goal setting is particularly effective for increasing self-efficacy and exercise adherence (Bandura, 2004; Morgan et al., 2014; Palmeira et al., 2007). The techniques of setting specific, measureable, and time-based goals for both short and long-term durations, and examining potential barriers and highlighting resources for overcoming them have consistently been found to be effective for promoting physical activity adherence and behavioral change (Buckworth et al., 2013; Burton & Weiss, 2008; Locke & Latham, 1990; Murphy, 2005). Research has also shown SCT-based interventions are effective at increasing self-confidence and positive body image perceptions (Alqout & Reynolds; 2014; Annesi & Gorjala, 2010b; Kubik et al., 2013; Scott, 2005). Teaching effective coping skills will also be helpful for the prevention of relapse or backwards stage progression. Establishing effective coping skills for both problem (external behaviors, changing the situation) and emotion-focused



(internal behaviors, changing thought patterns) situations will help decrease avoidant coping and work to increase self-regulatory skills (Lazarus & Folkman, 1984).

Therefore, the FLOW program takes a theory and evidence-based practical approach to implementing a psychological skills intervention within a bariatric population.

### **Purpose Statement and Research Questions**

Given the aforementioned research indicating the link between SCT, self-efficacy, and physical activity adherence, the purpose of the present study was to examine the feasibility of a SCT-based intervention aimed at promoting positive self-perceptions, increasing levels of self-efficacy, and facilitating the transition to physical activity maintenance among overweight and obese individuals partaking in an exercise program. This study was conducted in the form of a holistic case study (Merriam, 1998) to provide an overall examination of the program's effectiveness for increasing the aforementioned psychological outcomes, as well as to assess the feasibility of implementing the FLOW intervention into the existing BELT program. The insights gained from this research will be useful for implementing exercise promotion strategies in a population of novice adult exercisers in the bariatric population. Research questions of focus include the following:

1. Does the FLOW intervention program enhance participants' exercise self-efficacy, promote positive self-perceptions, and encourage physical activity maintenance?
2. What FLOW intervention strategies and resources are the most effective for enhancing positive self-perceptions and facilitating physical activity maintenance among overweight and obese individuals?

3. Is it feasible to implement the FLOW intervention as currently designed into the existing BELT program?

### **Summary and Organization**

The present chapter outlines the theoretical framework and identifies research questions for the current study examining the self-perceptions of overweight and obese individuals partaking in the BELT exercise program with the FLOW psychological skills intervention. The second chapter provides a review of literature encompassing psychological, sociological, and physiological aspects of obesity. In chapter three, the methodological procedures, framework, processes of data collection, data analysis plans, and potential limitations are discussed. Chapter four discusses the findings of this study including self-report questionnaires, observational notes from the FLOW facilitator, intervention evaluations, and qualitative interviews with participants. Finally, chapter five includes a discussion of these results, which explores connections with previous literature, limitations of the study, and potential future implications.

## CHAPTER II

### LITERATURE REVIEW

This chapter will provide an overview of the literature laying the foundation for the current project. First, obesity is defined and various treatment options for weight loss are discussed including physical activity and bariatric surgery. This is followed by a discussion of the relationship between physical activity and weight loss after bariatric surgery. Finally, a discussion of the behavior change theories relevant to this project is included with a focus on Social Cognitive Theory, which has been found to be particularly effective for producing exercise adherence in previously sedentary and overweight or obese populations.

#### **An Overview of the Relationship between Obesity, Bariatric Surgery, Physical Activity, and Health**

Obesity may be recognized as a condition in which having excess body fat leads to increased risk for disease and mortality while decreasing overall health and quality of life (WHO, 2016). Consistent positive energy balance (i.e. intake of more calories than those being expended) over a prolonged period of time leads to excess weight gain and heightened risk of chronic and life-threatening diseases (Ross & Janssen, 2012). Recent reports from the Centers for Disease Control (CDC, 2015) indicate that 66% of adults are classified as overweight and 34.9% as obese. The amount of excess body weight increases risk for diseases such as cardiovascular disease, type II diabetes, hypertension,

cancer, and stroke (CDC, 2015; Ross & Janssen, 2012). This growing phenomenon of obesity has been recognized as treatable through various options including behavior modification and lifestyle change, physical activity, pharmacological intervention, or weight loss surgery (Burke & Wang, 2011). The following paragraphs will discuss the different types of obesity treatment, in addition to the psychological and physiological outcomes associated with weight loss.

## **Obesity Identification**

### **Obesity Measurement**

The World Health Organization uses body mass index (BMI) as the standard unit of measurement in classifying weight of individuals. These recommendations are used by medical health professionals and researchers alike and include the following BMI classifications: Underweight ( $<18.50 \text{ kg/m}^2$ ; Normal range:  $18.50\text{-}24.99 \text{ kg/m}^2$ ; Overweight  $\geq 25.00 \text{ kg/m}^2$ ; Obese  $\geq 30.00 \text{ kg/m}^2$ ; Obese class I,  $30.00\text{-}34.99 \text{ kg/m}^2$ ; Obese class II,  $35.00\text{-}39.99 \text{ kg/m}^2$ ; and Obese class III  $\geq 40.00 \text{ kg/m}^2$  (WHO, 2016). In addition to BMI classification, Ross and Janssen (2012) identified the use of body fat percentage as a determinant of obesity. Having a body fat percentage of greater than 25% in men and 30% in women indicates an obese body composition. In conjunction with body fat percentage, a waist girth measurement may be taken which identifies the distribution of adiposity. Those with a waist girth of  $>102\text{cm}$  for men and  $>88\text{cm}$  for women are identified as obese. This is a product of having a greater amount of adipose tissue around the midsection of the body, which increases the risk for obesity-related comorbidities (Flegel et al., 2012; Ross & Janssen, 2012).

## **Psychological and Social Ramifications of Obesity**

While it is well known that excess weight has negative physical effects on one's health and wellness (CDC, 2015; Flegel et al., 2012; Ross & Janssen, 2012), quality of life may also be impacted as a result of obesity (Annesi & Gorjala, 2010a; Kubik et al.; 2013). In present society, an individual who is overweight or obese may be subject to a variety of negative stigmas and stereotypes. Particularly in women, it has been found that excess weight leads to decreased body satisfaction, negative affect, feelings of shame and social pressure to lose excess weight, social anxiety, and decreased quality of life (Alqout & Reynolds, 2014; Annesi & Gorjala, 2010a; Wee et al., 2013). Additionally, extremely obese individuals (BMI > 40 kg/m<sup>2</sup>) are five times more likely to have suffered from a major depressive episode in the past year as opposed to their normal weight counterparts (Kubik et al., 2013). Therefore, interventions aimed at improving both physical and psychological health are essential in improving the overall quality of life of overweight and obese individuals (Martinez et al., 2010; Morgan et al., 2014).

Obesity has effects not only on individual psychological levels, but is connected to social situations as well. Schlenker and Leary (1982) introduced self-presentation theory, or the idea that people make an attempt to influence the perceptions of those around them. Individuals may bring special attention to certain aspects of the self that they are fond of (personality aspects or accomplishments) while deemphasizing others that cause particular amounts of stress or anxiety (i.e. physique or body image). Cognizance of the perceptions others have of us can often cause anxiety of behavior or performance in social settings, which may lead to feelings of inferiority thereby

decreasing one's self-esteem. The awareness of the interaction between one's own self-perceptions and the perceptions of those around them in a social setting can cause feelings of anxiety to occur and elicit the response of having self-presentational apprehensions.

One particular form of anxiety that often may occur within overweight and obese individuals is Social Physique Anxiety (SPA). Defined by Hart, Leary, and Rejeski (1989), SPA occurs when an individual experiences feelings of anxiety and/or fear while having his/her body on display. This has been found to be particularly prevalent in exercise settings (Leary, 1992) due to the nature of form-fitting exercise apparel and constant comparison to others (Crawford & Eklund, 1994; Crocker et al., 2006; Focht & Hausenblas, 2004; Russell, 2002; Russell & Cox, 2003). Individuals who feel as though they are overweight, lack muscle tone, or feel inferior to those around them may experience decreased confidence, feelings of unease, and in extreme cases may avoid exercise settings altogether (Hausenblas, Brewer, & Van Raalte, 2004). SPA has also been linked to self-efficacy, or feelings of competence and confidence regarding one's ability to successfully complete tasks, improve self-confidence, and adhere to behavioral change (Bandura, Adams, & Beyer, 1977). An inverse relationship between SPA and self-efficacy has been found among both men and women, as those with increased levels of self-efficacy felt more confident displaying their bodies in social situations (Rothberger et al., 2015). These findings may have important implications for designing exercise interventions aimed at increasing self-efficacy and decreasing social anxiety among bariatric surgery patients and overweight and obese individuals alike.

## **Obesity Treatment**

### **Physical Activity**

Engaging in routine physical activity has numerous health related benefits. Being physically active can decrease chances for obesity-related comorbidities such as risk for hypertension, type II diabetes, dyslipidemia, cardiovascular disease, and certain types of cancers (Baillot et al., 2015; CDC, 2015; Ross & Janssen, 2012). Physical activity has also been found to improve mental health, quality of life, and physical functioning in addition to encouraging weight control (CDC 2015; Morgan et al., 2014). While these benefits are widely recognized, only 21% of adults currently meet the current physical activity guidelines (CDC, 2015). These recommendations were defined by the United States Department of Health and Human Services (2008) to include 150-300 minutes of moderate physical activity or 75-150 minutes of vigorous intensity physical activity weekly along with flexibility and strength training for health benefits and weight maintenance. The Institute of Medicine (2002) expanded upon these guidelines to indicate that 60 minutes or more of moderate physical activity should be obtained in order to promote weight loss in overweight and obese populations. Reduction of sedentary time, caloric monitoring, and increased planned and lifestyle physical activity combined are recommended as the optimal prescription for weight loss and maintenance over time (Pescatello, Arena, Riebe, & Thompson, 2013).

While these guidelines for the amount of physical activity have been established for health benefits and weight loss, there is evidence that any amount of physical activity can be beneficial in decreasing one's mortality risk. The Harvard Alumni Study

(Paffenbarger, Wing, & Hyde, 1978) examined relative risk and all-cause mortality by gradients of physical activity. This study included 10,269 male Harvard alumni, age 45-84. Leisure-time physical activity was assessed up to eight years of follow-up, and a dose response gradient was shown up through 2,500 kcal/week, meaning that the risk of mortality decreases through this level and then evens out. This was one of the leading studies with a large sample size to show the importance of physical activity in decreasing mortality, and also has important implications for the 2008 USDHHS Physical Activity guidelines. About 1,000-2,000 kcal per week expenditure was found to be significant in reducing mortality risk in men, which correlates to the 150-300 minutes of moderate intensity exercise or 75-150 minutes of vigorous exercise per week recommended by the 2008 Physical Activity guidelines (USDHHS, 2008).

Similarly, the Aerobics Longitudinal Study (Blair et al., 1989) used maximal graded exercise tests with a large sample of men and women to assess physical fitness as opposed to leisure time physical activity. A dose response trend was found with greatest differences seen between two lowest fitness categories. Results show that from most fit to least fit groups the relative risk of mortality increases as fitness decreases. In the second least fit and least fit groups, relative risk of mortality doubles. For men or women, the biggest difference for premature mortality comes between the lowest fit quintile and the second least fit fifth. Therefore, it was found that some exercise has greater benefits than no exercise.

Research has shown that no specific physical activity guidelines regarding type, duration, frequency, or intensity of exercise have been established for obese individuals



(Baillot et al., 2014). Regarding the unique nature of this population, it may be beneficial for specific guidelines to be created in efforts to increase the amount of individuals utilizing exercise as a form of weight control and to maximize health benefits. For this to occur, the differentiation between physical activity and physical fitness must be defined. Physical activity is defined as the use of the musculoskeletal system that results in energy expenditure. In contrast, physical fitness may be defined as being able to complete daily tasks without tiring and the ability to partake in leisure time activities and respond to unforeseen emergencies effectively. In sedentary individuals, the prevalence of lower physical fitness levels results in decreased ability to carry out activities of daily living and thereby decreases quality of life (Baillot et al., 2014; Ross & Janssen, 2012). It has been demonstrated that gradual progression of physical activity in this population will be the most effective in promoting exercise adherence. Participants should begin with intermittent bouts of cardiovascular exercise as they are able, and incrementally progress toward 30-60 minutes of continuous exercise daily (Pescatello et al., 2013). Therefore, interventions designed at increasing physical activity in overweight and obese populations should be tailored to include such recommendations.

### **Bariatric Surgery**

Weight loss surgery has become an increasingly popular option for the treatment of obesity. Bariatric surgery is considered one of the most effective weight loss treatments for extreme obesity (Adams et al., 2012; Alverdy et al., 2009; Gagnon & Sheff, 2012; McMahon et al., 2006; Novais et al., 2012). In 1998, it was estimated that 13,365 bariatric procedures were performed in the United States and by 2007, this

number had increased to over 200,000 (Gagnon & Sheff, 2012). By 2013, however, the rate of bariatric surgeries had leveled off at approximately 179,000 procedures completed per year (ASMBS, 2015). Candidates for bariatric surgery include those who are classified with Class III obesity (i.e., BMI > 40 kg/m<sup>2</sup>) or those with Class II obesity (i.e., BMI > 35 kg/m<sup>2</sup>) with one or more significant obesity related comorbidities (i.e. hypertension, type II diabetes, or sleep apnea). These individuals must also have low operative risk, have experienced failure of non-surgical weight loss programs (at least six months to a year of weight loss attempts prior to surgery), be evaluated as psychologically stable, demonstrate motivation to make a lasting lifestyle change, and have no current illegal substance or alcohol abuse (Alverdy et al., 2009; Brethauer, Chand, & Schauer, 2006). Prospective patients receive pre-operative screenings of medical health to gauge surgical readiness and potential risks, receive nutrition counseling in efforts to determine prevalence of eating behaviors and potential for disordered eating habits (Alverdy et al., 2009). An in-depth psychological screening is also completed to assess potential mental health contraindications for surgery (i.e. depression, uncontrolled psychotic disorders), along with identifying the patient's motivation, intentions, potential behavioral obstacles, and affective factors which may influence one's coping abilities and capability to complete surgery and the following steps to adopting a healthy lifestyle (Snyder, 2009).

**Types of bariatric surgery.** Several options for bariatric surgery exist, however due to the invasive nature of the surgery, some options are more widely performed than others. Currently, the most common types of bariatric surgery include the Roux-en-Y

Gastric bypass (RYGB), Laparoscopic Adjusted Gastric Banding (LAGB), Vertical Sleeve Gastrectomy (VGS) and Bilopancreatic Diversion with Duodenal Switch (BPD/DS). Surgery types are classified as either restrictive (i.e., LAGB, VGS) or malabsorptive or a combination of both (i.e., RYGB, BPD/DS).

***Restrictive procedures.*** Restrictive surgeries (LAGB, VGS) decrease stomach size thereby decreasing the quantity of food that can be ingested. The LAGB procedure is currently the second most popular procedure performed in the United States due to the ease of the surgical procedure and fast recovery. This procedure is also the only reversible bariatric procedure due to the option of band removal. Limitations are that it does not send same satiety signal as other surgeries, it is easy for band to stretch out, vomiting is likely, and highly-processed liquid foods can pass through easily, which decreases nutritional value of one's diet. Success rates with this surgery are highly variable as well, with long-term excess weight loss (EWL) from 25-80% with an average of about 50% (Alverdy et al., 2009; Jossart, 2015). VGS is the newest bariatric procedure which is gaining popularity due to highly effective results and safety of the surgery with a low rate of complications. This procedure creates a pouch that divides the stomach into sections. The pouch is then stapled together and the remaining portions of the stomach are removed thereby significantly decreasing stomach size and restricting the amount of food that may be taken in. Limitations with this procedure include the potential for the pouch to stretch out over time, and it is less effective at decreasing obesity-related comorbidities (i.e. type II diabetes, hypertension, arthritis, hypercholesterolemia) than

other bariatric surgery types. Long-term EWL rates with VGS include 65-75% (Jossart, 2015).

***Combination procedures.*** Combination bariatric surgical procedures involve both restriction of food intake volume and malabsorption, which alters the anatomy of the digestive system thereby restraining caloric intake and nutrient absorption. Malabsorptive procedures typically result in the greatest amount of weight loss, but have a high rate of complications as well. The most common type of bariatric surgery is the RYGB procedure, accounting for nearly 85% of cases (Alverdy et al., 2009). In this procedure, the top portion of the stomach is made into a pouch at the end of the esophagus, then part of the small intestine is sliced and attached to the esophageal pouch, allowing a significant portion of the small intestine to be bypassed. The proximal portion of the small intestine is then connected to a lower portion of the small intestine, which allows bile from the liver to enter the digestive tract. This surgery reduces stomach volume and increase the neurophysiological satiety signal, which increases blood plasma concentration of peptide YY and GLP-, leading to greater weight loss and diabetes reduction as compared to the LAGB procedure. RYGB accounts for about 50-70% of EWL over the long term (Alverdy et al., 2009; Brethauer et al., 2006; Jossart, 2015). The fourth surgical procedure is the BP/DS which is also a combination procedure involving removal of the majority of the stomach to create a pouch linking the esophagus to the top of the small intestine. The small intestines are also scaled down so that the duodenum remains attached to the stomach in efforts to facilitate digestion. Therefore, food intake is restricted due to decreased stomach size and is then moved through part of the small

intestines prior to entering the colon which restricts nutrient absorption. Malabsorption is the main success factor in the BP/DS procedure, and this surgery accounts for 65-75% of long-term EWL. This procedure is not as widely performed as a result of the intensely invasive nature of the surgery and high risk for complications. Due to the malabsorptive nature of both the RYGB and BP/DS procedure, nutrient deficiencies are common and therefore proper nutrition is essential for post-surgical weight loss success (Jossart, 2015). Figure 1 depicts the four common types of bariatric surgery previously discussed

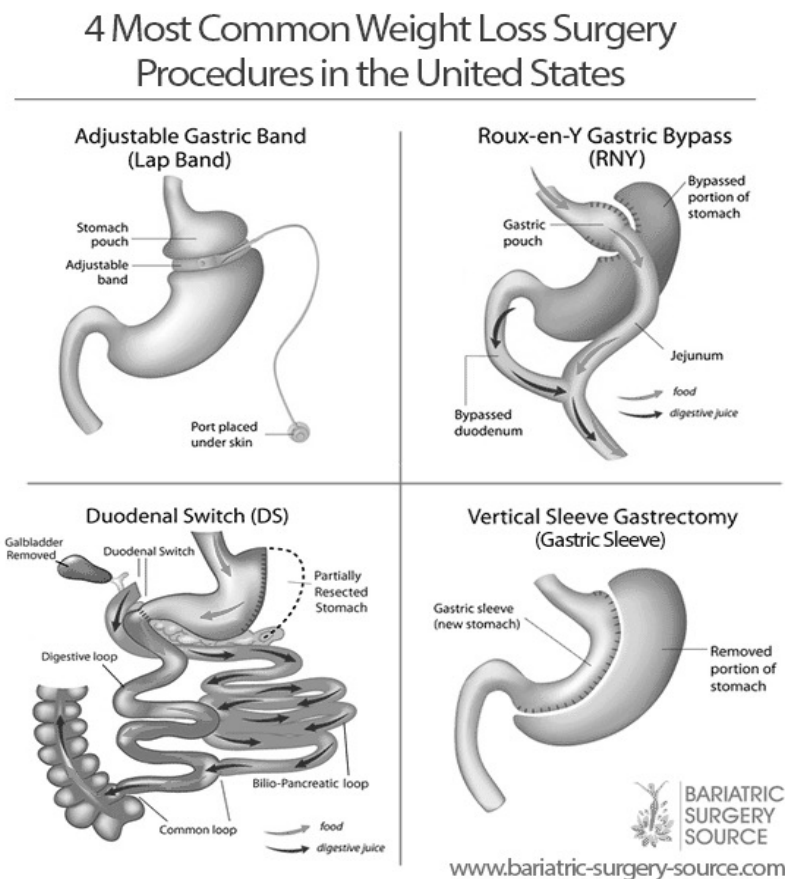


Figure 1. Common Types of Bariatric Surgery Procedures (Jossart, 2015).

