

**BARIATRIC PROGRAM EVALUATION**

**BY  
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### **Abstract**

Obesity is on the rise in the United States. The traditional treatment of diet and exercise has been ineffective with weight loss and weight maintenance; therefore, the medical community and obese individuals are looking at bariatric surgery for a more effective treatment. Health educators and bariatric programs want clients to succeed with their weight loss and use surgery as a tool and not as a cure for obesity. It is speculated that the use of health education strategies and behavior change theories would provide the client with the best chance for long-term success. This study reviewed bariatric programs via the web sites for program information to determine if there was an integration of health education strategies and behavior change theories among programs. The theories included in this study were the Health Belief Model, Transtheoretical Model, Social Cognitive Theory and Self-Efficacy. Univariate analysis was used to assess study results. The study demonstrated that bariatric programs most often used the health education strategies of orientation/informational session (68%, n=13) and support groups (53%, n=10) for educating clients. Results also indicated that the health belief model was the behavior change model most often identified in bariatric programs. The health belief model was identified in 90% (n=17) of the bariatric programs reviewed. Decisional balance from the transtheoretical model was well integrated into the bariatric programs with 90% (n=17) of the programs using this construct. The social cognitive theory and self-efficacy were not well integrated due to needing direct access to the bariatric programs and clients. Future research still needs to address whether or not health education strategies and behavior change theories are beneficial to bariatric program development and do they help to define a quality bariatric program?

### **Research Question**

Obesity is a major health concern in the United States today. The incidence of obesity is growing at a rapid rate and the traditional methods of weight management are not effective. Bariatric surgery is becoming increasingly popular as a treatment option for obesity. As a result many hospital systems and surgeons are developing bariatric surgery programs at a rapid rate to meet the demand. Programs can differ in services provided to the consumer ranging from a comprehensive program to one that just provides surgery. With 20 to 25 percent of bariatric surgeries being unsuccessful due to dietary non-compliance (Shikora, 2000) we need to explore what will insure greater success. Are the current bariatric programs using an integration of health education strategies and behavior change theories? If they are using strategies and behavior change theories, to what extent are the programs using them? If health education strategies and behavior change theories are not being used or are limited in use, what strategies and theories would be beneficial to the current programs and the development of future programs?

## Literature Review

### Obesity as a Problem

Obesity is epidemic in the United States and is threatening the health of millions of Americans. According to the National Institutes of Health (NIH) and the National Heart, Lung, and Blood Institute (NHLBI) and the National Institute of Diabetes and Digestive and Kidney Disease (NIDDK) in June of 1998, 55 percent (97 million) of the adult population are medically overweight. Of those overweight individuals, 33 percent (approximately 65 million) are considered obese and one third of obese adults (22 million) are dangerously overweight (NIH, NHLBI, & NIDDK, 1998). The causes of obesity are complex and involve social, behavioral, cultural, physiological, metabolic, and genetic factors.

Obesity is a major contributor to preventable death and disease in the United States. Individuals are spending billions of dollars each year in direct costs of health related illnesses of obesity such as hypertension, type 2 diabetes, heart and vascular disease, stroke, gallbladder disease, sleep apnea, osteoarthritis, some cancers and depression. The treatment of these weight driven diseases accounts for 1/16 of the healthcare budget (Novartis Nutrition, 2000). Each moderately overweight individual costs the healthcare system \$88 per year and each obese individual costs \$212 yearly (Novartis Nutrition, 2000). Obesity drains another \$100 billion from the economy each year in the form of decreased productivity, missed days at work, and premature death (Novartis Nutrition, 2000). Americans are willing to spend large amounts of money, to the tune of \$50 billion, on weight loss programs and slimming aids, such as diet sodas and health spa memberships (Wadden, Foster, Letizia, & Stunkard, 1992).



In the past decade bariatric surgery has grown in popularity. Obese individuals believe that they are at a desperate stage in life, having endured discrimination, suffering from medical problems, and having been unsuccessful at numerous weight loss attempts. They approach bariatric surgery as a last desperate attempt to lose weight despite the surgical risks. Bariatric surgery has been shown to be a more effective treatment than the traditional non-surgical methods for inducing and maintaining a satisfactory weight loss of at least 50 percent of the excess body weight (Balsiger, Murr, Poggio, & Sarr, 2000). Bariatric surgery has assisted individuals in achieving a weight loss at which many or most weight-related co-morbidities are reversed or markedly ameliorated (Balsiger, et al., 2000).

### **Definition of Overweight and Obesity**

Before discussing the non-surgical and surgical methods of weight loss, it is important to define what is meant by overweight and obesity. Overweight and obesity are classified by using the Body Mass Index (BMI), waist circumference, and associated disease risk (see Appendix 1). The BMI describes relative weight for height and is significantly correlated with total body fat content (see Appendix 2) (NIH, NHLBI, & North American Association for the Study of Obesity (NAASO), 2000). Being overweight is defined as having a BMI of 25-29.9 kilograms/meter<sup>2</sup> (kg/m<sup>2</sup>), and having obesity is defined as having a BMI  $\geq 30$  kg/m<sup>2</sup> (NIH, NHLBI, & NAASO, 2000). For persons with a BMI  $\geq 30$ , mortality rates from all causes, especially cardiovascular disease, are increased by 50 to 100 percent above those with BMIs in the range of 20-25 (NIH, NHLBI, & NAASO, 2000). A BMI of 30 indicates an individual is about 30 pounds overweight. An individual with a BMI of 40 is equivalent to being approximately

100 pounds overweight. A BMI of 40 is considered extreme obesity (NIH, 1991).

Individuals at the highest risk of morbidity and mortality can be classified as having “morbid obesity” or the preferred term “clinically severe obesity” (NIH, 1991). Those categorized with “clinically severe obesity” are potential candidates for surgical treatment.

## **Treatment of Obesity**

### **Non-Surgical Treatment**

There are two approaches to weight management, the non-surgical and the surgical approach. The treatment recommendation should be based on the individual’s degree of obesity and their level of health risk. It is recommended that all obese individuals should undergo basic treatment for obesity, regardless of other concurrent therapy (American Association of Clinical Endocrinologists & American College of Endocrinology, 1997). There are different for treatment options for weight reduction based on health risk (see Appendix 3). Basic treatment is a non-surgical approach and should be the first line of therapy. This consists of the conventional methods of low calorie diets combined with exercise and behavior modification. Pharmacological treatment may also be used at this time. This type of treatment can occur through commercial weight loss programs or individuals may attempt it on their own. It has been well documented that the non-invasive strategies for sustained weight loss are often inadequate for many obese individuals. The amount of weight loss is either insufficient or there is a high likelihood of relapse. Like other chronic conditions, only permanent interventions are likely to yield long-term results. This concept highlights the philosophy behind a surgical treatment approach.