**Surgery complications and success.** With any invasive surgical procedure, a variety of complications and risks exist for all types of bariatric surgeries. Common short-term complications include bleeding, wound infection, thromboembolism, band leakage for the LAGB, nausea, vomiting, and “dumping” syndrome (where food is dumped from the stomach into the small intestine without being absorbed properly). Possible longer term complications include ulcers, gallstones, bowel obstruction, and nutrient deficiencies (Brethauer et al., 2006). Due to the restrictive and malabsorptive nature of these surgical procedures, common nutrient deficiencies include iron, vitamin B12, vitamin D, calcium, folic acid, magnesium, and protein (Brethauer et al., 2006; McMahon et al., 2006; Novais et al., 2012). Those who lost less weight in the first year following surgery (EWL < 50%) experienced greater nutrient deficiencies (Novais et al., 2012). It has been found in about 20-30% of patients that those who did not adequately monitor their eating habits post-surgery experienced early weight stabilization or weight regain (Adams et al., 2012). Therefore, proper nutritional education, physician follow-up, and change in eating habits are essential for maintaining a healthy diet for bariatric patients after surgery (Faria et al., 2014; Geraci, Brunt, & Marihart, 2014).

Weight loss success after bariatric surgery involves many factors. Variations in long-term EWL include surgery type, genetics, clinical factors (i.e. prevalence of obesity-related comorbidities or poor mental health), and degree of lifestyle change (Kaplan, Seeley, & Harris, 2012). It is not uncommon for bariatric surgery patients to experience a variety of psychological disturbances post-surgery, including depression, anxiety, psychological eating disorders (i.e. disordered eating habits or Binge Eating Disorder

[BED]), low self-esteem, or lack of perceived control over behaviors (Kalarchian & Marcus, 2015; Kubik, Laffin, & Karmali, 2013; Wimmelmann, Dela, & Mortensen, 2014). For those who undergo bariatric surgery, weight tends to stabilize two years post-operatively, and weight regain is also common (Kubik et al., 2013). Therefore, it has been proposed that lifestyle change interventions may be effective in promoting long-term weight loss and maintenance, improved physical and psychological health, and improved quality of life (Bond et al., 2009).

In a review of literature conducted by Kalarchian and colleagues (2015), it was found that interventions in the post-surgery period were the most effective for making lasting lifestyle changes, as surgery patients had greater motivation to make a change. Paul and colleagues (2015) aimed to explore whether pre-operative interventions aimed at thought and behavior modification may be successful in increasing weight loss and reducing of maladaptive eating behaviors, depressive symptoms, and psychological distress post-surgery. While the use of pre-operative interventions has not been found to be effective in previous literature (Bond et al., 2009), the potential for growth in this area is promising. Many studies have found that quality of life improves as weight is lost after surgery (Batsis et al., 2009; Bond et al., 2006; Warholm, Oien, & Raheim, 2014). Specifically, patients indicated that as physical functioning abilities increased, mood and self-confidence improved as well (Bond et al., 2006; Bond et al., 2012; Warholm et al., 2014). While many post-surgery interventions are based on education and cognitive behavioral techniques, the evidence for physical activity as an adjunctive intervention component is increasing as well.

## **Physical Activity and Bariatric Surgery**

As previously mentioned, the benefits of physical activity for weight loss, maintenance, decreasing disease risk, and improving quality of life are well established (CDC, 2015; Ross & Janssen, 2012), yet a vast majority of the population consistently fails to meet the recommended activity guidelines. Bariatric surgery has been established as a viable treatment for weight loss, but there is a gap in literature supporting the use of physical activity as an adjunctive treatment post-operatively. It has been found that many patients who receive bariatric surgery experience a weight regain, with 33-50% of initial weight loss regained within 12-18 months without proper diet and exercise intervention (Coen & Goodpaster, 2016).

**Improved physical functioning.** Exercise, especially of moderate intensity, has been found to be effective for long-term weight control. Bariatric surgery improves insulin sensitivity and glycemic control, which can be further enhanced when coupled with physical activity. Increases in physical activity also improves muscle strength, muscle endurance, flexibility, and function ability for activities of daily living (Coen & Goodpaster, 2016; Jacobi et al., 2011), and decreased muscle fatigue after exercise bouts as a result of weight loss (Hooper et al., 2007). Particular aspects of physical functioning that consistently improve in bariatric surgery patients as a result of exercise include balance, muscular strength, and cardiorespiratory endurance which lead to improved self-reported quality of life (Steele, Cuthbertson, & Wilding, 2015). Specific exercise recommendations for this population have yet to be established, however, a meta-analytic review by Livhits and colleagues (2010) found that 11 out of 13 studies indicated



physical activity was correlated with greater post-operative weight loss at 12 and 24 months for bariatric surgery patients. Additionally, a meta-analytic review by Moya and colleagues (2014) found that higher volumes of physical activity correlated to greater weight loss in bariatric surgery patients. It was also found that higher intensity physical activity leads to greater weight loss, fat loss, and weight maintenance among post-bariatric surgery patients (Moya et al., 2014). Meeting the established physical activity guidelines (USDHHS, 2008) was also considered important for weight loss and maintenance. Many health benefits have been found from a mere 10% reduction in weight loss. These improvements include decreased systolic and diastolic blood pressure (especially in those with hypertension), improved insulin regulation leading to decreased prevalence or risk of diabetes, improved lipid profile (decreased total cholesterol by 10%, levels of LDL cholesterol by 15% and levels of triglycerides by 30% while increasing HDL cholesterol by 8%), decreased all-cause mortality by 20%, and decreased chance of death as a result of diabetes (>30% decline) and obesity (>40% decline) respectively (Haslam, Sattar, & Lean, 2006). d

**Exercise prescription.** Prior to beginning an exercise program, bariatric surgery patients should be medically cleared to engage in physical activity. This is especially important in individuals with symptoms or prevalence of any cardiovascular or metabolic disease. A health history questionnaire should also be completed and a physical examination is recommended (Pescatello et al., 2013). Focusing on cardiovascular exercise is key for beginners to allow the body to adjust to caloric expenditure and to promote weight loss. Exercise should be started gradually and include low-intensity

modes (such as walking) while being mindful of weight bearing activities for patients with joint pain (Murdy & Ehrman, 2013). Duration of aerobic bouts should begin at 10-20 minutes per session and gradually increase toward the range of 150 to 300-minute weekly recommendation for moderate intensity physical activity or 75 to 150 minutes of vigorous intensity physical activity (USDHHS, 2008) Additionally, targeting at least 60 minutes of moderate-intensity exercise each day is most effective for weight loss and maintenance over time (Institute of Medicine,2002). Resistance exercise should be included as well, while continuing to be mindful of joint pains and range of motion restrictions. Thirty minutes of resistance training two to three days per week is recommended with two sets per major muscle group and a minimum of one minute of rest between sets. Flexibility training including static stretching is also recommended daily for muscle recovery and improved range of motion (Murdy & Ehrman, 2013). Exercise prescription varies for each individual and the plan should be tailored to the desired goals and outcomes for each individual (Pescatello et al., 2013).

**Improved psychological functioning.** As previously mentioned, bariatric surgery patients can experience a variety of psychological distress post-surgery (Kalarchian & Marcus, 2015; Kubik, Laffin, & Karmali, 2013; Wimmelmann, et al., 2014). While psychological distress and disorders are commonly treated pharmacologically, physical activity has been found to be a cost-effective and a less invasive treatment option for stress, anxiety, and depression (Buckworth et al., 2013; Dishman et al., 2012; Weinberg & Gould, 2011), particularly in bariatric surgery patients (King et al., 2013). From a physiological perspective, exercise elicits a stress response in the body, due to the

physiological and psychological demands of engaging in physical activity. The Hypothalamic-Pituitary-Adrenal (HPA) axis is a part of the endocrine system and has multiple functions in the body including regulation of hunger and satiety, sleep, growth, hormonal secretions, and regulation of the physiological response to stress. Stress management is accomplished by providing information to the hypothalamus, pituitary gland, and adrenal gland so the appropriate hormones may be released in response to stimuli the body encounters. During exercise, the HPA-axis is activated which aids in the regulation of cortisol release and reuptake and allows the body to return to homeostatic conditions in a reasonable amount of time after the exercise session concludes. Exercise has been found to positively impact the body's responses to stress via the cross-stressor adaptation hypothesis, which postulates that repeated exposure to exercise will result in increased fitness levels and may be beneficial for coping with stressful experiences that are encountered in situations not including exercise. This hypothesis provides support for the benefits of exercise in regulating depression and cognition (Buckworth et al., 2013). Physiological benefits of exercise, such as increased hippocampal volume, are also beneficial for cognition, memory functioning, and coping with stress, as cortisol levels may be decreased due to more receptor sites on the hippocampus and greater neural signal sensitivity. Additionally, exercise facilitates neurogenesis (new nerve cell production) thereby assisting in HPA-axis regulation and neural pathway development. Angiogenesis (blood vessel growth) is another added benefit of exercise, which is particularly beneficial for increasing blood flow to the amygdala and prefrontal cortex

thereby enhancing emotional regulation, cognitive processes, and improving glucose metabolism (Buckworth et al., 2013; King et al., 2013).

Along with improving the body's reactions to stress, exercise has been found to positively impact the regulation of the HPA-axis in depressed individuals. Repeated activation of the HPA-axis may lead to the development of depression due to increased levels of cortisol secretion. Those who experience depression also have a reduced hippocampal volume, and therefore reuptake of cortisol is decreased to less hippocampal surface area (Crew & Landers, 1987). This can lead to decreased hippocampal neurogenesis and poor adaptation to stressors due to less cerebral blood flow and lessened metabolic activity of glucose in the amygdala and prefrontal cortex. These decreased functions in those experiencing depression lead to lessened neurogenesis thereby resulting in the decreased ability to regulate the HPA-axis and respond to stress. With the knowledge that exercise increases neurogenesis and hippocampal volume while decreasing HPA-axis activity, depressed individuals may highly benefit from engaging in regular exercise. Increased exercise activity would also decrease cortisol secretion and aid in the reduction of depressive symptoms (Buckworth et al., 2013). This has important implications for bariatric surgery patients, as the prevalence of depressive symptoms and psychological distress may increase after surgery (Kalarchian & Marcus, 2015; Kubik, et al., 2013; Wimmelman et al., 2014). Given the aforementioned physiological and psychological improvements experienced as a result of exercise, effective behavioral change interventions should include both physical activity and psychologically based components.

**Psychologically based exercise interventions for bariatric surgery patients.** It is highly recommended that bariatric surgery patients receive educational and exercise interventions after surgery in efforts to facilitate a lasting lifestyle change for weight loss, weight maintenance, and positive health behaviors (Jassil et al., 2015; King et al., 2013; McMahon et al., 2006). Dishman and Dunn (1994) identify both positive and negative behavioral determinants for physical activity. Factors that may deter an individual from engaging in physical activity include older age, gender (females especially), ethnicity (non-white), perceived barriers, low outcome expectancy, low socioeconomic status, low self-efficacy for exercise, pregnancy, being overweight or obese, and lack of education about exercise benefits. Contrarily, positive benefits for exercise include being male, younger in adulthood, higher socioeconomic status, higher self-efficacy, higher motivation for exercise, higher level of education, and lack of perceived barriers. Additionally, perceived barriers have also been determined as personal, psychological, environmental, and demographic. A few common barriers to exercise include lack of time, lack of access to facilities, lack of education about exercise benefits, lack of social support, not enjoying exercise, previous bad experiences with exercise, injury or illness, poor climate conditions, or cost of gym membership or exercise equipment (Dishman & Dunn, 1994). In efforts to increase physical activity promotion and adherence, an examination of the pertinent theories, research, and applied techniques is essential. In efforts to increase physical activity promotion and adherence, an examination of the pertinent theories, research, and applied techniques is essential.

When working with overweight and obese individuals, one must consider all aspects of the person and environment for effective interventions. One theory that is particularly relevant with this population is the Transtheoretical Model (TTM; Prochaska & DiClemente, 1983). For many overweight or obese individuals, becoming physically active is not something they are even thinking about and they are in the contemplation stage. Providing education about the mental and physical health benefits of exercise may encourage the individual to begin thinking about increasing his/her level of physical activity. Once the individual has progressed into the preparation stage and has begun engaging in physical activity, it is important to specifically tailor the exercise to this individual in efforts to foster a positive physical activity climate. This means finding exercises the individual thinks are enjoyable and doable. Pescatello and colleagues (2013) suggest starting with moderate intensity physical activity and gradually progressing upwards towards more vigorous activities after a base level of fitness has been established. This is especially important with previously sedentary individuals, as they may have preexisting injuries or illnesses that might prevent them from executing certain exercises or make performing physical activity uncomfortable. Walking is one of the common activity recommendations for this group. During this time, fostering a sense of social support will be essential for overweight and obese individuals, as it will aid in the creation of a consistent network of accountability, emotional support, and camaraderie. Teaching effective coping skills will also be helpful for the prevention of relapse or backwards stage progression. Establishing effective coping skills for both problem (external behaviors, changing the situation) and emotion-focused (internal

behaviors, changing thought patterns) situations will help avoid avoidant coping and work to increase self-regulatory skills (Lazarus & Folkman, 1984). A common supplement for the TTM is found in the use of Social Cognitive Theory, due to the practical approach and techniques applied to the intervention process.

From a theoretical perspective, Bandura's (2004) Social Cognitive Theory (SCT) posits that cognitions are the basis of human behavior, but can be shaped by social interactions, motivation, and emotions. Behavior is seen as purposeful and is directly controlled by the individual. Self-reflection is an integral part of the behavior change process, as it allows an individual to symbolize, anticipate, and prepare for future outcomes. Behavior in anticipation of receiving rewards is also a part of this planning process. The cognitive mechanisms that drive behavioral change as a part of SCT are goal setting, efficacy expectations, outcome expectations, and outcome values. From this viewpoint, self-efficacy relates to the outcome of successful behavior or the belief one has about successful behavior and therefore is a key element to the behavior change process in SCT.

Self-efficacy may be learned through modeling and experiences, and is strengthened through mastery experiences (previous accomplishments), vicarious experiences (watching others succeed), verbal persuasion (positive encouragement or feedback), and the interpretation of physiological arousal (i.e. anxiety or perceived exertion). Mastery experiences have the largest impact on one's feelings of efficaciousness in certain situations, and should therefore be built in to any behavioral change intervention program to increase participant chances of adherence (Bandura,

Adams, & Beyer, 1977). Effectively using SCT for behavior change of a sedentary individual would be focusing on the skills the individual already possesses as a starting point. For example, helping the individual realize that she already has the ability to walk to the store and back by doing so every day at lunch time will help her to create a mastery experience for walking ability. This foundation may then be used to gradually increase the amount of time she walks each day for exercise. In combination with mastery experiences, it may be beneficial to help the individual find a friend who she can walk with to provide vicarious experiences, verbal persuasion, and social support which each aid in increasing self-efficacy as well. Social support, self-awareness, and means for overcoming perceived barriers are essential in the goal setting process using SCT for lasting behavior change. In SCT, including several means for increasing self-efficacy and cognitive awareness facilitates the behavior change process (Bandura, 2004).

Current research has demonstrated the use of SCT and self-efficacy in conjunction with exercise to promote exercise adherence and behavior change. Women with Class III obesity improved their physical self-concept, exercise barriers self-efficacy, body satisfaction, and mood after an exercise intervention resulting in weight loss (Annesi & Gorjala, 2010b). Educational information sessions in addition to exercise also improved self-regulatory skills, self-efficacy, mood, and nutritional habits (Annesi & Gorjala, 2010b; Morgan et al., 2014). Individuals who feel they have conscious control over their behaviors regarding nutritional and exercise habits demonstrated higher levels of exercise adherence and healthier eating behaviors than those who felt they lacked autonomy and behavioral control (Hunt & Gross, 2009). Self-efficacy has also been



explored within cardiac rehabilitation settings and was found to be beneficial for increasing patient self-efficacy over the course of a 12-week exercise program (Vibulchai, Thansilp, & Preechawong, 2016; Carlson et al., 2001; Song, 2003).

Social environmental factors should also be considered when designing exercise interventions for overweight, obese, and post-bariatric surgery populations. The social ecological model suggests that behaviors are a factor of both the person and the environment, and therefore individual factors (i.e. personal goals, physical functioning level, health and physical activity history) and social/environmental factors (i.e. access to facilities, access to healthcare, amount of social support) must be integrated into intervention designs (Buckworth et al., 2013; Dishman, Heath, & Lee, 2012). Research has shown that bariatric surgery improves body satisfaction and confidence of displaying one's physique in social settings (Alqout & Reynolds, 2014; Kubik et al., 2013; Warholm et al., 2014). Individuals who have undergone bariatric surgery have found greater success in exercise environments providing adequate amounts of social support (Alqout & Reynolds, 2014; Hunt & Gross, 2009; Morgan et al., 2014). Taking these factors into consideration, the most effective exercise interventions for promoting exercise adherence on a social-environmental level will include adequate social support for participants, a gradual progression to meet participants' individual functional abilities and goals, and include exercise environments that are supportive, engaging, and comfortable for participants (Buckworth et al, 2013; Heath, 2013).

Components of effective interventions aimed at behavior change have focused on a few key psychological skills. It has been found that goal setting is particularly effective

for increasing self-efficacy and exercise adherence (Bandura, 2004; Morgan et al., 2014; Palmeira et al., 2007). The technique of setting specific, measurable, and time-based goals for both short and long-term durations, examining potential barriers and highlighting resources for overcoming them has consistently been found to be effective for promoting physical activity adherence and behavioral change (Buckworth et al., 2013; Burton & Weiss, 2008; Locke & Latham, 1990; Murphy, 2005). Research has also shown that supportive, engaging exercise environments are effective at increasing self-confidence and positive body image perceptions (Alqout & Reynolds, 2014; Annesi & Gorjala, 2010b; Kubik et al., 2013; Scott, 2005).

### **Summary**

This literature review provided an overview of the literature concerning obesity, bariatric surgery, physical activity, and health. While not an exhaustive review, the major components of each area are considered with empirical and theoretical support. The exponentially growing prevalence of obesity and need for bariatric surgery may be combatted by the use of physical activity and psychological interventions to promote weight loss and healthy lifestyle adherence. For those who have undergone bariatric surgery, the use of exercise and psychological interventions are highly effective as adjunctive treatments in the adoption of a lasting healthy lifestyle. Gaps in literature exist regarding the duration, intensity, and frequency of exercise that is appropriate for this population, and how physical activity participation, psychological intervention, and social-environmental factors relate to long-term exercise and healthy lifestyle adherence while maintaining weight loss over time. Therefore, future research may want to focus on

developing exercise guidelines for bariatric surgery patients and examining the implications of implementing exercise-based psychological skills interventions for promoting lasting health change.