## **Surgical Treatment**

The goal of surgical treatment is to induce and maintain permanent loss of at least half of the pre-surgical excess body weight. There are two main categories that the surgical procedures fall into: malabsorptive and gastric restriction. Some procedures will use the combination of the two. The surgery of choice is the gastric bypass procedure, also known as the Roux-en Y. It is the combination of gastric restriction and malabsorption. The Roux-en Y separates the top of the stomach from the remainder of the stomach. The approximate size is that of a golf ball holding approximately 1 ½ to 3 ounces of volume (restricting the volume ingested). The top part of the stomach is connected to jejunum (the second portion of the small intestine), bypassing most of the stomach (which had functioned as a reservoir for large meals) and all the duodenum (Shikora, 2000). The literature shows this procedure to be more effective in inducing and maintaining a satisfactory weight loss of at least 50 to 80 percent of excess body weight (Balsiger, et al., 2000; & NAASO, 1999). Of even more importance are the effects of the weight loss on the associated weight related co-morbidities. Potential candidates must meet the criteria developed by The National Institutes of Health (NIH) Consensus Development Conference of 1991, this includes: BMI of 40 or greater (100 pounds overweight) or BMI of 35 and greater in combination with life-threatening co-morbidities.

## **Behavior Modification**

Bariatric surgery may be a radical treatment for the clinically severe obese. It has proven to be the most effective treatment at inducing and maintaining a satisfactory weight loss. Success of the surgery is not just the weight loss but more significantly is

the ability to sustain the loss over time. Long-term success requires more than a good procedure. It also requires a programmatic effort to provide ongoing medical follow-up and behavior modification through ongoing assessment and education by a multi-disciplinary team (Shikora, 2000). Behavior modification is essential for long-term success. Bariatric programs that can provide these services will succeed at maintaining very good long-term results (Shikora, 2000).

Behavior change is a complex process, often difficult to achieve and sustain. Health professionals realize they are competing against powerful forces to encourage healthy behaviors. These forces involve social, psychological, and environmental conditioning. The benefits of behavior change must be compelling. There are many different theories and models used for understanding behavior change and designing successful interventions.

### **Why use Behavior Change Theories**

Theory is important to health education and promotion because it helps the planners with the various stages of a health education program. The various stages include program development, implementation, and evaluation of interventions.

Theories are used in program development because they help planners understand the nature of targeted health behaviors. It explains the dynamics of behavior, the processes for changing behavior, and the effects of external influences on behavior. Theories can help identify the most suitable targets for programs, the methods for accomplishing change, and outcomes for evaluation (National Cancer Institute [NCI] & National Institutes of Health [NIH], 1997).

In addition, theory assists health educators in professional decision making, strengthening program justification, promoting the effective and efficient use of resources, and improving accountability. Theory also assists in establishing professional credibility (McKenzie & Smeltzer, 2001). Without the direction that theories provide, planners can easily waste valuable resources in trying to achieve the desired behavior change (McKenzie & Smeltzer, 2001).

Theory also helps us to think of ideas we might not have considered. When looking at multiple theories, it helps to keep our minds open and disciplined, resulting in more effective programs. While theory alone does not produce effective programs, theory-based planning, implementation, and monitoring does (NCI & NIH, 1997).

No single theory dominates behavior change research or practice. Different theories are dependent on behaviors you want to change. Health behavior and its guiding concepts are far too complex to be explained by a single theory. Effective health education depends on the most appropriate theory and practice strategies for a given situation (Glanz, et al, 1990).

For the purpose of this study, the Health Belief Model, the Transtheoretical Model, and the Social Cognitive Theory will be discussed with special attention to the construct of self-efficacy. The models and theory chosen represent the best known and most often used models for behavior change. Some models and theories work better in certain situations depending on which level of influence the program wants to target. The transtheoretical model and health belief model influence the individual at the intrapersonal level. These theories address personal beliefs and attitudes toward health and behavior change (McKenzie & Smeltzer, 2001). The social cognitive theory is an

approach used at the interpersonal level allowing social support networks of family and friends to help, encourage, and motivate the individual in making the necessary behavior change (McKenzie & Smeltzer, 2001). The next section of the paper will provide the reader a detailed discussion of the behavior change theories used for this study.

## **Behavior Change Theories**

### **Health Belief Model**

The health belief model is one of the best-known and frequently used models in health behavior applications. It was originally developed as a systematic method to explain and predict preventive health behavior. It focuses on the relationship among health behaviors, practices, and utilization of health services. The health belief model has been applied to the study of all types of health behavior, including:

- Health screening behaviors such as mammography, skin testing for tuberculosis and prostate screening (Brown, 1999).
- Prevention action behaviors such as low fat diet, exercise, use of condoms, vaccinations, breast self-exam, and dental check-ups (Brown, 1999).
- Illness behaviors are actions taken by an individual in response to specific signs and symptoms aimed at clarifying their health status, such as talking to family and friends, going to the doctors, reading about different illnesses, and waiting for things to get better (University of Western Australia, 2000).
- Sick role behavior is socially and culturally defined and follows from the individual's ability to carry out satisfactorily his/her normal roles in society. This behavior consists of actions taken by the person who has been labeled ill and aimed at restoring or improving their health status, e.g., taking medication,

entering the hospital, undergoing surgery, and complying with a prescribed medical regimen (University of Western Australia, 2000).

There are five major components to the health belief model:

- **Perceived Susceptibility** is a person's perceived risk of developing a serious health condition or sequelae of that illness or condition.
- **Perceived Severity/Threat** is a person's belief that one is vulnerable to contracting a health condition and knows that it can be very serious.
- **Perceived Benefits** produces a course of action dependent on the beliefs regarding the effectiveness of the various actions in decreasing the threat of disease. The action is usually perceived as feasible and efficacious.
- **Perceived Barriers** are potential negative aspects of a particular health action. This usually occurs when an individual weighs an action's effectiveness against perceptions that it maybe expensive, dangerous, unpleasant, inconvenient and so forth.
- **Self-Efficacy** is the conviction that one can successfully execute the behavior required to produce the outcomes. Bandura introduced this concept in 1977 and was added to the health belief model to increase its explanatory power. This construct will be discussed as a separate entity later in this paper.

(Rosenstock, 1990)

The application of the health belief model involves the incentive to take action, to provide a clear course of action to acceptable cost, and to enhance the feeling of competency to take action (Brown, 1999).

### **Application of the Health Belief Model**

The health belief model has not been widely used to address weight management interventions in adults. There have been studies conducted using the health belief model with adolescents and weight management interventions. Many of the studies using the health belief model dealt with screening behaviors and prevention behaviors such as condom use for prevention of sexually transmitted diseases and pregnancy. More studies on the Health Belief Model and weight management in adults need to be done.

In a study by O'Connell, Price, Roberts, Jurs, & McKinley (1985), the focus was on utilizing the health belief model to predict dieting and exercising behavior of obese and non-obese adolescents. A questionnaire was utilized to determine the most important beliefs about dieting, exercising, and obesity for each of the four major components of the health belief model. O'Connell, et al (1985) found that benefits of dieting was the most powerful predictor of dieting behavior for the obese adolescents and susceptibility to the causes of obesity best explained present dieting behavior of non-obese adolescents. Exercising behavior of obese teenagers was best explained by cues to exercising.

### **The Transtheoretical Model**

The transtheoretical model is an integrative framework for how individuals progress toward adopting and maintaining health behavior change for good health. The transtheoretical model uses the stages of change process and principles of change from other major theories of interventions (McKenzie & Smeltzer, 2001). This model has been applied to many types of health behavior change including substance abuse, smoking cessation, weight loss, exercise, and others where a health behavior change was needed.

The transtheoretical model has five core constructs that include the stages of change, the processes of change, the pros and cons of changing, self-efficacy, and temptation (McKenzie & Smeltzer, 2001). The first is the "stage" construct. It suggests that individuals changing behaviors move through five stages. They are:

- **Precontemplation** is defined as no intention to changing behavior in the next six months.
- **Contemplation** is when the person is aware that a problem exists and is seriously thinking about a behavior change within the next six months but has not yet committed to taking action.



- **Preparation** combines intention and behavioral criteria. Usually a person is intending to take action in the next month and has unsuccessfully taken action with the past year.
- **Action** is when the individual is modifying their behavior, experiences, or environment in order to overcome their problems. Action involves the most overt behavioral changes and requires considerable commitment of time and energy.
- **Maintenance** the individual is working to prevent relapse and has changed their problem behavior for at least six months and are increasingly more confident that they can continue.

(Prochaska, Di Clemente, & Norcross, 1992)

The second major construct of the transtheoretical model is the processes of change. “These change processes are covert and overt activities and experiences that individuals engage in when they attempt to modify problem behaviors (Prochaska, et al, 1992). Each process is a broad category encompassing multiple techniques, methods, and interventions traditionally associated with desperate theoretical orientations.

- **Consciousness Raising:** Finding and learning new facts, ideas, and tips that support the healthy behavior change.
- **Dramatic Relief:** Experiencing the negative emotions (fear, anxiety, worry that go with unhealthy behavioral risks.
- **Self-Reevaluation:** Assessing how one feels about oneself with respect to a problem. Realizing that the behavior change is an important part of one’s identity as a person.
- **Environmental Reevaluation:** Realizing the negative impact of the unhealthy behavior, or the positive impact of the healthy behavior, on one’s proximal social and /or physical environment.
- **Self-Liberation:** Making a firm commitment to change.
- **Helping Relationships:** Seeking and using social support for the healthy behavior change.
- **Counterconditioning:** Substitution of healthier alternative behaviors and/or cognitions for the unhealthy behavior.
- **Reinforcement Management:** Increasing the rewards for the positive behavior change and/or decreasing the rewards of the unhealthy behavior
- **Stimulus Control:** Removing reminders or cues to engage in the unhealthy behavior and /or adding cues to reminders to engage in the healthy behavior.
- **Social Liberation:** Realizing that social norms are changing in the direction of supporting the healthy behavior change.

(McKenzie & Smeltzer, 2001)

Over the years studies have indicated that some processes are more useful at specific times. To increase intention and motivation, the experimental set of processes of consciousness raising, dramatic relief, self-reevaluation, environmental reevaluation, and social liberation are most often emphasized in the first three stages (precontemplation, contemplation, and preparation). While the other processes are used in the action and maintenance stage as behavior change efforts are being made and maintained (McKenzie & Smeltzer, 2001).

The transtheoretical model construct of pros and cons (also known as decisional balance) was integrated into this model based on the original work of Janis and Mann (Ruggiero, 2000). This is the individual's decision to move from one stage to the next based on the comparative importance or benefits of changing behavior against the lack of importance or the costs of changing behavior (McKenzie & Smeltzer, 2001).

The last two core constructs are self-efficacy and temptation. Self-efficacy is defined as a person's confidence in their ability to perform a certain desired task or function. Temptation is making behavior change to engage in unhealthy behaviors. This will decrease as an individual proceeds through the different stages (McKenzie & Smeltzer, 2001).

The transtheoretical model assists program planners in becoming aware that individuals will proceed through the changes at varying paces. This model will also assist in developing programs to help individuals get ready for action.

### **Application of the Transtheoretical Model**

The transtheoretical model is a promising approach to conceptualizing and treating eating patterns. It attempts to isolate and describe basic elements in the process

of behavior change. This model is diverse and comprehensive enough to incorporate the multidimensional issues of obesity (Suris, Trapp, DiClemente, & Cousins, 1998). A study conducted in 1998 by Suris, et al. focused on whether aspects of the transtheoretical model can be successfully applied to understanding obesity treatment among Mexican American women. The women were recruited from a larger study that was conducted to evaluate the effectiveness of promoting weight loss by modifying their dietary and physical activity patterns. The approach used by Suris, et al (1998) for obesity treatment included behavior modification, information about nutrition and exercise, lifestyle change, and family involvement. A questionnaire that measures involvement in the tasks of the various stages of change and the processes was used. It was thought that various cultures may use different processes of change more than others, and some processes may be more readily accepted by cultures while others are more problematic. Suris, et al (1998) reported an average amount of process usage on each of the processes, while consciousness raising and social liberation being more highly endorsed at the baseline. The results were in the predicted direction with significant correlation found among the behaviorally based processes (i.e. self-liberation, helping relationships, counter-conditioning, reinforcement management and stimulus control).

A second study conducted by Prochaska, Norcross, Fowler, Folleck, and Abrams in 1992, emphasizes the dynamic processes and stages as core dimensions for understanding how people change. The participants were assessed on processes and stages of change, self-efficacy, social support, weight history and demographics at the beginning, middle, and end of a ten-week, behaviorally oriented work-site program for weight control. The participants progressed from being initially more in the

contemplation stage to being more in the action stage. Clients reported significantly greater use of the processes, specifically counter conditioning, stimulus control and social liberation by mid-treatment. Based on data from the study, Prochaska, et al (1992) found that it is necessary to pay more attention to the change processes being used during the first few weeks to enhance the efficacy of the interventions used. The study also supported the contention that participants who moved from the contemplation stage to the action stage had increased levels of self-efficacy. Another significant finding was that when participants are more committed to the action stage, the more treatment sessions they are likely to attend and the more weight they are likely to lose by the end of treatment.

### **Social Cognitive Theory**

The social learning theory was renamed the social cognitive theory in 1986 by Albert Bandura. It combines the stimulus response theory with cognitive theories. The social cognitive theory helps one to understand the complex relationships between the individual and his or her environment, how actions, and conditions reinforce or discourage change and the importance of believing in and knowing how to change.

There are a number of constructs that explain the health education process. They include:

- **Reinforcement** is believed to be an integral part of the learning process, along with the individual's expectations of outcomes that increase the chance of reoccurrence. There are 3 ways for reinforcement to be accomplished; 1) direct reinforcement; 2) vicarious reinforcement—the observation of another being reinforced for an appropriate behavior; 3) self-management—when appropriate behavior is performed, the individual reinforces or self-rewards themselves.
- **Behavior Capability**—for a change to take place, one must learn what to do and how to do it.
- **Expectations**—beliefs about the likely outcomes of certain behaviors—expect certain things to happen in certain situations.
- **Expectancies**—the value one places on the expected result.

- **Reciprocal Determinism**—the dynamic relationships between the individual and the environment.
- **Self Control / Self-Regulation**—control of one's behavior through monitor and adjustments.
- **Self-Efficacy**—the belief in one's ability to successfully change one's behavior.
- **Emotional-Coping Response**—for learning to occur, a person must be able to handle the anxieties associated with the behavior.

(McKenzie & Smeltzer, 2001)

### **Application of the Social Cognitive Theory**

The social cognitive theory has been use to study a wide range of health problems. Foreyt and Poston (1998) reviewed the role of cognitive behavior therapy in obesity treatment. Cognitive behavior therapy uses the principles of the social cognitive theory to modify the behaviors that are thought to contribute and or maintain obesity.

Most comprehensive weight programs use five strategies:

1. Self-monitoring and goal setting
2. Stimulus control for modification of eating styles, activity, and related habits
3. Cognitive restructuring techniques that focus on challenging and modifying unrealistic thoughts or expectations
4. Stress management
5. Social support

These strategies have been useful in comprehensive obesity treatment programs for short-term weight loss but not so with long-term weight maintenance (Foreyt & Poston, 1998). More long-term success interventions will need to focus on broader treatment outcomes, such as improved metabolic profiles, quality of life, psychological functioning and physical fitness (Foreyt & Poston, 1998).