## CHAPTER III

### METHODS

The purpose of this study was to examine the feasibility of the FLOW intervention program to promote positive participant self-perceptions, increase self-efficacy, and encourage physical activity maintenance among program participants, as well as to assess the practicality of integrating the FLOW intervention as a part of the existing BELT program. A holistic case study approach (Merriam, 1998) examining the FLOW program was taken with this project in efforts to fully understand the effectiveness of the FLOW psychological skills intervention in promoting self-efficacy, positive self-perceptions, and readiness to adhere to a healthy lifestyle upon completion of the BELT program. Through semi-structured interviews, the following research questions were addressed:

1. Does the FLOW intervention program enhance participants' exercise self-efficacy, promote positive self-perceptions, and encourage physical activity maintenance?
2. What FLOW intervention strategies and resources are the most effective for enhancing positive self-perceptions and facilitating physical activity maintenance among overweight and obese individuals?
3. Is it feasible to implement the FLOW intervention into the existing BELT program as currently designed?

The goal of the FLOW intervention program is to increase participant self-efficacy for exercise while providing the necessary psychological skills and preparation to maintain exercise over the long-term upon graduation from the BELT program. To date, few studies have combined both exercise and psychological skills intervention in promoting weight loss and lifestyle change within a bariatric population.

For the purposes of evaluation within the FLOW intervention, both outcome and process evidence were assessed. Outcome evidence is summative in nature, and includes objective measures that provide information regarding the changes in self-perceptions of participants and the effectiveness of the program as a whole (Rossi, Lipsey, & Freeman, 2004). For the purposes of the present study, outcome evaluation evidence was found within participants' self-reported progress with setting and achieving goals throughout the course of the program, the use of self-report questionnaires tracking changes in self-efficacy and social physique anxiety, and short assessments of participants' perceptions of the effectiveness of the FLOW intervention sessions. Process evidence may be considered formative, as these types of evidence are collected throughout the duration of the program (Rossi et al., 2004). Examples of process evidence include continued adherence to an exercise program after BELT graduation and the completion of an exit interview for participants in which they are given the opportunity to report their thoughts and feelings about the program, potential barriers possibly hindering further exercise, and their intentions to continue being physically active.

## **Setting**

### **The BELT Program**

The BELT program was established in 2010 as a collaborative relationship between the University of North Carolina at Greensboro's Department of Kinesiology and Moses Cone Health System's Bariatric Surgery Program. BELT is designed to help individuals in a bariatric population to adopt a physically active lifestyle. This program has been successfully operating for over six years with high levels of exercise adherence and positive participant feedback. The specific goals of the BELT program include assisting patients in learning how to exercise safely and effectively, to create positive exercise experiences in efforts to increase patients' confidence in being physically active, and to emphasize the importance of living a healthy lifestyle with the goal of promoting exercise adherence over the long-term. Over the course of the 16-week program, participants attend one-hour exercise sessions three days per week in efforts to improve cardiovascular fitness, muscular strength and endurance, flexibility, and agility. Sessions are run by trained graduate students and are supervised by a professor in the department of Kinesiology at UNCG who is a registered clinical exercise physiologist. Educational sessions have been offered on injury prevention, nutrition for exercise and weight loss, and goal setting techniques. Prior to the spring of 2016, no intervention aimed specifically at behavioral change using psychological skills or assisting participants with the transition to lifestyle physical activity was in existence. Thus, the FLOW intervention program was created and has been integrated into the BELT program moving forward.

## **The FLOW Intervention Program**

The FLOW intervention program was created and pilot tested in the spring of 2016 and serves as the behavioral change component of the BELT exercise program. Participant feedback indicated that extending the intervention to span the entire 16-weeks of the program would be beneficial, along with placing a greater emphasis on building self-confidence and preparing for the transition to lifestyle physical activity upon program graduation. This SCT-based intervention (Bandura, 2004) is aimed at increasing participant self-efficacy and educating participants about the benefits of adopting a physically active and healthy lifestyle over the long-term. The FLOW program focuses on fostering psychological skills important for behavior change such as goal setting, stress management, self-confidence, overcoming exercise barriers, and promoting positive body image perceptions. Each of the 16-weeks within the FLOW program focuses on building a certain skill with a particular emphasis on the transition out of the BELT program to maintaining an active lifestyle during the last eight weeks of the intervention. Throughout the first eight weeks of the program, the FLOW intervention focuses on psychological skill building with topics including goal setting, self-confidence, positive body image perceptions, and developing coping strategies to overcome barriers. The second eight weeks of the program focus on the transition to physical activity maintenance prior to BELT program completion, with an emphasis on developing a physical activity plan, identifying potential barriers to continued activity, stress management, and commitment to exercise. An outline of the FLOW intervention

including specific topics, a timeline for implementation, handouts for participants, and email follow-up protocol may be found in Appendix C.

### **Participants**

Approval from the University Institutional Review Board (IRB) was obtained prior to participant recruitment. For this study, participants were recruited from individuals who are participating in the BELT exercise program who are also involved in the FLOW psychological skills intervention. All participants involved in the study have undergone bariatric surgery. Based on previous BELT program enrollment during this time period, the number of participants to partake this study was 11 individuals, including ten females and one male ranging from 29 to 55 years in age. Participation was voluntary, and informed consent was collected prior to data collection. It is recommended that a sense of rapport and neutrality be established between participants and researchers in efforts to encourage involvement in the study. Individuals who feel comfortable in the setting and see the researchers as genuine, empathic, welcoming human beings will feel more inclined to partake in the study (Patton, 2002).

It should be noted that at times participants experience breaks within their 16-week program duration due to injury, illness, or other extenuating circumstances. In these cases, the schedule of intervention was adjusted to account for the time of absence. Those participants who missed attendance for less than the duration of a week continued their intervention on the normal 16-week schedule. This has been accounted for in the intervention plan with the use of informal participant check-ins. If a participant was absent for a particular intervention session, a check-in was skipped to account for all



educational sessions. Participants were informed they may leave the study at any time without penalty. All participants have self-selected to be a part of the program, with the goal of improving their exercise participation and adherence over the course of the 16-week program duration with hopes of successfully transitioning into a physically active lifestyle.

### **Researcher Perspective and Bias**

As a researcher, it is vital for me to be self-aware of my personal connections, knowledge, and potential biases, which influence my perspective. My interest in this subject matter is deep rooted in both my career and personal interests. Studying the behavior and motivations of others has always been of interest to me. My choice to pursue an undergraduate degree in psychology did not lead me directly to a career, but rather instilled in me a passion and love of learning that I must continue to fulfill. While searching for different career opportunities within the psychological realm, I came across sport and exercise psychology and was instantly intrigued. Going through a weight loss and lifestyle change journey myself, I can relate on a smaller scale to what these participants in the FLOW program are experiencing. I completed my Masters thesis on the impact of social physique anxiety and self-efficacy among college students in exercise settings, and have continued to explore this relationship at the doctoral level with post-bariatric surgery patients. My decision to live a healthy and active lifestyle has impacted those around me, and I have been told numerous times that I am an inspiration for my friends, family, and colleagues to eat healthy and exercise. Establishing a line of research in an area where I can integrate my personal passions into a work devoted to

improving the lives of others energizes and excites me. Therefore, I have made the decision to focus on physical activity and healthy lifestyle promotion both as a part of my research core and working in applied settings. My experiences with making a lifestyle transition myself will help me to develop a deeper understanding of the self-perceptions of the FLOW participants as they undergo a similar process of lifestyle change. While I have not experienced weight loss surgery, the process of facilitating a lasting behavior change in my own will help me to express empathy and understanding to participants throughout this process. I think it is also important to note my particular strengths of attention to detail and organizational skills along with a deep sense of empathy for the participants I worked with. While I attempted to provide a similar program experience for each participant, there are some individuals I connected with more easily than others which may have impacted the overall program results. This may have biased my work within the FLOW intervention, as I was particularly invested in the program's success and wanted to make a conscious effort to ensure the program ran as smoothly and efficiently as possible.

### **Data Collection**

This study utilized a holistic case study approach to examine the feasibility of the FLOW intervention to increase participant self-efficacy, positive self-perceptions, and the transition to physical activity maintenance. Additionally, this study also aimed to explore the feasibility of implementing the FLOW intervention into the existing BELT program. Multiple avenues of data collection were implemented in efforts to provide a holistic perspective of all aspects of the FLOW program (Merriam, 2009). Semi-structured

interviews as the main method of data collection identified by Patton (2002) as essential for qualitative research. Self-report measures assessing level of physical activity (IPAQ), self-efficacy for exercise (SEE), and social physique anxiety (SPA) were also administered in efforts to describe the sample and provide comparative evidence for participant changes as a result of the FLOW intervention. A short assessment evaluating the interest, usefulness, and clarity of the intervention sessions was administered at multiple points throughout the 16-week duration. Observational notes were also kept by the FLOW program facilitator outlining program logistics and participant responses to sessions. The use of multiple perspectives of data collection including self-report questionnaires, participant evaluations, and interviews helped to establish trustworthiness and credibility of the data by confirming the findings of one method with another (Patton, 2002). The following paragraphs will explain the timeline for FLOW intervention data collection and each of these methods in detail.

### **Interviews**

Within qualitative research, the investigator serves as a primary source of data collection. All interviews were completed by a trained graduate student and assistant professor with interview experience external to the BELT program. Prior to the beginning of data collection, a bracketing interview was completed between the interviewers and primary investigator in efforts to identify potential biases of the interviewers regarding the experiences of overweight and obese individuals in exercise settings and in efforts to ensure interview questions are comprehensible. Semi-structured interviews were used in efforts to provide a narrative perspective of the self-perceptions and experiences of each

participant partaking in the FLOW intervention. An initial set of interview questions was used, based on the three identified research questions. These questions focused on the changes of self-perceptions of program participants over the course of the 16-week exercise program, participant perceptions of the effectiveness of FLOW intervention program, and evaluating the effectiveness of the intervention as a whole.

### **Measures**

Demographic information regarding participants' age, gender, ethnicity, and type of weight loss surgery, obesity related comorbidities, occupation, and educational status was collected as a part of entrance testing into the BELT program and was included in the present study to describe the sample. Self-report questionnaires (SEE and SPA) were administered via Qualtrics during weeks 1, 8, and 16 of the program. Evaluation assessments about the intervention elements were completed in person via Qualtrics after the completion of intervention sessions. Overall assessments of the FLOW intervention were completed at week 16. An assessment regarding the self-reported amount of physical activity participants completed was administered at weeks 1, 8, and 16 of the BELT program online via Qualtrics. Surveys were sent to participants via email to complete individually at their own pace. These surveys were completed individually in efforts to reduce the potential reliability threat of social desirability, and they were counterbalanced to reduce the potential for order effects.

**International Physical Activity Questionnaire.** The International Physical Activity Questionnaire (IPAQ) long-form (Booth, 2000) assessed five areas of physical activity completed within the last seven days. Participants reported the amount of time

spent completing moderate and vigorous physical activity in job related settings, transportation settings, amount of time spent caring for family or doing housework, amount of time spent partaking in recreational, sport, and leisure activities, and amount of time spent sitting. These results were summed to produce a score to classify individuals in physical activity levels of low, moderate, or high.

**Self-efficacy.** The Self-Efficacy for Exercise scale (SEE; Resnick & Jenkins, 2000) is a 9-item scale in which participants rated their feelings of competence and confidence relating to their ability to exercise for both internal and external factors. Internal factors included items concerning affective responses and external factors assess confidence in situations such as weather. Higher total scale scores indicated higher levels of SEE. This scale has produced an internal consistency reliability value of .92 (Resnick & Jenkins, 2000).

**Social Physique Anxiety.** The Social Physique Anxiety Scale (SPAS) was developed by Hart, Leary, and Rejeski (1989) and originally consisted of 12-items. More recently, Motl and Conroy (2000) altered the SPAS to contain seven items scored on a 5-point Likert-type scale with anchors including 1 (not at all) to 5 (extremely). Items included phrases such as, “When I look in the mirror I feel good about my physique/figure,” or “In the presence of others I feel apprehensive about my physique/figure” (Hart et al., 1989). Higher scores indicated a higher prevalence of social physique anxiety. The use of this 7-item scale in measuring SPA levels was validated for a middle-aged previously sedentary population (McAuley, Bane, Rudolph, & Lox, 1995). This study found single intraclass correlation values of .85 for men and .89

for women, as well as average intraclass correlation values of .92 and .94 respectively (Scott et al., 2004). Internal consistency values for this scale were calculated at .72 (Motl & Conroy, 2001).

**Intervention evaluation.** Participant evaluations of the intervention components were obtained in person at different points throughout the program. These evaluations were completed after each of the intervention sessions and asked participants to rate their level of interest, effectiveness, and ease of use for each intervention skill. Examples of process questions include, “On a scale of 1 (not at all) to 5 (very), how useful was the presentation on goal setting?”, “On a scale from 1 (not at all) to 5 (very) how clearly was the information presented?”, “On a scale from 1 (not at all) to 5 (very) how often do you plan to use the information to reduce your levels of anxiety?” A list of questions may be found in Appendix A.

**Observational notes.** A journal of observational notes was kept by the FLOW facilitator throughout the course of the intervention data collection period. These notes identified areas for program improvement on program logistics, individual sessions, and from participant feedback. Additionally, observations were made regarding interactions between participants and the FLOW facilitator, noted sessions that were particularly successful and included informal verbal feedback from participants and BELT staff members. These observational notes aimed to provide information on the feasibility of implementing the FLOW intervention into the existing BELT program.

## Procedures

After receiving Institutional Review Board approval, data collection commenced. At the beginning of the 16-week program, each participant in the BELT program was given information about the study and be asked to voluntarily participate. Demographic information and initial administration of the IPAQ, SEE, and SPA questionnaires were completed at this time under the supervision of the primary investigator. IPAQ, SEE, and SPA questionnaires were administered again at weeks 8 and 16 of the program duration. Intervention evaluations were completed at weeks 2, 4, 5, 7, 9, 11, 12, and 16 of the program to assess each individual intervention session. All surveys were emailed to the participants by the primary investigator and were completed online via Qualtrics software and stored via password protection on the personal computer of the primary investigator. Each administration of these self-report measures lasted 15-20 minutes. A timeline for data collection is below in Table 1.

*Table 1. Data Collection Timeline*

| Event<br>Week                            | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| Collect Consent/<br>Demographics         | X |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
| Administer<br>IPAQ                       | X |   |   |   |   |   |   | X |   |    |    |    |    |    |    | X  |
| Administer SEE                           | X |   |   |   |   |   |   | X |   |    |    |    |    |    |    | X  |
| Administer SPA                           | X |   |   |   |   |   |   | X |   |    |    |    |    |    |    | X  |
| Administer<br>Intervention<br>Evaluation |   | X |   | X | X |   | X |   | X |    | X  | X  |    |    |    | X  |
| Observational<br>Notes                   | X | X | X | X | X | X | X | X | X | X  | X  | X  | X  | X  | X  | X  |
| Interview                                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | X  |

Semi-structured interviews took place upon completion of 16-week program lasting 30-45 minutes, and were conducted by two trained researchers external to the BELT and FLOW programs. Interview questions were based upon the three research questions established by the primary investigator changes of self-perceptions of bariatric surgery patients over the course of the 16-week exercise program, participant perceptions of the effectiveness of FLOW intervention program, and evaluating the effectiveness of the intervention. Special attention was given to the ordering of the interview questions in efforts to gain insight into the entire experience of the participant. Based on qualitative interview structuring outlined by Patton (2002), the interviews started with broad questions asking participants about their experience in the BELT program, then moved to deeper questions about the FLOW program's effectiveness and potential changes the participants have seen within themselves over the course of the program. Interviews concluded with final thoughts about the program and inquired about means of program improvement. Probing questions were used to elicit further explanation or understanding of participant responses. The interview guide may be found in Appendix B.

All interviews were audio recorded by the interviewers and files were stored on the laptop computer of the primary investigator in a password protected folder. Participants were informed that all information collected as a part of the study was confidential and that demographic information would remain coded as to eliminate any potential identification of participants. Furthermore, participants were informed they may choose to leave the study at any time without penalty. Following the semi-structured interviews, the audio recordings were fully transcribed verbatim by the primary



investigator. Upon completion of transcription, the interview transcripts were sent to participants and the interviewers for review. After this review was completed the primary investigator conducted analysis of the data.

### **FLOW Intervention Timeline**

The FLOW intervention followed the same 16-week structure as the BELT program. It should be noted that at times participants experience breaks within their 16-week program duration due to injury, illness, or other extenuating circumstances. In these cases, the schedule of intervention was adjusted to account for the time of absence. Those participants who missed attendance for less than the duration of a week continued their intervention on the normal 16-week schedule. Four weeks of the intervention program were labeled as check-in points for participants. In the event of excess absences, a check-in was replaced with an intervention session in efforts to ensure all education material was delivered throughout the intervention.

During week one of the intervention, an overview of the program took place which outlined the topics covered and explained the overall structure of the program and agenda for intervention sessions. Participants were introduced to the structure of the program and provided email contact information for sending handouts and evaluation assessments. Prior to the start of the session, the information was sent to the participant for review via email to minimize the amount of time taken away from the exercise portion of the session. This allowed participants to review the information and come prepared with any questions prior to the educational session. Educational sessions lasted approximately 15 minutes with the exception of goal setting which lasted 30 minutes.

These interventions included discussion of the information sent to participants prior to the session via email and the completion of a worksheet or other interactive activity.

Informal check-ins at weeks 3, 6, 10, and 13 served as follow-ups to previous intervention sessions and allowed participants the opportunity to ask questions or discuss potential successes and areas for improvement. Within the in-person intervention session, the FLOW facilitator (primary investigator) delivered the educational information and assisted participants in completing a worksheet correlating to the topic. Upon completion of the intervention sessions, the facilitator asked participants to complete an online intervention evaluation tailored to each individual session as described below. This occurred in week 2 (goal setting), week 4 (self-confidence), week 5 (body image perceptions), week 7 (barriers and coping skills), week 9 (goal setting and exit strategies), week 11 (stress management), and week 12 (behavioral commitment). Intervention evaluations also took place at the conclusion of the program at week 16 in efforts to assess the intervention as a whole.

### **Data Analysis**

In this holistic case study approach, data analysis included making sense of the data by comparing multiple sources of evidence. Interpretations were made by consolidating and reducing data to make meaning based on the observations of the researcher, feedback from participants (i.e. self-report measures and intervention evaluations), and semi-structured interviews (Merriam, 1998). Data analysis for this study took place in stages, and occurred simultaneously with data collection. All data analysis was conducted by the primary researcher. Intervention evaluations were

reviewed in a timely manner in efforts to cater to the needs of participants as they progress through the FLOW intervention. Observational notes were recorded consistently throughout the course of the data collection period. Interviews were transcribed as soon as they were completed so transcripts could be sent back to participants for member checking. Self-report questionnaires (IPAQ, SEE, and SPA) were analyzed at the end of the 16-week data collection period. Each of these analyses is described in detail below.

Completed surveys were coded with a number in efforts to retain confidentiality of participants. Upon the completion of survey administration, responses were summed using SPSS v.23 (Armonk, NY: IBM Corp). Descriptive characteristics were cited to report the means and standard deviations for each of the measures. This analysis was completed using SPSS v. 23 (Armonk, NY: IBM Corp). All questionnaires (SEE, SPA, IPAQ) were used to describe the sample and check for changes throughout the course of the intervention. The intervention evaluations were assessed to determine which topics were the most useful for participants and serve as information for further program development and improvement.

Interviews were conducted by a trained graduate student and assistant professor with qualitative research experience who also assisted with data analyses. Upon completion, interviews were recorded and fully transcribed verbatim. Pseudonyms were used in efforts to retain confidentiality of the participants. The use of multiple angles for data analysis helped to establish trustworthiness of the results (Patton, 2002). Raw data was then coded be into main themes from the interview transcripts. This coding process, conducted by the primary investigator, followed the procedure established specifically for

qualitative research by Brinkmann and Kvale (2015) for open and axial coding. After transcripts were read and reread, an initial set of open codes was developed by labeling words and/or phrases in the transcripts in a part-whole format. This included a line-by-line analysis of each transcript to determine those key words and phrases in each part of the interview. These codes represent categories that emerged from observations and experiences in the setting. Similar codes were combined to form categories which described the data in groups based on key words and phrases. Once these categories began to emerge, the researchers went back through the transcripts and recoded the data using the common categories and developing subcategories if necessary. From there, the researchers progressed into the axial coding process by connecting categories and subcategories through developing themes in efforts to establish meaning and understanding of the data. A final list of categories was determined which provided a summation of similar responses among all participant interviews.

Observational notes taken by the FLOW intervention administrator (primary investigator) throughout the intervention period were used to supplement interview findings and provide observational evidence of the effectiveness of individual interventions and the overall program. These findings were used to improve the integration of the FLOW intervention into the existing BELT program and provide additional feedback for program improvement. Following the procedures for case study analysis outlined by Merriam (2009), all sources of data were then combined to provide a comprehensive and holistic understanding of the FLOW intervention as currently designed in the existing BELT program.

## CHAPTER IV

### RESULTS

The purpose of this study was to examine the feasibility of the FLOW intervention program to promote positive participant self-perceptions, increase self-efficacy, and encourage physical activity maintenance among program participants, as well as to assess the practicality of integrating the FLOW intervention as a part of the existing BELT program. This chapter reports basic demographics of the sample, identifies themes determined by interviews, and provides a summary of the overall effectiveness of implementing the FLOW program as a part of the current BELT program.

#### **Demographic Data**

Eleven individuals completed the 16-week FLOW intervention program. This included ten female participants and one male participant. Participants ranged in age from 29 to 55 years old with a mean of 45.1 years ( $SD=9.6$ ). This sample was comprised of 73% ( $n=8$ ) Caucasian and 27% ( $n=3$ ) African-American individuals. Education levels included trade or technical school (27%,  $n=3$ ), Associates degree (9%,  $n=1$ ), Bachelor's degree (9%,  $n=1$ ), Master's degree (36%,  $n=4$ ), and Professional degree (18%,  $n=2$ ). A wide range of occupations were included. Common obesity related comorbidities were found to be arthritis (18%,  $n=2$ ), sleep apnea (27%,  $n=3$ ), high blood pressure (27%,  $n=3$ ), type-II diabetes mellitus (9%,  $n=1$ ), fatty liver syndrome (18%,  $n=2$ ), gall bladder

disease (9%,  $n=1$ ), depression (9%,  $n=1$ ), and psychological stress (9%,  $n=1$ ).

Additionally, 55% of participants ( $n=6$ ) reported no signs of obesity related comorbidities. Participants had undergone three different types of bariatric surgery prior to beginning the program including Roux-en-Y Gastric bypass (18%,  $n=2$ ), Laparoscopic Adjustable Gastric Banding (18%,  $n=2$ ), or Vertical Sleeve Gastrectomy (64%,  $n=7$ ). A summary of participant demographics is presented in Table 2 below.

*Table 2. Sample Demographics*

|   | <b>n = 11</b>     |
|---|-------------------|
| Age in years                            | 45.1 ( $\pm$ 9.6) |
| Ethnicity                               |                   |
| White                                   | 8 (73%)           |
| African-American                        | 3 (27%)           |
| Education                               |                   |
| Trade/Technical School                  | 3 (27%)           |
| Associates Degree                       | 1 (9%)            |
| Bachelor's Degree                       | 1 (9%)            |
| Master's Degree                         | 4 (36%)           |
| Professional Degree                     | 2 (18%)           |
| Obesity Related Comorbidities           |                   |
| Arthritis                               | 2 (18%)           |
| Sleep apnea                             | 3 (27%)           |
| High blood pressure                     | 3 (27%)           |
| Type-II diabetes                        | 1 (9%)            |
| Fatty liver syndrome                    | 2 (18%)           |
| Gall bladder disease                    | 1 (9%)            |
| Depression                              | 1 (9%)            |
| Psychological distress                  | 1 (9%)            |
| No reported conditions                  | 6 (55%)           |
| Bariatric Surgery Type                  |                   |
| Roux-n-Y Gastric Bypass                 | 2 (18%)           |
| Laparoscopic Adjustable Gastric Banding | 2 (18%)           |
| Vertical Sleeve Gastrectomy             | 7 (64%)           |

## Objective Measures

Additional measures used to describe the sample were self-report questionnaires administered at weeks 1, 8, and 16. These questionnaires included the International Physical Activity Questionnaire (IPAQ) long-form (Booth, 2000), the Self-Efficacy for Exercise scale (SEE; Resnick & Jenkins, 2000), and the Social Physique Anxiety Scale (SPAS) developed by Hart, Leary, and Rejeski (1989).

**Self-report questionnaires.** IPAQ results indicated that at week 1, four participants were classified as moderately active while seven participants reported low levels of physical activity. Moderate activity classification was determined by five or more days of moderate-intensity activity or walking at least 30 minutes or three or more days of vigorous activity for at least 20 minutes per day. Leisure time physical activity took place in the form of walking. Participants walked an average of 4.4 days ( $SD=2.4$ ) per week for 33.6 minutes per day ( $SD=18.5$ ) in week 1. During week 8, participants averaged walking 2.2 days ( $SD=1.5$ ) per week for 31.4 minutes ( $SD=26.1$ ) per day. Finally, at week 16 participants walked an average of 3 days ( $SD=1.8$ ) per week for 52.5 minutes ( $SD=31.0$ ) per day. The average amount of time spent sitting was 6.6 hours ( $SD=3.2$ ) on weekdays and 4.8 hours ( $SD=2.9$ ) on weekends. At week 8, five participants were classified as moderately active while six participants were classified with a low level of physical activity. Time spent sitting decreased to 5.7 hours on weekdays ( $SD=3.4$ ), but increased to 5.9 hours on weekends ( $SD=3.6$ ). In week 16, time spent sitting decreased to 5.6 hours on weekdays ( $SD=3.4$ ), and 4.3 hours on weekends ( $SD=2.9$ ). At week 1, participants reported a mean SEE score of 40.3 ( $SD=18.6$ ). At

week 8, this score had increased to a mean of 52.5 ( $SD=15.0$ ). Finally, at week 16 SEE scores declined slightly to show a mean of 48.8 ( $SD=21.6$ ). Additionally, SPAS-7 scores were reported with a mean of 20.2 ( $SD=6.5$ ) at week 1, but decreased at week 8 to a mean of 17.7 ( $SD=6.4$ ). At week 16, SPAS-7 scores were identified with a mean of 19.7 ( $SD=5.6$ ). Table 3 outlining the means and standard deviations for these measures is found below.

*Table 3. Descriptive Statistics of Self-Report Questionnaires*

|                               | <b>Week 1</b> | <b>Week 8</b> | <b>Week 16</b> |
|-------------------------------|---------------|---------------|----------------|
| <b><i>IPAQ</i></b>            |               |               |                |
| <b><i>Leisure Time PA</i></b> |               |               |                |
| <i>Walking days</i>           | 4.4 ± 2.4     | 2.2 ± 1.5     | 3 ± 1.8        |
| <i>Walking min./day</i>       | 33.6 ± 18.5   | 31.4 ± 26.1   | 52.5 ± 31.0    |
| <b><i>Sitting time</i></b>    |               |               |                |
| <i>Weekday hours</i>          | 6.6 ± 3.2     | 5.7 ± 3.4     | 5.6 ± 3.4      |
| <i>Weekend hours</i>          | 4.8 ± 2.9     | 5.9 ± 3.6     | 4.3 ± 2.9      |
| <b><i>Activity Level</i></b>  |               |               |                |
| <i>Low</i>                    | 7             | 5             | 4              |
| <i>Moderate</i>               | 4             | 6             | 6              |
| <i>High</i>                   |               |               | 1              |
| <b><i>SEE Total</i></b>       | 40.3 ± 18.6   | 52.5 ± 15.0   | 48.8 ± 21.6    |
| <b><i>SPAS-7 Total</i></b>    | 20.2 ± 6.5    | 17.7 ± 6.4    | 19.7 ± 5.6     |

Note: IPAQ = International Physical Activity Questionnaire, SEE = Self-Efficacy for Exercise Scale, SPAS-7 = Social Physique Anxiety Scale, PA = Physical Activity

### **Session Data**

In addition to self-report questionnaires describing program participants, additional information was collected regarding the feasibility of implementing intervention program. Throughout the course of the intervention, a series of evaluations were completed by program participants following each psychological skills session.



Intervention evaluations assessed the usefulness of each session, the clarity with which each session was presented, and the likelihood of participants to use this information in the future. These evaluations also included an open-ended question asking participants to indicate what they felt was particularly good about the session or what could be improved. A final intervention evaluation was completed at the end of the 16-week intervention assessing which sessions were the most beneficial to participants, the overall usefulness of the intervention, and means for improvement. Additionally, observational notes were taken by the FLOW program facilitator regarding identification of areas for program improvement on program logistics, individual sessions, and from participant feedback.

### **Retention**

A total of 18 participants tested into the BELT program during the data collection period. Of these 18 participants, 11 (61%) completed the entire FLOW intervention. Seven participants (39%) dropped out of the BELT program prior to completing the intervention. Of these seven participants, three dropped out prior to the first intervention session, two dropped out at week three, and two dropped out at week five. Reasons for cessation of program involvement included changes in work schedule (2 participants), family emergencies (1 participant), or prolonged illness or injury (1 participant). Three participants noted no reason for program cessation. A table outlining the baseline characteristics of all participants is found in Appendix E.

## **Intervention Evaluations**

Upon completion of each intervention session, evaluations were completed assessing participant perceptions of the psychological skill intervention. Each survey followed the same format. On a scale from 1(not at all) to 5 (very), participants rated the usefulness of the session, how clearly the information was presented, and how likely they were to use the information in the future. An open-ended question was also included asking for participant feedback about positive aspects of the session or means for improvement. The ratings of usefulness for each individuals session included stress management ( $M=4.8, SD=0.6$ ), exit strategies ( $M=4.7, SD=0.5$ ), behavioral commitment ( $M=4.6, SD=0.7$ ), body image perceptions ( $M=4.5, SD=0.9$ ), barriers and coping skills ( $M=4.4, SD=0.7$ ), self-confidence ( $M=4.3, SD=0.8$ ), and goal setting ( $M=4.2, SD=0.6$ ). Clarity of presentation produced means and standard deviations for each session including stress management ( $M=4.9, SD=0.3$ ), exit strategies ( $M=4.8, SD=0.4$ ), behavioral commitment ( $M=4.7, SD=0.7$ ), goal setting ( $M=4.7, SD=0.5$ ), body image perceptions ( $M=4.6, SD=0.7$ ), barriers and coping skills ( $M=4.5, SD=0.9$ ), and self-confidence ( $M=4.5, SD=0.8$ ). Finally, participants rated the sessions they would be most likely to use. These included means and standard deviations as follows: stress management as ( $M=4.8, SD=0.6$ ), exit strategies ( $M=4.7, SD=0.5$ ), behavioral commitment ( $M=4.6, SD=0.6$ ), body image perceptions ( $M=4.6, SD=0.7$ ), barriers and coping skills ( $M=4.6, SD=0.7$ ), self-confidence ( $M=4.5, SD=0.8$ ), and goal setting ( $M=4.2, SD=0.8$ ). Overall, the differences of means and standard deviations of these sessions ratings were marginal, as the range of scores included means of 4.2 to 4.9 out of

a total possible ranking of 5. Participants perceived the sessions to be useful, clearly presented, and information they would likely use in the future.

Participants also completed open-ended responses at the end of each intervention evaluation. The short answer open-ended responses indicated positive feedback such as helpfulness of information, importance of accountability, encouragement of positive self-perceptions, and overall session enjoyment. Suggestions for improvement from these evaluations indicated some participants would prefer having sit down sessions instead of conversing while exercising and establishing program goals for participants as opposed to individual goal setting. A summary of participant responses is located in Appendix F.

*Table 4. Descriptive Statistics of Individual Intervention Evaluations After Each Session*

| <b>Topic</b>                      | <b>Usefulness</b> | <b>Clarity</b> | <b>Future Use</b> |
|-----------------------------------|-------------------|----------------|-------------------|
| <i>Goal Setting</i>               | 4.2 ± 0.6         | 4.7 ± 0.5      | 4.2 ± 0.8         |
| <i>Self-Confidence</i>            | 4.3 ± 0.8         | 4.5 ± 0.8      | 4.5 ± 0.8         |
| <i>Body Image Perceptions</i>     | 4.5 ± 0.9         | 4.6 ± 0.7      | 4.6 ± 0.7         |
| <i>Barriers and Coping Skills</i> | 4.4 ± 0.7         | 4.5 ± 0.9      | 4.5 ± 0.7         |
| <i>Exit Strategies</i>            | 4.7 ± 0.5         | 4.8 ± 0.4      | 4.7 ± 0.5         |
| <i>Stress Management</i>          | 4.8 ± 0.6         | 4.9 ± 0.3      | 4.8 ± 0.6         |
| <i>Behavioral Commitment</i>      | 4.6 ± 0.7         | 4.7 ± 0.7      | 4.6 ± 0.6         |

Additionally, an intervention evaluation of the entire FLOW program was completed at week 16. Participants rated the usefulness of each session, ranked the top three sessions they felt were the most useful, and rated the usefulness, clarity of

presentation, and their likelihood of using the information from the overall FLOW program. Open-ended comments regarding positive aspects of the program and means for improvement were also collected. Results indicated the usefulness of each session including self-confidence ( $M=4.6$ ,  $SD=0.7$ ) and barriers and coping skills ( $M=4.6$ ,  $SD=0.7$ ). This was followed by goal setting ( $M=4.5$ ,  $SD=0.7$ ), body image perceptions ( $M=4.4$ ,  $SD=0.7$ ), stress management ( $M=4.4$ ,  $SD=0.7$ ), exit strategies ( $M=4.3$ ,  $SD=0.7$ ), and behavioral commitment ( $M=4.3$ ,  $SD=0.7$ ). Again, a small range of mean scores from 4.3 to 4.6 out of a possible total of 5 indicated small differences in participant ratings of the usefulness of each session. A summary of these scores is found in Table 5.

*Table 5. Descriptive Statistics of Overall FLOW Program (Week 16)*

| <b>Topic</b>                      | <b>Usefulness</b> |
|-----------------------------------|-------------------|
| <i>Goal Setting</i>               | 4.5 ± 0.7         |
| <i>Self-Confidence</i>            | 4.6 ± 0.5         |
| <i>Body Image Perceptions</i>     | 4.4 ± 0.7         |
| <i>Barriers and Coping Skills</i> | 4.6 ± 0.7         |
| <i>Exit Strategies</i>            | 4.3 ± 0.7         |
| <i>Stress Management</i>          | 4.4 ± 0.7         |
| <i>Behavioral Commitment</i>      | 4.3 ± 0.7         |

The top three most useful sessions were identified by participants to be goal setting (stated by 7 participants), stress management (stated by 5 participants), and self-confidence (stated by 5 participants). The remaining sessions were rated in order as body

image perceptions (stated by 3 participants), barriers and coping skills (stated by 3 participants), exit strategies (stated by 1 participant), and behavioral commitment (stated by 2 participant). The overall FLOW program was also evaluated positively and participants indicated ratings for usefulness ( $M=4.3$ ,  $SD=0.9$ ), clarity of presentation ( $M=4.7$ ,  $SD=0.7$ ), and likelihood of future use ( $M=4.7$ ,  $SD=0.5$ ). Suggestions for improvement included adding the option to have intervention sessions while not working out to avoid the inability to concentrate on both activities simultaneously.

### **Researcher Themes**

Throughout the course of the data collection period, the researcher kept observational notes regarding areas for program improvement regarding logistics and implementation, positive and negative characteristics of individual sessions, and informal feedback from program participants. The researcher's notes tended to center around criticism of program elements, challenges encountered, and areas for program improvement and future development. Feedback from participants most often included increased positive self-awareness, identification of perceived program benefits, and gratitude to the researcher for her work. Upon reviewing these notes, the primary investigator coded the data by grouping together similar responses, observations, and participant feedback to produce an initial set of similar words and phrases that were then grouped together into overarching themes. The themes identified resulting from these observations include the need for organization and planning in efforts to execute the FLOW intervention efficiently and consistently for all participants, positive feedback from participants regarding their experiences in the FLOW program, and improvements.

**Organization and planning.** This theme encompasses the need for organization and planning regarding the logistics of the intervention. Due to the rolling enrollment of the BELT program, each participant was at a different stage in the intervention process at any given time. This made tracking intervention progress and session implementation difficult on the researcher, due to the need to schedule multiple intervention sessions on any given day. Another obstacle would occur when a participant would be absent on a day an intervention was scheduled and the session would need to be made up at another time to stay on track. Informal check-ins were skipped because of this, however there were some instances when participants would miss multiple days in a row and the researcher would have to shift around other participant sessions at the last minute to accommodate for absences. This may have affected the quality of the intervention sessions, as a lack of consistency and preparedness of the researcher may have resulted in a lower quality of intervention implementation. A spreadsheet was used to track the progress of each participant, and email reminders were consistently sent prior to intervention sessions and for collecting intervention evaluation data. For some participants, it took multiple email messages to prompt them to complete the evaluations which was time consuming and frustrating on the part of the researcher. In the end, all participants were able to complete each intervention session and all evaluations part of the FLOW program assessment.

**Positive participant feedback.** Participants reported overall positive experiences for the opportunity to participate in the FLOW program. Consistent positive verbal and written feedback were given to the researcher during and after intervention sessions both

face-to-face and via email, including expression of gratitude for the session and how they felt the intervention was helpful for learning more about their self-perceptions and increasing confidence. Examples of feedback included, “I really appreciate what you are doing for me,” or “Thank you for investing your time in me during this process.” Many participants expressed they felt that this program was such a good experience that they did not want to leave. A few provided suggestions for program improvement as well.

**Program improvement.** This final theme includes areas for program improvement from multiple perspectives. Overall, the FLOW program was received well by participants and BELT program staff. A few suggestions for improvement were given regarding the format in which the sessions were completed. One participant mentioned she would like to have the sessions face-to-face as a seated conversation instead of while exercising. Additionally, the researcher noticed repetition of content throughout some of the intervention sessions over time. A potential solution for this is to combine a few of the sessions together, such as self-confidence with positive body image perceptions and barriers and coping skills with stress management. This would avoid repetition of information and ease the demands of coordinating numerous sessions on the individual implementing the intervention. A final note for improvement is to establish a team of interventionists rather than one sole intervention implementer. This would aid in the organization and time management for the lead interventionist and improve overall quality of the sessions by allowing an increased amount of time to be spent with each participant.

## **Interview Data**

The qualitative interviews conducted upon FLOW program completion at week 16 were fully transcribed and coded into themes using the process for open and axial coding (Brinkmann & Kvale, 2015). In an effort to present a concise and comprehensive description of the data, specific and detailed quotations were used. As a result of reading and coding the data, seven categories emerged. Subcategories were also determined when necessary. These divisions include positive overall BELT program experiences, positive FLOW program experiences, accountability and social support, positive facilitator interactions, most impressionable psychological skills sessions, positive impact on self-perceptions, and program improvement. Each of these categories will be explained in depth with anecdotal evidence from participants in the paragraphs that follow.