### **Self-Efficacy**

Self-efficacy is a relative newcomer to behavior change research. Bandura introduced self-efficacy as a construct of the Social Cognitive Theory in 1977. It has since been incorporated as a construct in the Health Belief Model and the

Transtheoretical Model. Bandura and colleagues proposed that one aspect of the notion of self, self-efficacy, is the most important prerequisite for behavior change (Perry, Baranowski, & Parcel, 1990). Self-efficacy refers to the internal state that individuals experience as “competence to perform certain tasks or behavior (McKenzie & Smeltzer, 2000). Efficacy expectations determine the choices people make, how much effort people will expend, how long they will persist in the face of obstacles and aversive experience, and the degree of anxiety or confidence they bring to the task at hand (Bandura, 1977). The stronger the perceived self-efficacy, the more active the efforts. The conceptual status of the self-efficacy construct is controversial (Stotland & Zuroff, 1991) but measures of self-efficacy have been found to be predictive of change in many types of behaviors, including stress reactions, self-regulation of addictive behaviors, and career choice and development (Skelly, Marshall, Haughey, Davis, & Dunford, 1995). Individuals may perform better when they feel they are capable of doing well.

According to the literature, individuals become self-efficacious in four ways:

- ***Performance Accomplishments***—personal mastery of a task. The most influential source.
- ***Vicarious Experience***—observation of someone else being reinforced for behaving in an appropriate manner. This is “If he can do it, I can do it.”
- ***Verbal Persuasion***—receiving suggestions/feedback from others.
- ***Emotional Arousal***—interpreting one’s emotional state.

(Bandura, 1977 & McKenzie & Smeltzer, 2000).

### **Dieting Self-Efficacy**

Based on Bandura’s construct of self-efficacy, one can then define dieting self-efficacy. This is the belief a person has in his or her own ability to diet successfully (Stotland & Zuroff, 1991). It refers to the beliefs in one’s ability to remain on one’s diet

in particular eating situations, to adhere to specific dieting behaviors, and to achieve dieting goals. These three types of beliefs can be termed and defined as:

- ***Situation Based Dieting Self-Efficacy*** is an individuals in their ability to adhere to the diet in various situations
- ***Behavior Based Dieting Self-Efficacy*** is an individuals beliefs about their own ability to perform various behaviors thought to be important components of behavioral treatment programs for obesity
- ***Goal Based Dieting Self-Efficacy*** is an individuals belief in their ability to attain treatment goals

(Stotland & Zuroff, 1991)

Dieting self-efficacy can be used to examine an individual's characteristics that are predictive of weight loss success and weight maintenance. Its predictive value can be used in the development of effective treatment methods and offer treatment to those likely to benefit. Dieting self-efficacy can also direct research aimed at the development of more broadly successful treatment approaches.

### **Application of Self-Efficacy and Dieting Self-Efficacy**

There has been limited research regarding the predictive values and changes in self-efficacy following obesity treatment. How self-efficacy impacts obesity treatment is unclear but several studies have suggested that self-efficacy may be a useful predictor of dieting outcomes.

The utility and validity of Bandura's theory of self-efficacy, in the context of a weight reduction program, was tested by Bernier and Avard (1986). It was hypothesized there would be a significant relationship between weight loss and self-efficacy increments, and that the level of personal self-efficacy would be a significant predictor of weight loss during treatment and follow-up. It was also hypothesized that self-efficacy would be related to attrition during treatment and follow-up. Sixty-two female participants were recruited to take part in a weight reduction program. They were

randomly assigned to one of five groups and met once a week for ten weeks. Two follow-up sessions occurred at six and twenty-four weeks following the treatment program. Two questionnaire measures of self-efficacy were devised. The first was to measure the extent to which the participants felt capable of executing each of the ten cognitive-behavioral strategies in the treatment program. The second is a measure of situational self-efficacy using a ten-point scale to indicate the extent to which the participants felt capable of coping with risk situations associated with eating. Bernier & Avard (1991) demonstrated a concordance between weight loss and efficacy enhancement during follow-up periods. Self-efficacy predicted weight loss during treatment and the six-week follow-up. Also completers of the treatment program had a greater sense of self-efficacy than dropouts, especially over the pre-treatment to post-treatment interval.

The identification of individual characteristics that are predictive of outcome success in a weight control program is important. It may provide assistance with patient selection and the best treatment options for success. Stotland and Zuroff (1991) examined the relationships of multiple measures of dieting self-efficacy with weight change in a behavioral weight control program. Forty-one female participants took part in a ten-week behavioral weight control program. A series of measurement questionnaires were administered at the first treatment session, including the three dieting self-efficacy scales. Stotland and Zuroff (1991) reported the three dieting efficacy scales and residual BMI change (considered a good measure of relative weight) indicated that the goal-based scale was a significant predictor of success in losing weight. It was positively correlated with weight dissatisfaction, suggesting that goal based dieting self-



efficacy may be partially a function of the dieters' motivation to succeed. Situation based and behavior based dieting self-efficacy scales were not significant predictors of weight loss. The failure of situation based dieting self-efficacy to predict weight change highlights the issue of the relation between short- and long-term dieting successes. Situation based dieting self-efficacy's ability to predict weight loss is inconsistent. This may suggest that a "slip" in control may lead to decreased self-efficacy. Behavior based failure may have occurred because participants were to indicate confidence in performing the various behaviors in the coming week. A dieter's willingness to make immediate changes in behavior may not predict long-term adherence. It has been suggested to assess individuals several weeks into the program, when individuals are more familiar with their abilities at dieting, to be a better predictor of weight change (Stotland & Zuroff, 1991).

The benefits of using behavior change theories, especially the Health Belief Model, the Transtheoretical Model, Social Cognitive Theory, and the construct of Self-Efficacy, in the development of health education programs has been demonstrated. In the next section, strategies used in the delivery of a bariatric program are discussed. The strategies are components of the program used to strengthen its effectiveness and success.

### **Effective Health Education Strategies in Weight Management**

Good surgical results do not ensure a successful outcome. Surgery is only one aspect of comprehensive weight management. It has been documented that weight loss failures in bariatric surgery occur in twenty to twenty-five percent of patients, usually attributed to dietary non-compliance (Shikora, 2000).

### **What Can Programs do to Maximize Patients' Success?**

According to the NIH and the Institutes of Medicine, all obesity treatment programs should be multi-disciplinary and involve professionals from behavioral, nutritional, and exercise fields to facilitate the delivery of patient treatment strategies (Hunter, Larriere, Ayad, O'Leary, Griffies, DeBlanc, & Martin, 1997). The multi-disciplinary team approach has been well documented as being an integral part of weight loss and long-term weight maintenance (Smiertka & MacPherson, 1996; Shikora, 2000; DePue, Clark, Ruggiero, Mederios, & Pera, 1995; Smith & Wing, 2000; Lavery & Loewy, 1993; Blocker & Ostermann, 1996; and Balsiger, et. al., 2000). The multi-disciplinary team should include a physician, a nurse, a psychologist, a nutritionist, an exercise physiologist, and other support persons (Blocker & Ostermann, 1996; and Smiertka & MacPherson, 1996). The concept of the multi-disciplinary team also extends to bariatric surgery with the surgeon as a team member and surgery as a tool for weight loss. Other components necessary for weight loss and long-term successes are behaviors—lifestyle modification, diet and nutrition education, and exercise (Lavery & Loewy, 1993; Vansant, Hulens, Borght, Bemyttenaere, Lysens, & Nulls, 1999; and Smith & Wing, 2000). Exercise has been shown to be a major component in the prevention, treatment and maintenance of weight loss (Blocker & Ostermann, 1996; Neumark-Sztainer, Kaufmann, & Berry, 1995; and Vansant, et. al., 1999).