### **Positive BELT Program Experiences**

Overall, all program participants reacted positively to their experiences in the BELT program. All 11 participants indicated they felt the program as helpful for learning to exercise properly, increasing motivation to exercise, and increasing self-confidence for exercising in a gym setting. Additional positive reactions included memorable interactions with the BELT program staff, especially regarding being able to learn how to push themselves physically and mentally during exercise bouts. Many participants mentioned how helpful the students were during the program, and their sense of comfort found in exercising with a group of individuals “like them” who have also experienced bariatric surgery. These individuals felt grateful for their experiences in BELT and



wished for others to have similar experiences after bariatric surgery. One participant stated she felt proud to have this experience:

I think the gym is wonderful. The students are wonderful. [The BELT Program Director] is great. I just think overall experience is something that everybody should have. I know friends who have weight loss surgery in other areas, and the level of support after surgery is nothing like I've had. I really am proud.

No suggestions for program improvement were given regarding the overall BELT program. Participants noted that these positive experiences carried over from the overall BELT program to the specific FLOW intervention sessions as well.

### **Positive FLOW Program Experience**

In addition to the overall BELT program, all participants reacted favorably toward the entire FLOW intervention program as well. Participants felt the FLOW program helped them realize their strengths and weaknesses and helped motivate them to exercise both on days they had the BELT program and other days throughout the week. One participant noted how much progress she saw in herself from beginning to end with the help of the FLOW program facilitator:

Well, she had been sending updates all along. She had been sending updates all along, and I was following along, but then at the end when we did our exit meeting or whatever and she presented all that stuff to me, I hadn't realized how much work I had actually done until I had seen it. I appreciated that.

The amount of information provided as a part of the FLOW program was also noted as a strength. Participants felt that they were always updated and informed about upcoming sessions, progress they were making along the way, and felt supported an

encouraged throughout the duration of the intervention. Many participants indicated they were glad for the chance to participate and the interactions they had with the FLOW program facilitator. A sense of accountability and social support was one of the main positive attributes of this interaction.

### **Accountability and Social Support**

The category of accountability and social support was one cited by multiple participants. For many participants, being a part of a group and feeling a sense of belonging was one of the most important parts of the program. One participant noted, “The group experience was the most important. It was helpful to have a plan and people to support it.” Multiple other participants indicated the value of having a group experience and felt that it added value to the program. Another participant mentioned feeling a sense of belonging by indicating an advantage of the FLOW intervention is:

Well I mean you know you get to have this nice little group, everybody knows everybody. Most people have all experienced the same thing. They have either done the surgery or they're anticipating the surgery or something like that. You get to know each other and you start hearing their stories.

Support of the group members was a key element to successful intervention completion. One participant noted, “It is great to have people to help you, and to guide you, and to make you come on a day when you really don't feel like it.” Many participants also mentioned that the support and encouragement they received from others allowed them to feel accountable for exercising on days the program was held. Additionally, support from the FLOW facilitator was important for many participants. It was mentioned “encouragement from the FLOW facilitator” helped them feel they were

progressing in the program which helped them feel more confident in their ability to continue exercising and achieve their goals:

I think having somebody available to me to be that person that I was accountable to was very helpful. Because like I said, I can make a goal. I can write a goal, but telling it to someone and actually doing it was I think the necessary piece for me.

This sense of accountability and social support extended from both group members and program staff to the FLOW facilitator. Some of the most notable program interactions occurred between participants and the FLOW facilitator over the course of the intervention. Many participants noted the positive qualities and characteristics of the facilitator herself.

### **Positive Facilitator Interactions**

During the 16-week FLOW intervention, each participant had an extended period of interaction with the FLOW facilitator. This led to the development of a sense of trust and rapport between participants and the FLOW facilitator. Participants felt comfortable opening up to the facilitator and mentioned, “she knows how to motivate you and give you pointers on what you should do if you’re starting to overthink or have second thoughts...she’s very good at that.” Another participant noted the amount of encouragement she received from the FLOW facilitator: “She’s always complimenting us as we’re going along, taking about how strong we’ve gotten with the workout sessions and everything.” They felt encouraged and were able to understand the intervention material through thorough and clear explanation of each psychological skill. It was also mentioned that not only did participants feel comfortable learning skills and setting goals,

but they also felt the FLOW facilitator “encouraged us to try and look at ourselves better,” or “she saw barriers that perhaps I didn’t see. I learned a lot from her.” One participant particularly noted her love of the individualization aspect of the FLOW program and attention she received from the FLOW facilitator:

Well, I think that [the FLOW facilitator] probably needs to be cloned. Yeah I think that would be the first place to start. She was spending time with me. I couldn't imagine how she was also following up with everybody else. You know what I'm saying? There was sometimes we had a whole conversation for the whole time I was doing cardio for a half hour. I was like are these other people getting this too or is this just something that is special to me? The fact that she was able to keep it all together and for everybody. She knew where everybody was at. She obviously must have some sort of spreadsheet and be very well organized, but she really needs to be cloned I think.

The organization and preparedness of the FLOW facilitator was evident participants throughout the intervention and their interactions with her. In addition to positive interactions with the FLOW facilitator, participants identified psychological skills sessions that they felt were the most helpful during the FLOW intervention.

### **Impressionable Psychological Skills Sessions**

The objective intervention evaluations indicated that participants generally ranked each of the psychological skills sessions highly regarding usefulness of the skill, clarity of the presentation, and likelihood of future skill use. Similar to the overall intervention evaluations, a few key psychological skills sessions were highlighted to be particularly useful. These sessions included goal setting, stress management, and exit strategies.

**Goal setting.** The first psychological skill session that emerged as particularly useful from the interview data surrounded the participants striving to set and achieve

goals while in the program. Many participants felt that setting goals gave them a “point of reference” for their progress throughout the 16-week program, and allowed them to “see improvements” along the way. One participant noted:

I thought the goal evaluating was great. It gave me something to work towards and [the FLOW facilitator] checked by the end to see how the goals were going, if I was able to achieve any of those.

Many goals mentioned by participants included wanting to lose weight, increase strength and endurance, or fit into a certain clothing size. Some of the goals mentioned by participants expanded further than the duration of the program as well. One participant noted she felt “determined to take control of her health and fitness,” while another mentioned, “I have been challenged by my brother to run a half-marathon in 10 months. I’m going to do it.” Another participant mentioned the importance of setting goals for establishing a sense of direction:

Because when you've been heavy all your life and you stay in that same pattern, same rut all the time, you kind of have to have a little bit of guidance somewhere along the way to help get you pointed in the right direction.

Setting goals helped participants feel a sense of achievement throughout the FLOW intervention, and helped increase their self-confidence. It gave them something to work towards, “to prove to myself and others.”

**Stress management.** In addition to goal setting, stress management was another session participants found particularly helpful. They felt identifying potential stressors and coping mechanisms was an important skill for not only their health behavior change

and weight loss journey, but also for their interactions with work, family, and friends.

While some participants mentioned they had used some stress management techniques previously, not all of these techniques were health minded. Multiple participants indicated they had previously gone to food in times of stress, which lead them to struggle with weight in the past. It was noted that the FLOW facilitator encouraged them to think about new techniques for managing stress such as staying present focused, deep breathing, and going for a walk when they felt stressed:

To me, that's really good because even though we can come up with the problems that we have or the struggles we have or whatever and she does give us suggestions as to ways to handle things. If you have a stressful moment, instead of sitting down and eating in front of the TV, get up and take a walk. Do something a little different. Get distracted by doing something else. Or if nothing else, do a workout program or something if you've got one at home that you'd do. All of the suggestions that she gives for that is really helpful. A lot of people think when they get in that stressful thing, they think about all they want to do is eat. Or when they're bored they want to eat. It's just better to, like she says, get up and go for a walk, do a little exercise, get up and do something. Go outside if you're inside. Something to change it up so you're not thinking about eating.

Using exercise as a form of stress relief was a new technique for many participants in the program. One participant noted this in response to using exercise to manage stress, “I have to look at it as an opportunity instead of something I have to do or am being made to do. It is a gift I am giving to myself.” While this was not something she had previously turned to in times of excessive stress, she mentioned how the FLOW program was helping her reframe her thought process to find healthier ways to manage stressful situations.

**Exit strategies.** The final session that participants noted to be especially helpful throughout the FLOW intervention concerned exit strategies. This session focused on identifying goals and plans for participants to continue exercising once they finished the BELT program. Potential barriers were discussed that may prohibit individuals from remaining active as well. Some of the barriers identified included laziness, poor diet, physical limitations, or returning to an inactive lifestyle. One participant noted she was afraid of regressing back to old habits upon leaving the program:

Beforehand it's like, okay well it's cold outside. I don't want to do that. I'd always have some excuse as to why not to work out. Now I know it's like in order for me to stay my path that I want to take to get to the end, I have to do that. If not, I'll go right back to the same pattern that I was in. Being sedentary.

While a few participants were concerned with returning to their old inactive lifestyles, most participants indicated they felt confident to continue exercising on their own and hopeful about future opportunities to remain active. Potential plans for continued activity after completing the program included transitioning into the HOPE program (a similar exercise program on UNCG's campus), working out at home using videos, walking outside, joining another fitness facility (i.e. Planet Fitness, the YMCA, a yoga studio, or an aquatic center), or finding a student sponsor to join the UNCG gym. One participant noted the benefits she has gained from being physically active outweigh the barriers of inactivity:

I feel like I could do really well because like I said I know how important it is to have the physical activity and it does make you feel better. If you feel better and not just tired all the time, I mean yeah I can still come home every night now and sit down after I eat dinner and I'll be trying to watch a TV show and I'm asleep

before the show's ever over with because that's just the way I feel. But I am, like I said, I am stronger. It makes me feel better to do it.

These positive experiences with physical activity encouraged participants to reevaluate how they view themselves both physically and psychologically. It was mentioned that the FLOW program had a positive impact on participant self-perceptions through increased confidence and encouraged self-reflection.

### **Positive Impact on Self-Perceptions**

Many participants noted that the FLOW intervention program was beneficial for helping them enhance positive self-perceptions. It was noted that participants found it beneficial to take time to look at themselves from a different perspective than they had previously considered. One participant noted, “I didn't realize that I had some of the opinions that I had about myself until I was asked to repeat them.” This sentiment was echoed by other participants as well. It was mentioned that these individuals would often receive feedback from those around them concerning their weight loss or changes in physical appearance, but was difficult for them to internalize due to a lack of positive self-perception. The FLOW program helped to facilitate this change:

[The FLOW facilitator] encouraged us to think about our confidence not with how our bodies look but what they can do for us every day. Things we are capable of. She really made me see some other points, and things to be proud of about our bodies, not just what it looks like. What it does for us every day. I still carry this self-confidence reminder around with me every day.

Other participants noted this information was “eye opening” and they were grateful for the opportunity to see themselves differently than they had before. All



participants noted their gratefulness for the opportunity to participate in the FLOW program and for the time the facilitator invested in helping participants learn more about themselves. Notable self-discoveries included newfound strength to move forward and increased confidence from setting and achieving goals.

Self-confidence ... It was awesome. I think that as far as my dealing with self-image and things like that, I can really say it really helped. I've always been an outgoing person. When it comes down to your health and your weight, that hits you at your heart. It really helped motivate me as talking about being more confident. Being kind to yourself. You got to be kind to yourself and be thankful for the little goals that you have met. As far as being self- confident, that really, really boosted me a lot. Things that I'm doing now... Don't know if I would do that a year or so ago.

Participants found it helpful to continue to focus on positive aspects as opposed to negative ones, and were grateful for the opportunities the FLOW program provided for self-reflection and self-discovery through conversations with the FLOW facilitator. One participant noted, “We were told to ‘focus on what we gained’ instead of the weight we were losing, that was really helpful.”

### **Program Improvement**

The final category that emerged from these semi-structured interviews concerned means for program improvement. While most of the feedback concerning the FLOW intervention program was positive, a few suggestions for improvement were given. Two individuals noted that they felt it was difficult to have FLOW sessions occurring simultaneously during cardiovascular exercise sessions. While most individuals considered the sessions a welcome distraction from the physiological responses to exercise, a few felt it was hard to concentrate on two tasks at the same time.

Another suggestion for program improvement included adding more staff to the program. As previously mentioned, most participants were impressed by the abilities of the sole FLOW facilitator to tackle every aspect of the intervention single handedly. It was mentioned that perhaps more program staff would be beneficial for the future of the FLOW program. One participant indicated potentially including more examples of different stress management techniques as well. And finally, two participants felt that having a bit more guidance for forward progress would be beneficial:

Basically I think everything in a way is good, it's just that some of us would still need a little more guidance, I guess you could say. I know she does well with everything and has done well with everything, but like I said, there's some people that need a little more pushing.

Additionally, two participants mentioned wanting to have more distinct tracking of goal progress throughout the intervention, such as keeping a journal or spreadsheet to help them indicate where progress has been made on certain goals and where they can continue to work for improvement. One final suggestion included finding a more private space to hold sessions. One participant noted she felt apprehensive talking about sensitive issues while in a gym where she felt other people may be able to overhear the conversation. She mentioned she liked having education sessions while doing cardio, but perhaps moving to walking on the track would be more beneficial for privacy than when on a cardio machine surrounded by other individuals.

This chapter provided a summary of the results from all avenues of data collection. Demographics of the sample were included along with descriptive statistics of the self-report questionnaires and intervention evaluations. Then, the observational notes of the

FLOW facilitator were discussed. Finally, the semi-structured interview categories were explained with anecdotal evidence from program participants.

## CHAPTER V

### DISCUSSION

The purpose of this study was to examine the feasibility of the FLOW intervention program to promote positive participant self-perceptions, increase self-efficacy, and encourage physical activity maintenance among program participants, as well as to assess the practicality of integrating the FLOW intervention as a part of the existing BELT program. A holistic case study approach (Merriam, 1998) examining the FLOW program was taken with this project in efforts to fully understand the effectiveness of the FLOW psychological skills intervention in promoting self-efficacy, positive self-perceptions, and readiness to adhere to a healthy lifestyle upon completion of the BELT program.

Three research questions were identified and explored throughout the course of this study. The first research question examined if the FLOW intervention program enhances participants' exercise self-efficacy, promotes positive self-perceptions, and encourages physical activity maintenance. This study is consistent with previous literature stating the importance of both exercise and behavior change intervention for post-bariatric surgery patients (Jassil et al., 2015; King et al., 2013; McMahon et al., 2006). Through several forms of evidence collected as a part of this study, these findings confirm that the FLOW intervention positively impacted each of these areas. Exercise self-efficacy mean scores increased throughout the intervention as assessed at weeks 1, 8,

and 16. Further evidence of this was seen through the program facilitator's interactions with participants and as part of interview responses. Examples of positive feedback from participants included, "Thank you for investing your time in me. I am so grateful for the FLOW program," and "I appreciate the continued positive energy and encouragement the FLOW facilitator provided throughout this program." FLOW program participants rated the program highly and provided anecdotal evidence of the usefulness of information provided, feelings of increased self-efficacy for exercise, and displayed confidence in their abilities to continue exercising upon graduation from the FLOW and BELT programs. Educational interventions have been found particularly effective for increasing self-efficacy (Vibulchai, Thansilp, & Preechawong, 2016; Carlson et al., 2001; Song, 2003).

### **Research Question One**

Positive effects on participant self-perceptions were seen throughout the FLOW intervention as well. Mean scores of social physique anxiety decreased throughout the intervention, while levels of physical activity increased. It should be noted that levels of self-efficacy for exercise were highest at the midpoint, while SPAS-7 scores were lowest at the midpoint. The reasoning for this is likely due to the timing of the intervention sessions on positive body image perceptions and self-confidence, which occurred right before the midpoint assessments were given. Additionally, many participants are apprehensive to leave the program and self-efficacy scores may have slightly dipped as a result of this. While it is possible that the level of physical activity increased as a result of BELT program participation, the direct positive impact on self-perceptions may be

attributed to the FLOW intervention. Overall, scores for SEE increased and SPA decreased. Prior to implementing the FLOW intervention into the BELT program, there was no focus on enhancing exercise self-efficacy or body image perceptions. The effectiveness of the FLOW intervention for increasing positive self-perceptions was seen in multiple contexts, as evidenced by the interview themes, observational field notes, and self-report questionnaires.

A major theme within the interviews was the impact of the FLOW program on participants' self-perceptions, with responses indicating the positive effect the intervention had on their self-confidence and overall self-esteem. Interventions aimed at increasing self-confidence and positive self-perceptions have been successful for facilitating behavior change (Alqout & Reynolds; 2014; Annesi & Gorjala, 2010b; Kubik et al., 2013; Scott, 2005). Another element that surfaced indicating the success of the intervention surrounded the amount of positive support and accountability the participants felt they received from the FLOW facilitator and throughout the duration of the intervention. Social support and accountability play an important role in behavioral change interventions (Buckworth et al., 2013; Dishman, Heath, & Lee, 2012). Participants indicated having social support made them feel more comfortable sharing their thoughts and feelings about intervention topics (Buckworth et al, 2013; Heath, 2013) and increased their ability to feel confident while exercising (Alqout & Reynolds, 2014; Hunt & Gross, 2009; Morgan et al., 2014). This was seen both as a result of the interview theme surrounding positive FLOW program experiences, positive facilitator interactions, and the program's positive impact on self-perceptions. These findings were

consistent with the facilitator's observational notes as well, indicating the verbal feedback from participants stating they felt more confident and comfortable while progressing through the FLOW program. This increased sense of confidence has impacted the hope of participants to successfully maintain a physically active lifestyle.

Throughout the FLOW intervention, participants mentioned that this program positively impacted their self-perceptions and increased exercise self-efficacy. Many participants also mentioned they felt hopeful about their future ability to remain physically active, reach a goal weight, and to continue to use the tools and skills learned in the FLOW program. The construct of "hope" has been linked to self-efficacy and physical activity behaviors. Snyder (2002) defined hope as, "the perceived capability to derive pathways to desired goals, and motivate oneself via agency thinking to use those pathways." Therefore, hope is considered a cognitive construct based on goals. Nothwehr, Clark, and Perkins (2013) examined hope in relation to behavioral strategies related to diet and physical activity among overweight adults. A negative association was demonstrated between level of hope, physical activity, and body mass index (BMI), as those with higher levels of BMI exhibited lower levels of hope and were less physically active. It was also found that those who engaged in self-monitoring behaviors exhibited stronger levels of hope. This ties back to Bandura's (2004) social cognitive theory, as self-monitoring, self-efficacy, and goal setting are essential components in the process of behavior change with relation to exercise. Therefore, the knowledge that engaging in physical activity increases levels of exercise adherence, self-efficacy, and hope in conjunction with self-monitoring behaviors (i.e. goal setting), may be an important link in

bridging the gap between active and inactive adults. Within the FLOW intervention, participants indicated feeling hopeful about their ability to remain physically active in the future due to increased self-efficacy for behavior change and exercise and through learning the psychological skills necessary for setting goals, managing stress, and making lasting behavioral changes.

### **Research Question Two**

A second research question explored which intervention strategies and resources are the most effective for enhancing positive self-perceptions and facilitating physical activity maintenance among overweight and obese individuals. Interview responses indicated that the most successful FLOW program interventions were goal setting, self-confidence, and stress management, while all intervention sessions were rated highly by participants in intervention evaluations. These results relate directly to Snyder's (2002) hope theory, as participants noted the importance of goal setting as a part of their participation in the program. Goal setting is a major component of hope theory, as those who set goals are more likely to exhibit high levels of hope not only in physical activity contexts, but also in all aspects of life (Snyder, 2002). Goal setting has been found to be a key component of behavioral change interventions (Annesi & Gorjala, 2010b) and useful for long-term adherence and behavioral change (Buckworth et al., 2013; Burton & Weiss, 2008; Locke & Latham, 1990; Murphy, 2005). FLOW program participants indicated learning to set goals increased their ability to feel confident in exercise settings and gave them something to focus their energy toward in a positive direction. Setting specific, measureable, action-oriented, realistic, and time-based goals helped participants to



enhance their ability to independently work toward these ambitions while feeling supported throughout the process (Annesi & Gorjala, 2010b; Murphy, 2005).

Goal setting not only gave participants something tangible to work toward, but also helped increase levels of self-confidence. This session followed directly after goal setting, and was found to be a second favorite of FLOW program participants. Many participants indicated they had never taken the time to consider how their thoughts and feelings integrated into the behavior change process, which is important for making lasting behavioral changes (Alqout & Reynolds; 2014; Annesi & Gorjala, 2010b). Increased self-confidence leads to feelings of self-efficacy within certain tasks, particularly among exercise settings as proposed by SCT (Bandura, 2004). These increased feelings of efficaciousness may lead to an increased likelihood of physical activity adherence over the long-term, especially among overweight and obese individuals (Bandura, 2004; Brawley et al., 2012; Morgan et al., 2014, Palmeira et al., 2007). Increased self-confidence and self-efficacy allow individuals to find more adaptive coping skills and overcome potential barriers (Bandura, 2004; Lazarus & Folkman, 1984).

Stress management was the third session indicated to be the most helpful by program participants. Learning effective strategies for managing stress and overcoming obstacles is an essential skill for avoiding relapse to previously unhealthy behaviors (Lazarus & Folkman, 1984). Stress may be temporarily reduced as a result of physical activity (Buckworth et al., 2013), however education about emotional regulation is also important for long-term maintenance of stress and being able to adequately adapt and

manage stressful situations (Murphy, 2005). As outlined by Lazarus and Folkman (1984), both types of coping were discussed for managing stress including problem-focused (efforts to alter or manage the problems that are causing stress) and emotion focused (regulating emotional responses to the problem that is causing the stress). FLOW program participants indicated that suggestions for stress management were immensely helpful for not only health-related behavior change, but translated to coping with stress in other areas of their personal lives as well. This in turn increased their feelings of efficacy for maintaining a physically active lifestyle by being able to manage stress and cope with unforeseen events. The success of these interventions sheds light onto the overall feasibility of effectively implementing this intervention into the existing BELT program.

### **Research Question Three**

The third and final research question concerned the feasibility of implementing the FLOW intervention into the existing BELT program. This study aimed to fill the gap in research adding a SCT-based behavioral change intervention to an exercise program for post-bariatric surgery patients in efforts to provide a comprehensive behavior change program (Hunt & Gross, 2009; Kalarchian & Marcus, 2015; Paul et al., 2015). Eleven participants have successfully completed the FLOW intervention as designed during their participation in the BELT program. As a result of their program participation, these individuals have demonstrated an increased sense of exercise self-efficacy (Vibulchai, Thansilp, & Preechawong, 2016; Carlson et al., 2001; Song, 2003), more positive self-perceptions including body image and self-confidence (Alqout & Reynolds; 2014; Annesi

& Gorjala, 2010b; Kubik et al., 2013; Scott, 2005), and a sense of hope for transitioning to maintaining a physically active lifestyle upon BELT graduation (Snyder, 2002).

While the FLOW intervention was feasible for the current researcher to implement into the BELT program, it should be noted that a few modifications may need to be made for future program implementation. In efforts to reduce the number of sessions for both participants and the interventionists, sessions may be combined. Self-confidence and positive body image perceptions will be put together, along with barriers and coping skills and stress management. This will minimize repetition in sessions and reduce the number of sessions in the intervention, thereby assisting with scheduling. Additionally, a few modifications will be made to the program including allowing a rotating schedule for sessions based on when participants enter the program. Goal setting will remain the first session, but all following sessions may be offered on a rotating schedule to help reduce the number of sessions. Participants may also be placed into groups for sessions. This will help the interventionist reduce the number of sessions to complete, and allow an increased sense of accountability and social support for group members to receive feedback, knowledge, and encouragement from peers in addition to that from the interventionist. As currently designed, the FLOW program met its designed objectives and provided a positive experience for program participants and the researcher. The combination of positive intervention evaluations, self-report questionnaires, and participant semi-structured qualitative interviews indicate the overall success of the FLOW intervention and feasibility for implementing the program as it stands into the BELT program. A few additional means for program improvement were identified by

both program participants and the FLOW interventionist, however, and will be discussed in the paragraphs that follow.

### **Program Improvement**

One potential area for program improvement involved the setting of the intervention sessions. A few participants noted they felt it was difficult to concentrate on session material while exercising and would have preferred the option to have education sessions without simultaneous exercise. This decision was made to negate participants losing time for cardiovascular exercise during their hour BELT program participation, but was not preferable for some participants. In the future, a choice could be offered to participants regarding the setting of their intervention to be conducted with exercise or without. A second area for improvement regarding exercise setting involved the privacy of the session. Participants noted enjoying having the session during cardiovascular exercise, but felt it was difficult to fully divulge information to the FLOW facilitator for fear of being overheard by other nearby. This could be solved by suggesting the participant and facilitator walk around the track together or find a more remote area for exercising to provide more privacy and comfort for the participant which would likely increase the usefulness of the sessions for participants due to a comfortable environment (Buckworth et al, 2013; Heath, 2013).

A second area for improvement involved goal tracking. Multiple participants indicated wanting a concrete tracking of goal progress to see changes throughout the intervention period. While the importance of the goal setting session as found to be a positive aspect of the overall program, specific means for tracking goals is preferable

among program participants. This increases participant self-awareness and their ability to self-monitor goal progress thereby enhancing the participants' ability to confidently transition to physical activity maintenance upon program termination (Annesi & Gorjala, 2010b; Buckworth et al., 2013; Burton & Weiss, 2008; Locke & Latham, 1990; Murphy, 2005).

The third area for improvement involves program logistics. First of all, a few of the intervention sessions may be combined in efforts to reduce repetitiveness of session content and to increase the ease of program implementation. Moving forward, the sessions of self-confidence and positive body image perceptions will be combined and the sessions concerning barriers and coping skills and stress management will also be merged. Additionally, a consensus was reached between program participants, BELT staff, and the FLOW facilitator that an increased number of trained FLOW program staff is necessary for successful intervention implementation. While the intervention was successful with one facilitator, the ease of implementation, tracking sessions, scheduling, and coordinating evaluations would operate more efficiently with additional program staff. One interventionist was initially used to provide consistency of session content and delivery for this study, however, moving forward it seems logical to increase FLOW program staff to increase the efficiency and ease of intervention implementation. These suggestions will improve the program for both staff and participants alike.

### **Limitations**

No research study is without limitations. Based on previous research (Annesi & Gorjala, 2010; Morgan et al., 2014; Rothberger, 2015), it was expected that activity level,

SPA, and SEE would positively change over the duration of the BELT program intervention. One potential limitation of this study included the possibility for social desirability, as participants completed self-report questionnaires with potentially emotionally sensitive material. Although these questionnaires were administered on three separate occasions and counterbalanced to control for order effects, participants may have tried to present themselves more positively while responding to the surveys, thus not accurately reflecting the prevalence, or lack thereof, of SPA, self-efficacy, physical activity level, or sedentary time. It should also be noted that participants may not have been as honest and open about their opinions of the intervention sessions on the intervention evaluations since they knew the FLOW facilitator was reviewing them.

In addition to social desirability within the self-report measures, another limitation of this study was the lack of feedback regarding program improvements from participants. In both the intervention evaluations and interviews, participants provided few suggestions for program improvement or parts of the program they would like to see changed. This could potentially be due to participants being apprehensive of saying negative comments about the program due to their close relationship with the FLOW facilitator. Although the FLOW facilitator (researcher) did not conduct the interviews to avoid response bias, this still may have been an issue for eliciting feedback from participant regarding areas for program improvement.

Another limitation of this study was limited external validity of the results due to the purposive sampling to include overweight and obese adults who have undergone bariatric surgery. The small sample size also poses a threat to the external validity, as the

individuals who completed the intervention may possess particular characteristics that would set them apart from others who were not a part of this study. This small sample also did not allow for statistical analysis due to the lack of power. Future research should aim to include a larger sample of participants in efforts to statistically evaluate differences both within and between participants on self-report measures over time.

Attrition was the final limitation, as some individuals did not complete the entire 16-week BELT exercise program. While 11 out of 18 participants completed the program, seven of these individuals dropped out within the first five weeks of the program. This is consistent with previous research stating a roughly 40% dropout rate for individuals adhering to a behavior change program (Buckworth et al., 2013). Reasons for dropping out were stated as changes in employment, family issues, or injury. There may have been certain characteristics of the individuals that dropped out of the program that may have added value to the study, however little data could be collected from this part of the sample. Future research should target following both those who complete the intervention and those who drop out. The lack of a control group and inability to randomize the sample posed an additional threat to this work. However, as a feasibility study where all participants receive the intervention in efforts to maximize beneficence for those involved, this is less of a concern.

### **Threats to Trustworthiness**

Additionally, several threats to trustworthiness occurred that could have potentially impacted the credibility of these findings. Those threats, outlined by Patton (2002), included a small sample size, limited time to complete data collection, personal

biases of the researchers, and the ability of interviewers and observers to potentially manipulate data collection through bias and distracting participants. Therefore, a series of efforts to maintain the trustworthiness and credibility of the data were incorporated as a part of the data collection process.

### **Assurance of Research Quality**

In efforts to conduct quality research, several precautionary measures were taken. To combat the potential for a social desirability effect, SPA and exercise self-efficacy questionnaires were administered at multiple time points throughout the 16-week duration of the program to increase the likelihood of providing an accurate measure of each construct. Counterbalancing was used in efforts to decrease the possibility of order effects and survey fatigue with the multiple points of survey administration throughout one data collection cycle. Conducting multiple cycles of evaluation helped to combat the threat of attrition and increased the sample size of participants included in the evaluation.

Trustworthiness and credibility of the data were established in a variety of ways. The use of multiple avenues of data collection, including self-report questionnaires, intervention evaluations, field notes, and interviews provided different angles for data analysis and confirmation of established themes. Further efforts to ensure credible and trustworthy qualitative data were established through the use of member checking. Full transcripts were sent to interview participants so they could confirm responses were accurate and complete (Patton, 2002). Participants were encouraged to include additional pertinent information if necessary. Once the data was analyzed, themes were also sent participants in efforts to seek consistency of meaning with participant responses.



### **Future Directions and Implications**

This study was the first of its kind to implement a behavioral change intervention into an existing exercise program for post-bariatric surgery patients (Hunt & Gross, 2009; Kalarchian & Marcus, 2015; Paul et al., 2015). To address gaps in previous literature (Brawley et al., 2012; Morgan et al, 2014), this study employed a SCT-based focus on bolstering self-efficacy throughout the intervention in efforts to facilitate lasting physical activity adherence. Results of this study indicated that the FLOW intervention program successfully increased participant exercise self-efficacy, enhanced positive self-perceptions, and facilitated the transition to physical activity maintenance. Additionally, findings indicate it is feasible to implement FLOW into the existing BELT program, and has been integrated as a permanent part of the program moving forward. Future research should focus on broadening the target population and improving the FLOW intervention.

While the FLOW intervention has been deemed to be successful in a sample of post-bariatric surgery patients, this intervention may be extended to include a wider range of individuals in other clinical populations. A gap in previous research has been identified within cardiovascular rehabilitation settings that couples exercise intervention with behavior change and efforts to increase self-efficacy (Vibulchai, Thansilp, & Preechawong, 2016; Carlson et al., 2001; Song, 2003). Therefore, the FLOW intervention may be implemented into a cardiovascular rehabilitation setting to test the effectiveness of increasing self-efficacy and physical activity maintenance among cardiac rehabilitation patients. Additional populations of interest may be overweight or obese individuals who have not had bariatric surgery and are partaking in exercise programs (Annesi & Gorjala,

2010b; Morgan et al., 2014). The FLOW intervention has the ability to transfer to multiple clinical settings based on the broad scope of individuals who may benefit from a psychological skills intervention aimed at behavior change (Bandura, 2004).

Additionally, another future direction in this area is to improve the FLOW intervention in efforts to make it more user friendly for both program participants and the FLOW facilitator. Reducing the number of sessions through combination of similar topics will be beneficial from a logistical standpoint and encourage more participant engagement in each session. Conducting a longer follow-up period would also be beneficial moving forward to assess the maintenance of physical activity over the long-term. Future studies should include tracking participants for at least six months upon intervention completion in efforts to assess if the maintenance stage of exercise adherence has been reached (Buckworth et al, 2013; Dishman & Dunn, 2010). One further means of intervention improvement would be the use of specific goal tracking devices, whether a written journal or online spreadsheet, to help participants gauge goal progress throughout the course of the intervention. It may also be interesting to explore implementing the intervention online in efforts to provide access for those who would prefer to learn remotely or may not feel comfortable exercising in social settings (Morgan et al., 2014; Paul et al., 2015).

### **Conclusions**

The goal of this study was to implement a SCT-based psychological skills intervention into an exercise program for post-bariatric surgery patients. This study was the first of its kind to link exercise and behavioral change intervention as adjunctive

treatments for weight loss in this population. Findings indicated that this intervention was feasible to implement into the existing BELT program, rated positively by participants, effective for increasing exercise self-efficacy, enhancing positive self-perceptions, and facilitating the transition to physical activity maintenance among program participants. Future research should consider implementing this intervention with other clinical populations and improving the existing intervention. While behavior change may be an arduous task, a simple solution is to go with the FLOW.

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## APPENDIX A

### MEASURES

#### INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

#### LONG LAST 7 DAYS SELF-ADMINISTERED FORMAT

#### FOR USE WITH YOUNG AND MIDDLE-AGED ADULTS (15-69 years)

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous and moderate activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal.

#### ***PART 1: JOB-RELATED PHYSICAL ACTIVITY***

The first section is about your work. This includes paid jobs, farming, volunteer work, course work, and any other unpaid work that you did outside your home. Do not include unpaid work you might do around your home, like housework, yard work, general maintenance, and caring for your family. These are asked in Part 3.

1. Do you currently have a job or do any unpaid work outside your home?

Yes

No 

Skip to PART 2: TRANSPORTATION

The next questions are about all the physical activity you did in the last 7 days as part of your paid or unpaid work. This does not include traveling to and from work.

2. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, heavy construction, or climbing up stairs as part of your work? Think about only those physical activities that you did for at least 10 minutes at a time.

\_\_\_\_\_ days per week

No vigorous job-related physical activity



Skip to question 4

3. How much time did you usually spend on one of those days doing vigorous physical activities as part of your work?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

4. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads as part of your work? Please do not include walking.

\_\_\_\_\_ days per week

No moderate job-related physical activity      **➔** Skip to question 6

5. How much time did you usually spend on one of those days doing moderate physical activities as part of your work?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

6. During the last 7 days, on how many days did you walk for at least 10 minutes at a time as part of your work? Please do not count any walking you did to travel to or from work.

\_\_\_\_\_ days per week

No job-related walking      **➔** Skip to PART 2: TRANSPORTATION

7. How much time did you usually spend on one of those days walking as part of your work?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

***PART 2: TRANSPORTATION PHYSICAL ACTIVITY***

These questions are about how you traveled from place to place, including to places like work, stores, movies, and so on.

8. During the last 7 days, on how many days did you travel in a motor vehicle like a train, bus, car, or tram?

\_\_\_\_\_ days per week

No traveling in a motor vehicle      **➔** Skip to question 10

9. How much time did you usually spend on one of those days traveling in a train, bus, car, tram, or other kind of motor vehicle?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

Now think only about the bicycling and walking you might have done to travel to and from work, to do errands, or to go from place to place.

10. During the last 7 days, on how many days did you bicycle for at least 10 minutes at a time to go from place to place?

\_\_\_\_\_ days per week

No bicycling from place to place



Skip to question 12

11. How much time did you usually spend on one of those days to bicycle from place to place?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

12. During the last 7 days, on how many days did you walk for at least 10 minutes at a time to go from place to place?

\_\_\_\_\_ days per week

No walking from place to place



Skip to PART 3:  
HOUSEWORK, HOUSE  
MAINTENANCE, AND  
CARING FOR FAMILY

13. How much time did you usually spend on one of those days walking from place to place?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

***PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY***

This section is about some of the physical activities you might have done in the last 7 days in and around your home, like housework, gardening, yard work, general maintenance work, and caring for your family.

14. Think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, chopping wood, shoveling snow, or digging in the garden or yard?

\_\_\_\_\_ days per week

No vigorous activity in garden or yard



Skip to question 16

15. How much time did you usually spend on one of those days doing vigorous physical activities in the garden or yard?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

16. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate activities like carrying light loads, sweeping, washing windows, and raking in the garden or yard?

\_\_\_\_\_ days per week

No moderate activity in garden or yard



Skip to question 18

17. How much time did you usually spend on one of those days doing moderate physical activities in the garden or yard?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

18. Once again, think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate activities like carrying light loads, washing windows, scrubbing floors and sweeping inside your home?

\_\_\_\_\_ days per week

No moderate activity inside home



Skip to PART 4:  
RECREATION, SPORT  
AND LEISURE-TIME  
PHYSICAL ACTIVITY

19. How much time did you usually spend on one of those days doing moderate physical activities inside your home?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

#### ***PART 4: RECREATION, SPORT, AND LEISURE-TIME PHYSICAL ACTIVITY***

This section is about all the physical activities that you did in the last 7 days solely for recreation, sport, exercise or leisure. Please do not include any activities you have already mentioned.

20. Not counting any walking you have already mentioned, during the last 7 days, on how many days did you walk for at least 10 minutes at a time in your leisure time?

\_\_\_\_\_ days per week

No walking in leisure time



Skip to question 22

21. How much time did you usually spend on one of those days walking in your leisure time?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

22. Think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do vigorous physical activities like aerobics, running, fast bicycling, or fast swimming in your leisure time?

\_\_\_\_\_ days per week

No vigorous activity in leisure time



Skip to question 24

23. How much time did you usually spend on one of those days doing vigorous physical activities in your leisure time?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

24. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do moderate physical activities like bicycling at a regular pace, swimming at a regular pace, and doubles tennis in your leisure time?

\_\_\_\_\_ days per week

No moderate activity in leisure time



Skip to PART 5: TIME  
SPENT SITTING

25. How much time did you usually spend on one of those days doing moderate physical activities in your leisure time?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

#### ***PART 5: TIME SPENT SITTING***

The last questions are about the time you spend sitting while at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television. Do not include any time spent sitting in a motor vehicle that you have already told me about.

26. During the last 7 days, how much time did you usually spend sitting on a weekday?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

27. During the last 7 days, how much time did you usually spend sitting on a weekend day?

\_\_\_\_\_ hours per day

\_\_\_\_\_ minutes per day

This is the end of the questionnaire, thank you for participation.

### Self-efficacy for Exercise (SEE) Scale

The items listed below are designed to assess your beliefs in your ability to continue exercising on a three time per week basis at moderate intensities (upper end of your perceived exertion range), for **20+** minutes per session given the following situations. Using the scales listed below please indicate how confident you are that you will be able to continue to exercise in the future.

For example, if you have complete confidence that you could exercise three times per week at moderate intensity for **20+** minutes when the weather was bothering you, you would **circle 10**. However, if you had no confidence at all that you could exercise when the weather was bothering you, (that is, confident you would not exercise), you would **circle 0**.

|  | Not Confident |   |   |   |   |   | Very Confident |   |   |   |    |  |
|--|---------------|---|---|---|---|---|----------------|---|---|---|----|--|
| 1. The weather was bothering you             | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |
| 2. You were bored by the program or activity | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |
| 3. You felt pain when exercising             | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |
| 4. You had to exercise alone                 | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |
| 5. You did not enjoy it                      | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |
| 6. You were too busy with other activities   | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |
| 7. You felt tired                            | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |
| 8. You felt stressed                         | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |
| 9. You felt depressed                        | 0             | 1 | 2 | 3 | 4 | 5 | 6              | 7 | 8 | 9 | 10 |  |

\*\*\*\*\*

*Scoring: Sum all items to provide a total score ranging from 0-90. A higher score indicates higher self-efficacy for exercise.*

### 7-item Social Physique Anxiety Scale (SPA-7)

The following questionnaire contains statements concerning your body physique or figure. By physique or figure we mean your body's form and structure; specifically, body fat, muscular tone, and general body proportions.