To promote success with bariatric surgery, careful patient selection is necessary. Patients must meet the criteria that the NIH established in 1991. Other components to promote long-term success are:

**Screening**

- Thorough medical evaluation to affirm known co-morbidities.
- Thorough psychological evaluation.
- Thorough dietary and eating history.  
(Shikora, 2000)
- Introductory educational process (Balsiger, et. al., 2000)

**Pre-Surgery—Components Identified as Critical for Good Outcome**

- The multi-disciplinary team available to individuals and their family members.
- Extensive education of the surgical process and the cooperative changes to gastric capacity and function.
- Nutrition education, dietary restrictions and potential long-term nutritional concerns.

(Shikora, 2000; and Smiertka & MacPherson, 1996)

- Weight loss program using very low calorie diets (VLCD) and a commercial product that provides high levels of protein with low levels of carbohydrates. This has not been definitively proven as a benefit but has been suggested to reduce operative risks, faster healing than those who do not lose weight prior to surgery, protein depletion did not occur, and the individual can confront behaviors that may hinder success and work on appropriate behavior modification (Martin, Tan, Holmes, Becker, Horn, & Bixler, 1995; and Balsiger, et. al., 2000).

**Post-Surgery/Long-Term Follow-Up**

- Patient compliance and outcomes are directly related to the number of post-surgery follow-up visits. These visits should address psychological issues, ongoing nutritional concerns, and screen for potential failure (Shikora, 2000).
- Access to the multi-disciplinary team is important for continued monitoring and education. The team reinforces, on a regular basis, the need for proper nutrition and exercise, and to help improve self-esteem.
- Supportive family and social structure should be promoted from the beginning of the bariatric surgical program process and continued through the post surgical phase. Family and friends should be encouraged to attend support group sessions to develop a better understanding of the surgery and post-surgical weight loss period.
- Exercise should be an issue of priority. It is important to educate the patient regarding the physical and psychological benefits of becoming physically active.  
(Smiertka & MacPherson, 1996)

## **Methodology**

### **Region of Study**

This study involved the review of bariatric surgical programs in the Midwest states of Michigan, Indiana, Illinois, Ohio, and Wisconsin. The aim of the study was to determine if health education strategies and behavior change theories were integrated into bariatric programs. Also would the integration of education strategies and behavior change models benefit bariatric program development and define a quality program. The states included in the study were chosen due to the proximity, using the University of Michigan-Flint as the base of the research project. It was assumed that most individuals would seek programs in surrounding states due to proximity of their homes, the closeness of family and support persons, and the cost related to having surgery. The study reviewed consumer available information found on the websites of various bariatric programs for components of health education strategies and behaviors change theories.

### **Web-Based Search of Available Programs to Evaluate**

A web search was initiated to look for bariatric surgery programs in the identified states. The bariatric program websites identified were reviewed to identify the components of health education strategies and behavior change theories. The review consisted of using the survey tool that was developed based on literature dealing with health education strategies and theories and personal contacts with other bariatric programs.

### **Sampling Frame**

A web search was initiated from October 2001 through November 2001. American On Line (AOL) was used to located bariatric websites. The Google search

engine was accessed to search for duplicate programs. The keywords used are “Bariatric Surgery in (name of state).” Only bariatric programs within the specified state were reviewed for components of health education strategies and behavior change theories. The search was repeated in February 2002 to determine if any new programs had been added and to insure no programs had been missed.

### **Eligibility Criteria for Selection**

Programs included in the study were located in one of the five states: Michigan, Indiana, Ohio, Wisconsin, Illinois, and had to have a working web site between the dates of October-November 2001 and February 2002. Programs that were part of a franchise chain were reviewed in the first state that it occurred and eliminated from additional states where it was found.

### **Evaluation Tool Development**

The tool used to analyze the web site was developed based on a literature review and personal contact with other programs. Information was obtained from other bariatric programs by networking with other bariatric surgery professionals at the Annual Meeting for the American Society of Bariatric Surgery in June 2001. Information regarding multidisciplinary teams, orientation/informational sessions, pre- and post-surgery education, and support groups were shared /among the conference participants. Information about various weight loss programs and their structures were also reviewed, especially the format of medically supervised, strong behavioral component programs for the chronic obese. The literature review was used to establish components that needed to be incorporated into a bariatric program to increase success for the consumer.

The evaluation tool is a survey divided into program components and the selected behavior change model and theories (see Appendix 4). The program components include orientation/informational sessions, pre-surgical program, post-surgical program, support groups, and long-term follow-up. The questions under each program category address the components and the education strategies used to promote success and add quality to the bariatric program. The categories addressing each of the selected behavior change model and theories included the constructs helped to define them. The questions under each construct were asked to determine if there is evidence present related to the model and theories. The response to the questions was either yes, the information was communicated within the program's web site, or no, it was not discernable within the program's website.

After using the tool for evaluating the state of Michigan, two questions were revised. Some programs used a multi-disciplinary team but did not have a structured pre-surgical program or post-surgical program, so a separate section about multi-disciplinary teams was added to the tool. Under this section the question asked if the program utilized a multi-disciplinary team. Another change to the tool addressed the perceived barriers construct of the Health Belief Model. The revised tool included a question asking if programs accepted insurance for the cost of surgery instead of asking if health insurance covered the cost. The purpose for asking about insurance was to address the primary barrier of acquiring the surgery due to cost. The programs in Michigan were re-evaluated after the changes were made to the tool.

**Analysis Plan—Univariate Analysis**

Univariate analysis was used. The educational strategies and the constructs of the behavior modification theories were the variables analyzed. The analysis involved the frequency distribution of the variables across the bariatric programs within the five states. A frequency distribution is more meaningful if one frequency is expressed relative to another (O'Sullivan & Rassel, 1999). Percentages were used to compare the frequency of variables used in the selected bariatric programs.

### Study Results

In the months of October and November 2001, a web search for “bariatric surgery in (name of state)” was conducted using the American Online (AOL) search engine and Google search engine. The web search was conducted again in the month of February 2002 to make sure no program was overlooked. The breakdown of the web search is displayed in Table 1.

**Table 1**  
**Results of Computer Search using Bariatric Surgery in (Name of State) as the Keyword**

State	Month	AOL	GOOGLE	Reviewed	Accepted
Michigan	Oct.-Nov.	360	308	49	5
	February	483	370		
Indiana	Oct.-Nov.	158	169	33	2
	February	259	205		
Ohio	Oct.-Nov.	476	371	52	5
	February	568	412		
Wisconsin	Oct.-Nov.	232	106	20	2
	February	382	233		
Illinois	Oct.-Nov.	370	292	30	5
	February	381	286		

In reviewing the matching sites for each state, it was evident that many matches were not appropriate for this study. Listed were topics such as; job postings, abstracts, physician vitae, directories, organizations and others that had no association with bariatric surgery. Bariatric programs from other states were also listed. Out of the number of matching sites, only a small number (N=184) were reviewed. The review was



to verify what the site actually presented. If the site did not meet eligibility criteria, it was not included in the study. Even a smaller number (N=19) met criteria and was accepted into the study. The nineteen programs accepted into the study were then reviewed using the criteria from the survey tool (Appendix 4a).

### **Overview of Health Education Strategies and Behavior Change Theories**

To show integration of health education strategies and behavior change theories a comparison overview of the nineteen bariatric programs assessed is displayed in Table 2. The overview looks at the usage and integration of health education strategies and behavior change theories. Of the seven health education strategies assessed by the survey tool, bariatric programs utilized an average of 3.6 strategies. At least one strategy was used by each of the nineteen programs. The health belief model used an average of 3.3 constructs in bariatric programs. Only one program did not reveal the use of this model. The transtheoretical model assessed for six of its constructs. Of the six constructs the average utilization was 2.7 with all programs displaying some usage of the transtheoretical model. The survey tool assessed the social cognitive theory for four constructs for an average utilization of 1.2 constructs. Two of the nineteen programs did not reveal the use of the social cognitive theory in their bariatric programs. Eleven programs displayed use of the self-efficacy theory and utilized 0.9 constructs in bariatric programs. The survey tool assessed a total of twenty-four constructs for each of the nineteen programs and the bariatric programs used the average of 11.7 strategies/constructs. There were nine programs that used twelve constructs/strategies or more in the bariatric program web sites. The highest number of constructs used in any program was nineteen. The lowest number of constructs used was six.

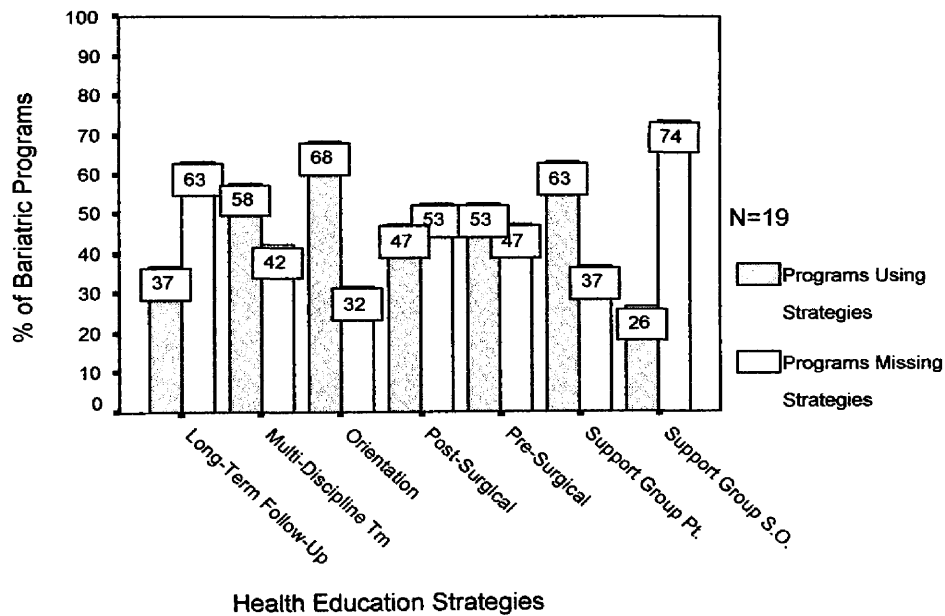
**Table 2**  
**Comprehensive Overview of the Usage of Health Education Strategies and Behavior Change Theories**

<b>Health Education Strategies and Behavior Change Theories</b>						
	<b>Health Education Strategies</b>	<b>Health Belief Model</b>	<b>Trans-theoretical Model</b>	<b>Social Cognitive Theory</b>	<b>Self-Efficacy</b>	<b>Total</b>
	<b>Constructs N=7</b>	<b>Constructs N=4</b>	<b>Constructs N=6</b>	<b>Constructs N=4</b>	<b>Constructs N=3</b>	<b>Constructs N=24</b>
<b>Program ID #</b>	<b>n=</b>	<b>n=</b>	<b>n=</b>	<b>n=</b>	<b>n=</b>	<b>n=</b>
1	4	0	1	1	0	6
2	3	4	5	1	2	14
3	4	4	4	2	2	16
4	3	4	1	1	0	9
5	4	3	3	1	0	11
6	2	4	1	1	0	8
7	7	2	3	1	0	13
8	6	4	4	3	2	19
9	1	4	2	0	1	8
10	3	3	3	1	2	12
11	2	4	3	1	1	11
12	2	4	4	2	2	14
13	1	4	1	1	0	7
14	6	1	2	0	0	9
15	1	4	2	2	2	11
16	6	3	4	1	0	14
17	1	3	1	1	1	7
18	6	4	3	1	1	15
19	6	4	5	1	2	18
<b>Average</b>	<b>3.6</b>	<b>3.3</b>	<b>2.7</b>	<b>1.2</b>	<b>.9</b>	<b>11.7</b>

**Health Education Strategies**

**Orientation/Informational Session Strategies**

The survey tool first addressed strategies for health education. The results of health education strategies are displayed in Figure 1. Orientation/informational session was the most used strategy with 68% (n=13) of programs providing an orientation/informational session to potential clients. In programs that had an orientation/informational session, only one program charged for orientation/informational session. It was not known in most cases if it was a team presentation or one person presenting and the programs did not indicate if a previous, successful patient presented at the orientation/informational session.



**Figure 1. Health Education Strategies**

**Pre-Surgical Strategies**

Fifty-three percent (n=10) (see Figure 1) of bariatric programs provide some pre-surgical education and services with only one (5%) program having a structured

pre-surgical program. Five (26%) bariatric programs indicated that a multidisciplinary team was used, with 26% (n=5) of programs also providing pre-surgical nutritional education. Four (21%) programs provided exercise education and psychological assessments of patients were performed in eight (42%) of the programs. Two (11%) bariatric programs offered group and /or individual behavior modification/psychological sessions, with one (5%) program having their patients follow a weight loss program prior to having surgery. No program offered individualized problem solving consultations with appropriate team member. A program fee was not listed for any program and there was no mention in any of the programs if insurance or an out-of-pocket fee covered the program.

### **Post-Surgical Strategies**

Post-surgical strategies were used in 53% (n=10) of the programs (see Figure 1) and three (16%) of the nineteen programs had a structured post-surgical program. Four (21%) programs post-surgery used a multidisciplinary team with nutrition education being the most frequently used strategy in the post-surgical period with 47% (n=9) programs. Seven (37%) bariatric programs reported some type of post-surgery follow-up, six (32%) programs providing exercise education and five (56%) bariatric programs provided group and/or individual behavior modification psychosocial sessions. Only two (11%) programs offered individualized problem solving consultation with appropriate team members and no program listed fees for service and/or coverage by health insurance for the post-surgical program.

### **Support Group, Long Term Follow-Up & Multidisciplinary Team Strategies**

The next strategy was providing support groups for bariatric patients. Active support groups for bariatric patients were reported in 53% (n=10) of the programs reviewed (see Figure 1), with only 26% (n=5) of the programs allowing family members and friends to attend the support groups. Thirty-six percent (n=6) of the bariatric programs reported long-term follow-up. Four (21%) of the programs provided long-term nutrition education and two (11%) programs included exercise education and classes during the long-term follow-up period. The last strategy was the use of a multidisciplinary team approach and was identified in 58% (n=11) of bariatric programs.