Instructions: Read each item carefully and indicate how characteristic it is of you according to the following scale.

1 = Not at all characteristic of me

2 = Slightly characteristic of me

3 = Moderately characteristic of me

4 = Very characteristic of me

5 = Extremely characteristic of me

\_\_\_\_\_ 1. I wish I was not so up-tight about my physique or figure.

\_\_\_\_\_ 2. There are times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively.

\_\_\_\_\_ 3. Unattractive features of my physique/figure make me nervous in certain social settings.

\_\_\_\_\_ 4. In the presence of others, I feel apprehensive about my physique or figure.

\_\_\_\_\_ 5. I am comfortable with how fit my body appears to others.

\_\_\_\_\_ 6. It would make me uncomfortable to know others were evaluating my physique/figure.

\_\_\_\_\_ 7. When it comes to displaying my physique or figure to others, I am a shy person

\*\*\*\*\*

*Scoring: Sum all items to provide a total score ranging from 0-35. A higher score indicates higher prevalence of social physique anxiety*



## Intervention Evaluation

*\*Note: This intervention evaluation will be given for each educational topic including goal setting (week 2), self-confidence (week 4), body image perceptions (week 5), barriers and coping skills (week 7), exit strategies (week 8), stress management (week 11), behavioral commitment (week 12), and motivational resources (week 15)*

Please rate the following items regarding the components of the FLOW intervention.

1. On a scale of 1 to 5, how useful was the goal setting presentation?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

2. On a scale of 1 to 5, how clearly was the information on goal setting presented?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

3. On a scale of 1 to 5, how likely are you to use the information from the goal setting presentation?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

4. Do you have any comments about what was particularly good about the session, or suggestions for improving the goal setting part of the intervention?

## Final Intervention Evaluation (Week 16)

Please rate the following items regarding the components of the FLOW intervention.

The following is a list of the topics covered in the FLOW intervention program.

- Goal Setting – week 2
- Self-Confidence – week 4
- Body Image Perceptions – week 5
- Barriers and Coping Skills – week 7
- Exit Strategies – week 8
- Stress Management – week 11
- Behavioral Commitment – week 12
- Motivational Resources – week 15

Please indicate the usefulness of each of these interventions on the following scales.

1. On a scale of 1 to 5, how useful was the goal setting session?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

2. On a scale of 1 to 5, how useful was the self-confidence session?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

3. On a scale of 1 to 5, how useful was the body image perceptions session?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

4. On a scale of 1 to 5, how useful was the barriers and coping skills session?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

5. On a scale of 1 to 5, how useful was the exit strategies session?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

6. On a scale of 1 to 5, how useful was the stress management session?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

7. On a scale of 1 to 5, how useful was the behavioral commitment session?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

8. On a scale of 1 to 5, how useful was the motivational resources session?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

9. Please list the top three sessions that were the most useful to you in the FLOW intervention.

10. Why were these sessions the most helpful?

#### Overall Evaluation of the FLOW Program

On a scale of 1 to 5, how useful was the overall FLOW intervention program?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

On a scale of 1 to 5, how clearly was the information of the FLOW program presented?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

How likely are you to use the information in the FLOW program?

|            |   |          |   |      |
|------------|---|----------|---|------|
| Not at all |   | Somewhat |   | Very |
| 1          | 2 | 3        | 4 | 5    |

11. Please add any comments about what was particularly good about the FLOW program.

12. Please add any suggestions for improving the FLOW program.

## APPENDIX B

### INTERVIEW SCRIPT

Hello! My name is \_\_\_\_\_ and I will be conducting this interview today. Thank you for agreeing to partake in this interview process and for participating in the BELT program with FLOW psychological skills intervention. You are taking part in an interview that will last approximately 1 hour. Your responses will remain confidential and you may choose to end the interview process at any time without penalty. Do you agree to these terms? (wait for response). Thank you, let's begin.

As a reminder, the BELT program is a 16-week exercise program including 30-minutes of resistance and flexibility training and 30-minutes of cardiovascular exercise. The FLOW program is a 16-week psychological skills intervention in which you received educational information sessions, completed worksheets, and had one-on-one interaction with Sara. Here is an outline of the topics discussed (see attached). The following questions are going to ask you about your experiences in this program.

1. This program consists of cardiovascular training, resistance and flexibility training, nutritional education sessions, exercise instruction and injury prevention sessions, and a behavioral change intervention. How helpful did you feel each of these components were during your time in the BELT program?
2. The FLOW program is a 16-week psychological skills intervention in which you received educational information sessions, completed worksheets, and had one-on-one interaction with Sara.

We are now going to explore each individual topic of the FLOW program. As a reminder here is the list of topics included (list will be given to participants).

3. How would you evaluate the goal setting session? What was particularly good, or how might the session be improved?
4. How would you evaluate the self-confidence session? What was particularly good, or how might the session be improved?
5. How would you evaluate the body image perceptions session? What was particularly good, or how might the session be improved?
6. How would you evaluate the identifying barriers and coping skills session? What was particularly good, or how might the session be improved?
7. How would you evaluate the exit strategies session? What was particularly good, or how might the session be improved?
8. How would you evaluate the stress management session? What was particularly good, or how might the session be improved? How would you evaluate the

behavioral commitment session? What was particularly good, or how might the session be improved?

9. How would you evaluate the motivational resources session? What was particularly good, or how might the session be improved?

We are now going to discuss your perceptions of the program and your personal experiences throughout this process.

10. Overall, which part of FLOW program was most helpful and how do you feel the program could be improved? (Use follow-up if improvement is not mentioned).

Now think back to the BELT program as a whole.

11. Overall, which part of BELT program was most helpful and how do you feel the program could be improved? (Use follow-up if improvement is not mentioned).

We are interested in how you will continue your physical activity after BELT.

12. What is your plan for remaining physically active after the BELT and FLOW programs?
13. How have the BELT and FLOW programs helped you get ready for continuing physical activity?
14. How confident are you that you will be able to continue with your physical activity routine after the BELT and FLOW programs?
15. What would keep you from being physically active after leaving this program?
16. Is there anything else you would like to add about the FLOW program, the BELT program, or anything else?

Thank you for participating in this interview. Your transcript will be sent to you once it has been transcribed so you may check the accuracy of your responses. A summary of all participant responses will also be sent to you. If you have any additional questions or concerns, please contact Sara Rothberger at [smrothbe@uncg.edu](mailto:smrothbe@uncg.edu)

\*\*\*\*\*

In order to gain a deeper understanding of the participants' experiences, they will be asked to expand on their responses with the use of probing questions, such as:

1. You mentioned \_\_\_\_\_. Elaborate further on that.
2. When you say \_\_\_\_\_, what do you mean?
3. Tell me more about \_\_\_\_\_

APPENDIX C

FLOW INTERVENTION OUTLINE

*Following a Lifestyle of Wellness*

*Go with the FLOW – change your body, change your mind, change your life*

**Program Guide**

## **Background Information**

The Bariatric Exercise Lifestyle Transformation (BELT) program, in collaboration with Cone Health, is designed to help individuals who have undergone bariatric surgery adopt a physically active lifestyle. This program has been successfully operating for over six years with high levels of exercise adherence and positive participant feedback. The BELT program is 16-weeks in duration and includes a one hour of exercise three days per week for adults. Program structure includes the of each session first 30 minutes are devoted to resistance training for increasing muscular strength and flexibility followed by 30 minutes of cardiorespiratory exercise for increasing cardiorespiratory endurance and promoting caloric expenditure. The BELT program includes educational sessions on goal-setting, injury prevention, proper exercise technique, and nutrition within the program. However, little research to the transition from the 16-week BELT program to lifestyle physical activity.

Therefore, the Following a Lifestyle of Wellness (FLOW) program is a supplement to the BELT program, which includes educational sessions on a variety of psychological skills important for physical activity maintenance (i.e. goal setting, relapse prevention, planning for the future, overcoming barriers, building self-confidence, and promoting healthy body image perceptions). This program is designed to help participants gain the tools and knowledge to continue exercising upon graduation from the BELT program.

The foundational theory for this work lies in Bandura's (2004) Social Cognitive Theory. This theory posits that individuals have the ability to change behaviors through increasing self-awareness, implementing self-regulatory skills, setting goals, and exhibiting the intent and motivation to make changes. The main components of this theory include outcome expectancies, outcome values, self-efficacy, intentions to change behavior, and triadic reciprocity. Outcome expectancies involve an individual's appraisal of the effectiveness of an intervention to change behavior along with the costs and benefits of engaging in a certain behavior. Outcome values are determined by the individual's perceptions of potential positive or negative results of engaging in a certain behavior, and can be influenced by internal and external factors (i.e. personality characteristics or rewards). Intention include the individual's level of readiness to make a change and may be influenced by levels of self-efficacy, or feelings of competence and confidence in being able to successfully carry out a certain task. Self-efficacy is one of the key components of SCT and is therefore a variable of particular interest in my line of research. Finally, triadic reciprocity indicates that personal, environmental, and social factors should be taken into consideration when implementing interventions to change behavior using SCT. This theory emphasizes that behavior is a product of both the person and the environment, and therefore a holistic view from multiple perspectives is optimal for lasting behavior change.

The importance of promoting physical activity participation and adherence in the proposed target population of overweight and obese individuals is supported by the rapidly increasing prevalence rates of individuals who are classified as overweight (BMI  $\geq 25$  kg/m<sup>2</sup>) or obese (BMI  $\geq 30$  kg/m<sup>2</sup>) and is projected to continue to rise over time (Flegel et al., 2010, WHO, 2010). The United States Department of Health and Human Services (USDHHS, 2008) proposed physical activity guidelines for adults including 150-minutes of moderate intensity physical activity or 75-minutes of vigorous intensity physical activity per week along with two to three days of muscle strength and flexibility training to receive health-related benefits and decrease risks of obesity related comorbidities (i.e. cardiovascular disease, type II diabetes, hypertension, sleep apnea). According to the CDC (2015), 66% of adults are currently not meeting physical activity guidelines. The positive benefits of physical activity on health are well-established, as regular physical activity not only decreases disease risk (CDC, 2015), but also improves mental health, body image satisfaction, and overall quality of life (Bond et al., 2009; Jassil et al., 2015). Therefore, the use of physical activity intervention combined with a SCT-based psychological skills intervention may be beneficial for promoting lasting physical activity participation and adherence.

Research has demonstrated that body image related concerns are prevalent within overweight and obese individuals, and it has been established that greater body image dissatisfaction leads to lower levels of self-efficacy and decreased quality of life (Alqout & Reynolds, 2014,; Pona, et al., 2016). One particular area of interest that is directly correlated to exercise settings is Social Physique Anxiety (SPA), which is defined as feelings of anxiety and/or fear associated with having one's body on display (Hart, Leary, & Rejeski, 1989; Leary, 1992). It has been found that exercise interventions have been successful in promoting exercise self-efficacy and decreasing social physique anxiety (Crawford & Eklund, 1994; Hausenblas & Downs, 2001; Rothberger et al., 2015). Furthermore, it has been determined that exercise self-efficacy has increased as a result of exercise intervention in overweight and obese individuals (Annesi & Gorjala, 2010a; Morgan et al., 2014). Morgan and colleagues (2014) used SCT as the basis of an exercise intervention in overweight men, and found that exercise self-efficacy, outcome expectancies for exercise, goal setting ability, and overall quality of life increased as a result of a combined exercise and psychological skills intervention. Therefore, the FLOW program takes a theory and evidence-based practical approach to implementing a psychological skills intervention within a bariatric population.



## How to “Go with the *FLOW*”

The FLOW intervention program begins as you start your 16-week BELT journey. Our overall goal is to help you gain the skills and knowledge to feel confident continuing on your newly established lifestyle of wellness after you leave the BELT program. The first six weeks of the program focus on building psychological skills necessary for making a lasting lifestyle change, setting goals, and increasing self-confidence as you transition to a happier and healthier you both inside and out! The second half of the FLOW program focuses specifically on maintaining a healthy lifestyle following your graduation from the BELT program. This will include establishing a long-term activity plan, identifying social support, and building confidence in your ability to “go with the FLOW”. Each week will focus on a psychological skill and topic or activity in preparation for your upcoming transition. Psychological skills and topics of emphasis will include goal setting, self-confidence building, anxiety reduction and stress management, and developing positive body image perceptions. Multiple meetings with a FLOW consultant will be scheduled in efforts to tailor the intervention to your specific needs.

### Week 1

- Program Introduction/Overview

### Week 2

- Goal Setting
  - Information sent to participant in advance via email
  - During the 30-minute session work through worksheet with facilitator
  - Complete assessment sent via email after the session

### Week 3

- Informal check in on participant progress during exercise session

### Week 4

- Building self-confidence
  - Information sent to participant in advance via email
  - During the 15-minute session work through worksheet with facilitator
  - Complete assessment sent via email after the session

### Week 5

- Positive body image perceptions
  - Information sent to participant in advance via email
  - During the 15-minute session work through worksheet with facilitator
  - Complete assessment sent via email after the session

### Week 6

- Informal check in on participant progress during exercise session

### **Week 7**

- Identifying barriers and coping skills
  - Information sent to participant in advance via email
  - During the 15-minute session work through worksheet with facilitator
  - Complete assessment sent via email after the session

### **Week 8**

- Hand out exit strategy document (long-term activity program)
- Introduce exit strategy and schedule week 9 meeting
  - Information sent to participant in advance via email
  - During the 10-minute session work through worksheet with facilitator
  - Complete assessment sent via email after the session

### **Week 9**

- Initial completion of exit strategy document and second goal setting/exit strategy meeting
  - Information sent to participant in advance via email
  - During the 15-minute session work through worksheet with facilitator
  - Complete assessment sent via email after the session

### **Week 10**

- Informal check in on participant progress during exercise session

### **Week 11**

- Revisit revised exit strategy document
- Stress management session
  - Information sent to participant in advance via email
  - During the 10--minute session work through worksheet with facilitator
  - Complete assessment sent via email after the session

### **Week 12**

- Informal check in on participant progress during exercise session
- Revisit action plan and means for overcoming barriers

### **Week 13**

- Take action stage
- Complete behavioral commitment form
  - Information sent to participant in advance via email
  - During the 15-minute session work through worksheet with facilitator
  - Complete assessment sent via email after the session

### **Week 14**

- Solidify action/behavioral plan
- Revisit self-confidence

**Week 15**

- Provide additional resources depending on individual interest
- Motivational resources and goal follow-up

**Week 16**

- Solidify transition plan
- Complete exit interview
- Complete assessment of whole FLOW intervention sent via email after the session
- Take home FLOW workbook for future reference

**Week 20**

- Complete online assessment of whole FLOW intervention, email to check in on progress

## GOAL SETTING HANDOUT

### Go for the GOAL

In *The Sport Psych Handbook* authored by Shane Murphy (2005), goal setting helps athletes to identify what can be considered either successes or failures through achievement goals. Feeling competent in one's ability to reach a certain goal, say exercising for 30-minutes on five days a week, increases self-confidence and overall enjoyment of the sport. According to Murphy (2005), there are a few certain elements that should be taken into consideration when setting goals:

- Integrate both short and long-term goals into a plan.
- Make the goals specific, measurable, attainable, realistic yet challenging, and time-based (SMART goals!).
  - Specific: "I want to run a 5K in May: versus non-specific, "I want to run more"
  - Measureable: Pick a goal you can observe or measure (i.e. over time, distance, weight, strength increases etc.)
  - Action-Oriented: Goals should encompass specific actions to be accomplished (i.e. lifting weights three days per week)
  - Realistic: Choose a goal you feel you can attain, and one that is challenging but able to be feasibly achieved within a set time-frame
  - Time-Based: Pick a specific date for the goal to be achieved. Is it this week? Three months from now? A year down the road?
- Allow for reevaluation and modification of the goals that are set. This flexibility allows room for certain things that may be out of one's control (such as bad weather, injury, illness, lack of time, etc.).
- Write goals down and post them in a place where you can see them regularly. This serves as a reminder and helps hold you accountable.
- Tell your friends and family about them so they can help you track your progress.

Now that you are familiar with how to set effective exercise and dietary goals for your lifestyle change, you are ready to start mapping out appropriate goals for your program. Use the chart below to help come up with effective goals using the SMART principle to assist you.

**A.** \_\_\_\_\_

**B.** \_\_\_\_\_

**C.** \_\_\_\_\_

| GOAL     | STRATEGIES TO COMPLETE GOAL (THE PROCESS) | POTENTIAL BARRIERS TO THIS GOAL | HOW I WILL OVERCOME THE BARRIERS | WHO CAN HELP ME ACHIEVE MY GOALS | WHEN GOAL IS TO BE ACHIEVED |
|----------|---|---------------------------------|----------------------------------|----------------------------------|-----------------------------|
| <b>A</b> |   |                                 |                                  |                                  |                             |
| <b>B</b> |   |                                 |                                  |                                  |                             |
| <b>C</b> |   |                                 |                                  |                                  |                             |

Place an “X” next to each of the criteria you have met or plan to meet:

- \_\_\_\_\_ I have set both LONG and SHORT term goals.
- \_\_\_\_\_ These goals are specific can be easily measured.
- \_\_\_\_\_ I have developed strategies for attaining these goals.
- \_\_\_\_\_ These goals will be challenging, but not impossible to reach.
- \_\_\_\_\_ I can modify these goals during my program to accommodate my schedule and potential barriers while making them more appropriate for me.

## SELF-CONFIDENCE

### Identifying “A-HA!” Moments

List some things about weight loss that have given you an "A-ha!" in the past couple of weeks. It could be something that really stuck out to you, something important you learned that you didn't know before, something you realized that you hadn't thought about before, something that makes sense that didn't make sense before, something you've really committed to do, etc.

**I AM WORTH IT!!!**

**My strengths are:**

**Things I have achieved are:**

**Things I admire about myself are:**

*“To wish you were someone else is to waste the person you are!” – Anonymous*

## POSITIVE BODY IMAGE PERCEPTIONS

(Adapted from National Eating Disorders Association, 2016)

### 10 Steps to Positive Body Image

One list cannot automatically tell you how to turn negative body thoughts into positive body image, but it can introduce you to healthier ways of looking at yourself and your body. The more you practice these new thought patterns, the better you will feel about who you are and the body you naturally have.

1. Appreciate all that your body can do. Every day your body carries you closer to your dreams. Celebrate all of the amazing things your body does for you—running, dancing, breathing, laughing, dreaming, etc.
2. Keep a top-ten list of things you like about yourself—things that aren't related to how much you weigh or what you look like. Read your list often. Add to it as you become aware of more things to like about yourself.
3. Remind yourself that “true beauty” is not simply skin deep. When you feel good about yourself and who you are, you carry yourself with a sense of confidence, self-acceptance, and openness that makes you beautiful regardless of whether you physically look like a supermodel. Beauty is a state of mind, not a state of your body.
4. Look at yourself as a whole person. When you see yourself in a mirror or in your mind, choose not to focus on specific body parts. See yourself as you want others to see you—as a whole person.
5. Surround yourself with positive people. It is easier to feel good about yourself and your body when you are around others who are supportive and who recognize the importance of liking yourself just as you naturally are.
6. Shut down those voices in your head that tell you your body is not “right” or that you are a “bad” person. You can overpower those negative thoughts with positive ones. The next time you start to tear yourself down, build yourself back up with a few quick affirmations that work for you.
7. Wear clothes that are comfortable and that make you feel good about your body. Work with your body, not against it.
8. Become a critical viewer of social and media messages. Pay attention to images, slogans, or attitudes that make you feel bad about yourself or your body. Protest these messages: write a letter to the advertiser or talk back to the image or message

9. Do something nice for yourself--something that lets your body know you appreciate it. Take a bubble bath, make time for a nap, find a peaceful place outside to relax.
10. Use the time and energy that you might have spent worrying about food, calories, and your weight to do something to help others. Sometimes reaching out to other people can help you feel better about yourself and can make a positive change in our world.