### **The Health Belief Model and Constructs**

The Health Belief Model (HBM) with the results of the four assessed constructs are displayed in Figure 2. The first construct of perceived susceptibility assessed programs for individuals at risk for weight related health conditions by describing weight and/or BMI requirements, was evident in 90% (n=17) of the programs. Perceived severity that described weight related co-morbidities was found in 79% (n=15) of the bariatric programs. Perceived benefits addressed the program to see if they described the expected weight loss and the benefits of weight loss and was evident in twelve (63%) programs. The last construct of perceived barriers were present in eighteen (95%) of the bariatric programs and cost many times is a barrier that must be overcome in order for an individual to follow the health recommendation. Displayed in Table 3 is the breakdown of the evaluation criteria for perceived barriers. Eleven (58%) programs described the necessary lifestyle changes and ten (53%) programs described the risks/complications of bariatric surgery. Only two (11%) programs gave the cost of bariatric surgery but no

program gave the cost of a pre- and post-surgical program. When the programs web sites were reviewed for the question asking if they accepted health insurance for payment of bariatric surgery, sixteen (84%) programs indicated the affirmative.

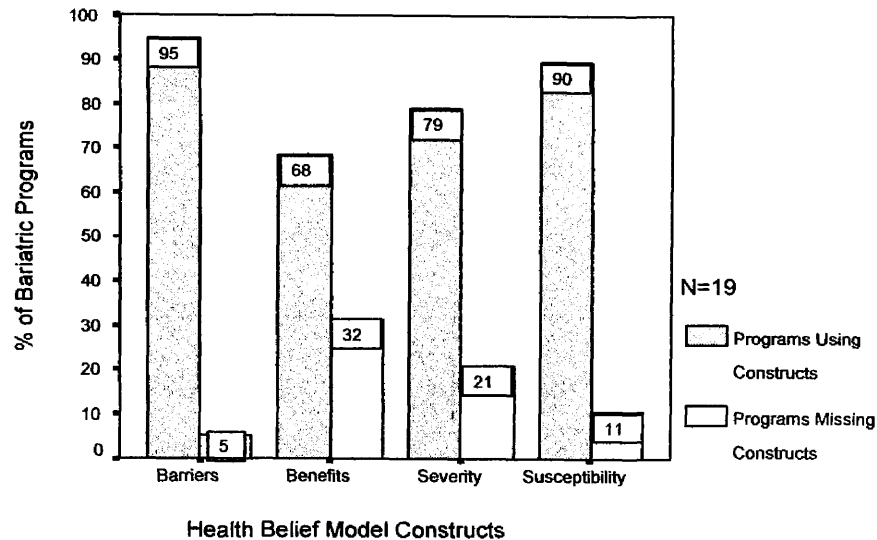


Figure 2. Health Belief Model

Table 3  
Health Belief Model—Breakdown of Evaluation Criteria

Health Belief Model Evaluation Criteria	Number of Programs n=	Percentage of Programs %
<b>Perceived Susceptibility</b>		
1. Does the program describe who is at risk for weight related health conditions (e.g. BMI, weight requirements)?	17	89%
<b>Perceived Severity/Threat</b>		
1. Does the program describe the weight related co-morbidities?	15	53%
<b>Perceived Benefits</b>		
1. Does the program describe the expected weight loss?	12	63%
2. Does the program describe the benefits of weight loss?	12	63%
<b>Perceived Barriers</b>		
1. Does the program describe the necessary lifestyle changes needed for success (e.g. diet, exercise, etc)?	11	58%
2. Does the program describe the risks/complication of bariatric surgery	10	53%
3. Does the program include the cost?	2	11%
4. Does the program include the cost of the pre- and post-surgical program?	0	0%
5. Does the program accept health insurance for the cost of surgery?	15	79%

### Transtheoretical Model (TTM) and Constructs

Results of the use of the transtheoretical model and its constructs in bariatric programs are presented in Figure 3. The first construct under this model, known as the stages of change, assessed the individual for their stage of readiness; no program indicated they assessed clients for their stage of readiness. The second major construct is the processes of change. The first process assessed was that of consciousness raising and 42% (n=8) of programs demonstrated a variety of media to increase the awareness of the benefits and risks of obesity and weight loss surgery. The process of dramatic relief was utilized by eleven programs (58%), the process of self-liberation was present in one (5%) program, and the process of helping relationships was present in 58% (n=11) programs. Decisional balance is the third major construct and was the most used construct with 90% (n=17) of the bariatric programs demonstrating utilization of this construct. The construct of self-efficacy is discussed as a separate theory.