## 10 “Will Powers” for Improving Body Image

*Adapted from NEDA, Michael Levine, PhD and Linda Smolak, PhD*

**I WILL** ask myself: “Am I benefiting from focusing on what I believe are flaws in my body weight or shape?”

**I WILL** think of three reasons why it is ridiculous for me to believe that thinner people are happier or “better.” I will repeat these reasons to myself whenever I feel the urge to compare my body shape to someone else’s.

**I WILL** spend less and less time in front of mirrors—especially when they are making me feel uncomfortable and self-conscious about my body.

**I WILL** exercise for the joy of feeling my body move and grow stronger. I will not exercise simply to lose weight, purge fat from my body, or to “make-up” for calories I have eaten.

**I WILL** participate in activities that I enjoy, even if they call attention to my weight and shape. I will constantly remind myself that I deserve to do things I enjoy, like dancing, swimming, etc., no matter what my shape or size is!

**I WILL** refuse to wear clothes that are uncomfortable or that I do not like but wear simply because they divert attention from my weight or shape. I will wear clothes that are comfortable and that make me feel at home in my body.

**I WILL** list 5 to 10 good qualities that I have, such as understanding, intelligence, or creativity. I will repeat these to myself whenever I start to feel bad about my body.

**I WILL** practice taking people seriously for what they say, feel, and do. Not for how slender, or “well put together” they appear.

**I WILL** surround myself with people and things that make me feel good about myself and my abilities. When I am around people and things that support me and make me feel good, I will be less likely to base my self-esteem on the way my body looks.

**I WILL** treat my body with respect and kindness. I will feed it, keep it active, and listen to its needs. I will remember that my body is the vehicle that will carry me to my dreams!

## COPING SKILLS HANDOUT

### What is coping?

*“A process of constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands or conflicts appraised as taxing or exceeding one’s resources” (Lazarus & Folkman, 1984)*

### Coping is the way we learn to “dance in the rain”.

Each of us have different coping styles:

- **Problem-focused:** efforts to alter or manage the problems that are causing stress
  - **For example:** gathering information about the situation, goal setting, time management skills, using positive self-talk
- **Emotion focused:** regulating emotional responses to the problem that is causing the stress
  - **For example:** relaxation techniques, medication, reappraisal of the situation
  - **“CONTROL THE CONTROLLABLES”**
- **Avoidance:** not coping, leads to increased stress which can cause illness, injury, or decreased quality of life over time

It is best to learn to use both types of strategies to be able to face any situation thrown our way!

### Effective Coping Strategies:

- Be positive!
- Make the choice not to over-react to stressors and deal with them one at a time
- Take an objective view of your stressor (step outside the box)
- Communicate!
- Accept yourself (no one is perfect)
- Find social support
- Learn from your mistakes
- Develop self-discipline and control
- Practice skills regularly to become resilient

## EXIT STRATEGIES HANDOUT

### Long-term Activity Plan

*Please complete this questionnaire as part of your planning for your healthy lifestyle program after you transition out of the BELT program. Be as specific as possible for your physical activity plan each week.*

1. Do you plan on joining a gym, health club, or any organized physical activity program when you leave BELT? If so, which one (specifically the name and address, proximity to your home)? How will you use that gym or club?
2. How will you obtain the recommended 150-minutes of cardiorespiratory physical activity each week (e.g., before or after work? On weekends?)
3. How will you maintain or improve your muscular strength? Will you include flexibility and neuromotor activities? What type of regimen will you follow specifically?
4. In which sport or activities do you expect to participate regularly (e.g., tennis, golf, dance, basketball, running, bowling, biking, group fitness classes)? What are your specific plans about those activities (i.e. with whom will you participate, when, for how long)?
5. What kind of plan will you put in place for potential barriers that may get in the way of being physically active? What alternative ideas do you have for staying physically active when barriers arise?
6. What sources of support can you identify to help you throughout this process?

## Exercise Tips

The American College of Sports Medicine (ACSM) recommendations for healthy adults (from ACSM.org):

### Cardiorespiratory Exercise

- Adults should get at least 150 minutes, **and up to 300 minutes**, of moderate-intensity exercise per week.
- Exercise recommendations can be met through 30-60 minutes of moderate-intensity exercise (five days per week) or 20-60 minutes of vigorous-intensity exercise (three days per week).
- One continuous session and multiple shorter sessions (of at least 10 minutes) are both acceptable to accumulate desired amount of daily exercise.
- Gradual progression of exercise time, frequency and intensity is recommended for best adherence and least injury risk.
- People unable to meet these minimums can still benefit from some activity.

### Resistance Exercise

- Adults should train each major muscle group two or three days each week using a variety of exercises and equipment.
- Very light or light intensity is best for older persons or previously sedentary adults starting exercise.
- Two to four sets of each exercise will help adults improve strength and power.
- For each exercise, 8-12 repetitions improve strength and power, 10-15 repetitions improve strength in middle-age and older persons starting exercise, and 15-20 repetitions improve muscular endurance.
- Adults should wait at least 48 hours between resistance training sessions.

### Flexibility Exercise

- Adults should do flexibility exercises at least two or three days each week to improve range of motion.
- Each stretch should be held for 10-30 seconds to the point of tightness or slight discomfort.
- Repeat each stretch two to four times, accumulating 60 seconds per stretch.
- Static, dynamic, ballistic and PNF stretches are all effective.
- Flexibility exercise is most effective when the muscle is warm. Try light aerobic activity or a hot bath to warm the muscles before stretching.

### Neuromotor Exercise

- Neuromotor exercise (sometimes called “functional fitness training”) is recommended for two or three days per week.
- Exercises should involve motor skills (balance, agility, coordination and gait), proprioceptive exercise training and multifaceted activities (tai ji and yoga) to improve physical function and prevent falls in older adults.
- 20-30 minutes per day is appropriate for neuromotor exercise

## **Options for continuing programs**

1. Join UNCG's HOPE (Helping Others Participate in Exercise) program
  - Current cost - \$140 per semester
  - Benefits:
    - continued program at UNCG with familiar faces
    - tailored to participants
    - affordable
  - Challenges:
    - limited facility availability (MWF mornings, 6:00-8:30 AM)
  
2. Get a gym membership (many options locally)
  - Cost - Varies (fairly inexpensive for some memberships to fairly expensive for upper-end facilities or one-on-one training)
  - Benefits:
    - facilities have many options for working out
    - possibility of group classes, access to personal trainers, etc.
  - Challenges:
    - anonymity
    - crowded at certain times
    - cost
    - expertise of staff varies among facilities
    - lack of accountability (will vary among facilities and programs)
  
3. Monitor your own program
  - Cost - Free
  - Benefits:
    - total control over your own program
    - flexibility
  - Challenges
    - total control over your own program
    - flexibility
    - lack of accountability

## STRESS MANAGEMENT HANDOUT

### Progressive Muscle Relaxation

Edmund Jacobson (1929) developed this technique. It consists of a series of exercises that involve tensing muscle groups and then relaxing them. By first tensing a muscle, it is much easier to "let it go" and relax it. With your muscles becoming more and more relaxed, it is easier for you to calm down and be in control of your behavior.

Sit in a comfortable chair in a quiet room with low light. Close your eyes and then focus your attention on various muscle groups - alternating with tension and relaxation. Settle back in the chair, take a deep breath, let it out slowly, close your eyes and make your mind a complete blank. Extend your arms directly in front of you, clench your fists and tighten all the muscles in your arms. Tense your muscles about 3/4 of the maximum that you could tighten them. This is enough to feel quite a bit of tension without risking injury. Hold this for five seconds, then say "Relax," as you let your arms slide to the arms of the chair and relax. Focus on the immediate contrast between the tension that was in your arms and the developing relaxation. Let your arms and hands relax for 30 - 60 seconds. During this time, you might notice the relaxation developing and how your hands and arms feel different from the rest of your body. Repeat this procedure for a second time, tensing for five seconds and relaxing for 30 - 60 seconds.

Follow the same procedure for other muscle groups:

**Face.** Squint your eyes, crease your forehead, and clench your teeth together. Hold the tension for five seconds, then "Relax." Notice the relaxation develop over your face. Keep relaxing for 30 - 60 seconds. Then repeat the procedure.

**Upper trunk.** Take a deep breath, shrug your shoulders, tense the muscles in your chest, neck, and back. Hold the tension for five seconds, then "Relax." Notice the relaxation develop over your upper trunk. Keep relaxing for 30 - 60 seconds. Then repeat the procedure.

**Lower trunk and legs:** Lift your legs five inches off the floor, tighten your stomach and buttocks, and all the muscles in your legs. Hold the tension for five seconds, then "Relax." Notice the relaxation develop over your lower trunk and legs. Keep relaxing for 30 - 60 seconds. Then, repeat the procedure.

After you have practiced this routine several times in a relaxed environment, you will notice that it will become easier and easier to become totally relaxed in shorter and shorter periods of time. When you are able to relax yourself in a reasonably short period of time (three minutes or less), you are ready to begin using relaxation as a tool to combat periods of tension and stress. When you notice the tension and stress building, consider it a signal to focus in on the feelings of tension in your body. Quickly tense your muscles, let it go and then relax. Practice makes perfect!

## Stress Shape Buster

Life experiences  
that have strengthened me  
and taught me to manage:

My support networks,  
people who nurture and  
console me:

Attitudes/Beliefs  
that protect me or help me  
view life differently:

Physical self-care habits  
that prepare me or help me  
release tension:

Action skills I can use to  
change or manage the  
situation:

## Behavioral Commitment Form

**GOAL:**

**Behavioral  
Objectives:**

**Time Frame:**

**Rewards for  
achieving  
goal:**

**Goal  
Supporting  
Activities:  
Potential  
Barriers:**

**Participant:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**FLOW consultant:** \_\_\_\_\_

**Date:** \_\_\_\_\_



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APPENDIX D  
EMAIL TEMPLATES

**Sample Session Preview Email**

Good morning!

I hope this finds you well. Just a quick reminder that we have BELT tomorrow morning and you will be completing your first educational session, which is goal setting. I have attached the two documents that will be reviewed in the session tomorrow for your convenience. Come with any questions you may have. A short evaluation of the session will be sent to you via email after tomorrow's session that we ask you to complete at your earliest convenience. Looking forward to seeing you tomorrow!

Cheers to health!

Sara

.....

**Sample Session Assessment Email**

Hello \_\_\_\_\_,

Thank you for a great session this morning! As promised, here is the link to the short evaluation of the session. If you could please fill it out at your earliest convenience, I would greatly appreciate it!

[https://uncg.qualtrics.com/SE/?SID=SV\\_5anq3zOb0AkTsix](https://uncg.qualtrics.com/SE/?SID=SV_5anq3zOb0AkTsix)

You are working hard and I am proud of you! Keep believing in yourself and you will be amazed at what you can accomplish! Remember to think positive thoughts and that you are beautiful in every single way.

Cheera to health!

Sara

.....

**FLOW Program Assessment Email**

Hi \_\_\_\_\_,

It’s hard to believe how fast this 16 weeks has flown by! Thank you so much for your hard work and diligent participation in the FLOW Program! It is my hope that you will carry these skills with you and that they will be useful on your wellness journey moving forward. If you could please complete the following assessment of the FLOW program I would greatly appreciate it:

[https://uncg.qualtrics.com/SE/?SID=SV\\_72Sm10BxMUHYXKI](https://uncg.qualtrics.com/SE/?SID=SV_72Sm10BxMUHYXKI)

Additionally, it is time for us to schedule the interview. This project is examining participants’ perceptions of the FLOW (*Following a Lifestyle of Wellness*) psychological skills intervention as a part of the BELT program, along with what changes participants experience over the course of the program session. You are being asked to participate in this project. Your participation in this study will contribute to part of the completion of this project, as your interview will be compiled with other interviews to serve as the prominent data for this research inquiry. Although there will be no benefit to you personally from participating in this study, the evaluation of FLOW will contribute to our knowledge of exercise participation strategies. The interview will take approximately 45-60 minutes to complete and will be conducted via telephone.

If you could please let me know three different dates and times that you are available for this interview in the next week, along with a reliable contact number where you can be reached, I would greatly appreciate it. Dr. Kym Fasczewski, assistant professor in Kinesiology at Appalachian State University, will be conducting the interview. I will put you in contact with her once the interview time has been set.

Again, thank you for your participation in this program and always remember as Carl Lewis said, “It’s all about the journey, not the outcome.”

Cheers to health!

Sara

.....  
**Follow-Up Survey Email**

Dear \_\_\_\_\_,

Congratulations on completing the BELT program! You should be incredibly proud of the progress you have made strengthening both your body and mind! I would

like to take this opportunity to thank you for participating in the FLOW program and my dissertation study. Your feedback is incredibly important to us and will be beneficial for improving the program moving forward.

At this time, I am completing a final follow-up to the study. If you would be willing and able to complete one final self-report questionnaire indicating your overall perceptions of the FLOW program and a few assessments of your current physical activity level and, I would greatly appreciate it. The survey will take approximately 25-30 minutes to complete.

I hope you are using the skills you have learned in the BELT program and FLOW intervention to remain physically active! As Carl Lewis said, “it’s all about the journey, not the outcome.” You have made significant changes thus far, keep moving ahead! Don’t look back, you’re not going that way. Always remember to “go with the FLOW.”

Please don’t hesitate to contact me with any questions or concerns, or if I can be of any assistance to you during this transition period.

Cheers to health!

Sara

APPENDIX E

BASELINE CHARACTERISTICS OF ALL PARTICIPANTS

*Table 6. Baseline Characteristics of All Participants*

|   | <b>Completed<br/>n = 11</b> | <b>Dropout<br/>n = 7</b> |
|---|-----------------------------|--------------------------|
| Age in years                            | 45.1 (± 9.6)                | 47.6 (± 7.9)             |
| Ethnicity                               |                             |                          |
| White                                   | 8 (73%)                     | 3 (43%)                  |
| African-American                        | 3 (27%)                     | 4 (57%)                  |
| Education                               |                             |                          |
| Trade/Technical School                  | 3 (27%)                     | 2 (29%)                  |
| Associates Degree                       | 1 (9%)                      |                          |
| Bachelor's Degree                       | 1 (9%)                      | 1 (14%)                  |
| Master's Degree                         | 4 (36%)                     | 3 (43%)                  |
| Professional Degree                     | 2 (18%)                     | 1 (14%)                  |
| Obesity Related Comorbidities           |                             |                          |
| Arthritis                               | 2 (18%)                     | 3 (43%)                  |
| Sleep apnea                             | 3 (27%)                     | 4 (57%)                  |
| High blood pressure                     | 3 (27%)                     | 1 (14%)                  |
| Type-II diabetes                        | 1 (9%)                      | 2 (29%)                  |
| Fatty liver syndrome                    | 2 (18%)                     |                          |
| High Cholesterol                        |                             | 3 (43%)                  |
| Congestive Heart Failure                |                             | 1 (14%)                  |
| Gall bladder disease                    | 1 (9%)                      |                          |
| Depression                              | 1 (9%)                      | 1 (14%)                  |
| Psychological distress                  | 1 (9%)                      |                          |
| No reported conditions                  | 6 (55%)                     | 1 (14%)                  |
| Bariatric Surgery Type                  |                             |                          |
| Roux-n-Y Gastric Bypass                 | 2 (18%)                     | 2 (29%)                  |
| Laparoscopic Adjustable Gastric Banding | 2 (18%)                     |                          |
| Vertical Sleeve Gastrectomy             | 7 (64%)                     | 5 (71%)                  |
| IPAQ – sitting time                     |                             |                          |
| Weekday hours                           | 6.6 ± 3.2                   | 6.3 ± 1.5                |
| Weekend hours                           | 4.8 ± 2.9                   | 5.3 ± 1.4                |
| SEE Total                               | 40.3 ± 18.6                 | 39.4 ± 13.4              |
| SPAS-7 Total                            | 20.2 ± 6.5                  | 14 ± 5.7                 |

## APPENDIX F

### SUMMARY OF OPEN-ENDED RESPONSES

#### **Specific Intervention Evaluation Comments: Praise or Improvement**

##### **Goal Setting**

*First of all, I think it is great to be able to talk about what your goals are. The only suggestion I have is for the goals we set to really talk about how we are going to get there and establish a timeline. This will help us fill out the goal worksheet and use it to track our progress.*

*I think having a one-on-one other than while I'm on the treadmill would have been more beneficial. :-)*

*The accountability mainly. But the information was very helpful.*

*I know we should have our own goals but I felt like you should have certain goals for the Belt Program that we should meet also.*

##### **Self-Confidence**

*I really appreciate the support this program provides. Thanks!*

*I feel like when someone starts out with low self-confidence and no goals it takes a lot of work to try and get them to change the way they feel about themselves. I thought I looked pretty bad when I was heavier but now that I have lost some weight I think I look bad due to the hanging skin. I was told this morning there is no such thing as toning of the body you just build muscle. If that's the case I have a lot of muscle building to do to help fill up the loose skin.*

##### **Body Image Perceptions**

*Great session -- the support is greatly appreciated.*

*I feel like I did most of the talking and didn't give Sara a chance to go through her presentation. :) However, our discussion was most helpful to me, especially at this stage of my weight loss.*

*When someone has negative thoughts about the way they look it takes a little while to get them to think positive about the way their body looks*

## **Exit Strategies**

*It really makes you think about your options and what will work best for you and your situation.*

## **Stress Management**

*Great feedback; enjoyed learning more about effectively managing my stress levels.*

## **Behavioral Commitment**

*Sometime it is very hard to do 2 things at once I think sometimes it would be better to actually take a moment and discuss things other than while we are working out.*

## **What was the reason why your top three sessions were so helpful?**

*Areas in which I need the most help/had the most difficulty maintaining (Noted by 3 participants)*

*Actually, all of the sessions were helpful but I chose these top three because they are what I need most. Setting goals keeps me focused. Body Image Perceptions was helpful because right now I am 20lbs heavier due to surgery and I am having a tough time losing the extra weight. I do not feel good about myself and my clothes do not fit. Sara helped me to see that I am much more than my physique. And, lastly, stress management. I am making sure to take time to care for myself and do things that promote relaxation. You have to set goals. Gain confidence Deal with stress*

*Everyone needs to have the self confidence built, When you are working a program you need to know what your game plan is when the program is over. Everyone needs to know how to manage their stress*

*I liked the goal-setting session because it taught me how to set specific goals. Found the SMART acronym to be very helpful. Body image is a huge struggle of mine, so I liked this session a lot. I'm my own worst critic and it helped me focus on what my body can do now, how much I've "gained" since surgery. The coping skills session was great because it helps a control freak like me learn to not be so hard on myself, no one is perfect. Loved the quote about learning to dance in the rain. Life happens, things get crazy quickly, it's nice to have coping skills to deal with whatever life throws at me.*

### **Overall Program Comments: Praise or Improvement**

*The FLOW program was very helpful and I have no suggestions for improvement.*

*The great interaction, face to face.*

*It kind of makes it hard to concentrate and participate while working out.*