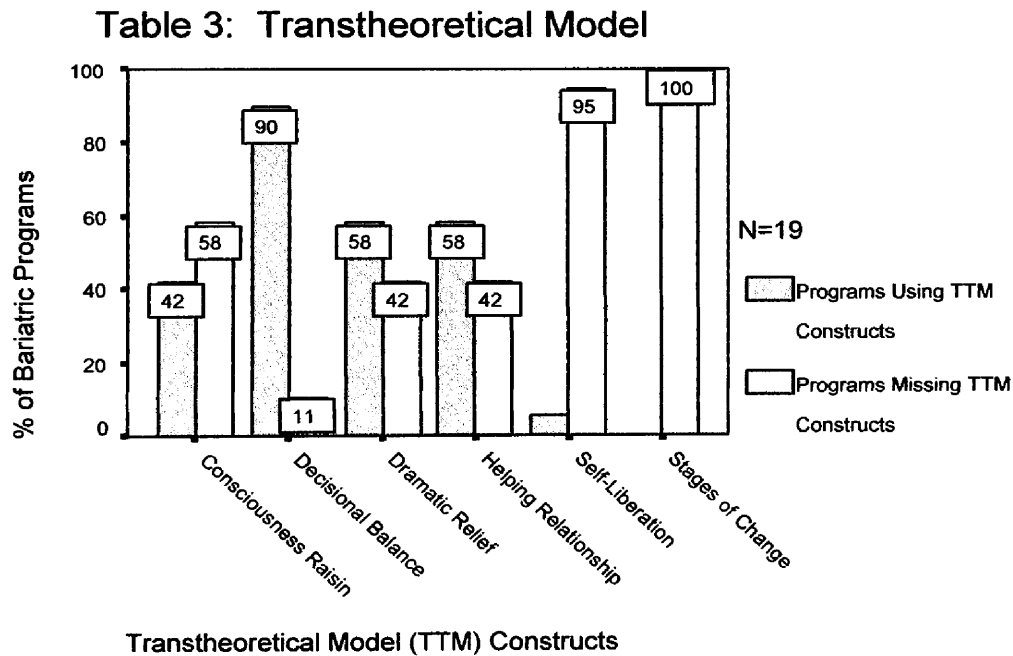


Figure 3. The Transtheoretical Model

A breakdown of the evaluation criteria used in the survey tool for the transtheoretical model is displayed in Table 4. The construct of decisional balance addressed the pros and cons of behavior change as it relates to bariatric surgery. This construct was the most used construct of the transtheoretical model. The benefits of surgery and weight loss were present in twelve (63%) programs and the expected rate of weight loss was also reported in 12 (63%) programs. Health insurance typically covers the cost of bariatric surgery which can vary from program to program and averages \$30,000-\$50,000. Eighty-four percent (n=16) of the bariatric programs accepted health insurance, which is viewed as a benefit. If an individual had to pay out of pocket for the procedure, it would have been viewed as a con. Nine (47%) programs described complications of bariatric surgery, while three (16%) programs discussed the failure rate. Only two (11%) programs gave the cost of the surgery with no programming discussing out of pocket costs. The process of dramatic relief assessed programs to see if they used testimonials in their advertisements, this was reported in eight (42%) programs. Only one program mentioned that former clients came to orientations to tell their stories and experiences, with 32% (n=6) stating potential clients could attend support groups before bariatric surgery. The process of self-liberation was demonstrated by behavior contracting which was not present in any program and goal setting and was present in one (5%) program. The process of helping relationships assessed programs for providing group therapy pre- and post-surgery. No program provided pre-surgery therapy and one program provided post-surgery therapy. This process also assessed for bariatric support groups, which were present in 12 (63%) programs, and 5 (26%) programs encouraged family and friends involvement in support group and education classes.

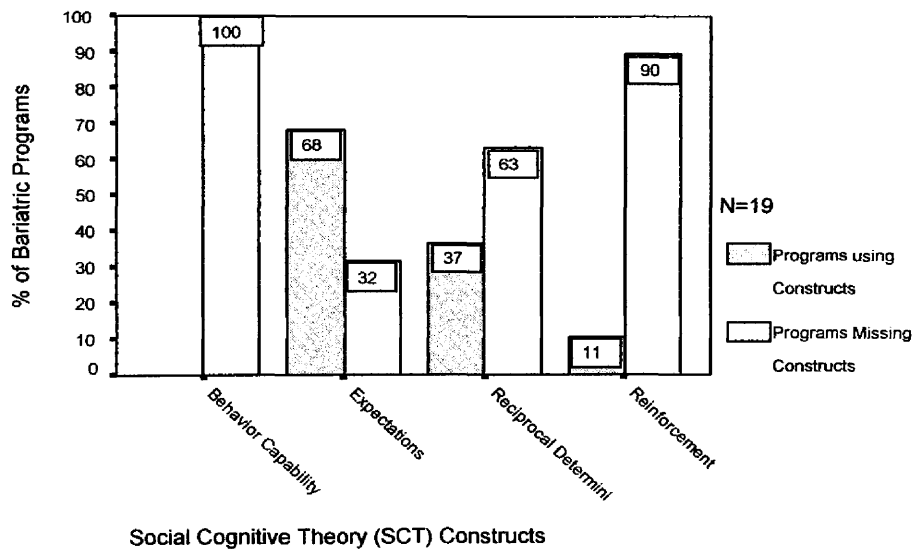


**Table 4**  
**Transtheoretical Model—Breakdown of Evaluation Criteria**

<b>Transtheoretical Model Evaluation Criteria</b>	<b>Number of Programs n=</b>	<b>Percentage of Programs %</b>
<b>Stages of Change</b>		
1. Is the client assessed to determine their stage of readiness?	0	0%
<b>Decisional Balance</b>		
1. Does the program describe the benefits of bariatric surgery? (Pro)	12	63%
2. Does the program give the expected rate of weight loss? (Pro)	12	63%
3. Does the program describe the benefits of weight loss? (Pro)	12	63%
4. Is health insurance accepted? (Pro)	15	79%
5. Are the negatives of having surgery listed:		
a. The complications of surgery?	9	47%
b. The rate of failure?	3	16%
c. Cost of the program?	2	11%
d. Is it an out of pocket cost? (Cons)	0	0%
<b>Processes of Change</b>		
<b>Consciousness Raising</b>		
1. Does the program use a variety of media to increase the awareness of the risks of obesity and the benefits of weight loss surgery (brochures, video, website, orientation sessions, etc)?	8	42%
<b>Dramatic Relief</b>		
1. Does the program use testimonials from previous participants in the written materials and advertisements?		
2. Does the program orientation bring in former participants to tell their story?		
3. Are potential clients allowed to attend the bariatric		
<b>Self-Liberation</b>		
1. Is behavior contracting done with the participants?	0	0%
2. Is behavior goal setting done with the participants?	1	5%
<b>Helping Relationships</b>		
1. Does the program provide group therapy:		
a. Pre-surgery?	1	5%
b. Post-surgery?	0	0%
2. Does the program encourage provide individual counseling for areas of need with the appropriate team member?	1	5%
3. Does the program provide a support group?	12	63%
4. Does the program encourage family/support members involvement in support groups and educational sessions?	5	26%

### Social Cognitive Theory (SCT) and Constructs

Results of the four constructs assessed for in the Social Cognitive Theory (SCT) can be viewed in Figure 4. The first construct of Reinforcement is used in 11% (n=2) of the bariatric programs. The second construct of behavior capability assessed to see if programs provided education of the behavior changes and then allowed the clients to practice the skills necessary for change. This construct was not evident in any of the bariatric programs reviewed. The construct of expectations occurred in 13 (68%) bariatric programs. Twenty-one percent (n=5) of bariatric programs reported utilization of the assessed criteria for reciprocal determinism.



**Figure 4.** Social Cognitive Theory

The breakdown of the assessed criteria for the constructs of the social cognitive theory is displayed in Table 5. In the review of the first construct, reinforcement, the survey tool assessed programs to see if incentives for healthy behaviors were offered and this was not found in any program. The tool also assessed for a buddy system or mentor to reinforce positive behavior and again this was not found in any program. The last

criteria for reinforcement asked if the program brought back a successful client to interact with clients and to promote healthy behaviors with them and 2 (11%) programs indicated that they did bring back a former client. The construct of expectations included 58% (n=11) programs explaining the expected weight loss and eight (42%) programs described education on post-surgery expectations. In assessing for reciprocal determinism 21% (n=4) of the programs encouraged family and support members to attend support group pre-surgery, seven (37%) programs encouraged them to attend post-surgery, and one (5%) program offered education to family and support members.

**Table 5**  
**Social Cognitive—Breakdown of Evaluation Criteria**

<b>Social Cognitive Theory Evaluation Criteria</b>	<b>Number of Programs n=</b>	<b>Percentage of Programs %</b>
<b>Reinforcement</b>		
1. Does the program provide incentives for healthy behaviors (e.g. following a meal plan as evidenced by a food diary. Exercising as evidenced by exercise log or enrollment in a class)?	0	0%
2. Does the program offer a buddy system or mentor program?	0	0%
3. Does the program bring back successful clients to interact with those currently going through the program?	2	11%
<b>Behavior Capability</b>		
1. Does the program provide education (group or individual) and allows the participant to practice skills that are necessary for change (e.g. exercise, learning to sip instead of gulp, eating skills, how to handle trigger foods)?	0	0%
<b>Expectations</b>		
1. Does the program describe the expected weight loss?	11	58%
2. Does the program educate the participant on what to expect after surgery (pain, progression of eating, activity)?	8	42%
<b>Reciprocal Determinism</b>		
1. Does the program encourage family and support members to attend support groups:		
a. Before surgery?	4	21%
b. After surgery?	7	37%
2. Does the program offer education (group or individual) to family and support members?	1	5%

### Self-Efficacy and Constructs

The results of the assessed constructs of Self-Efficacy are displayed in Figure 5. Traits of verbal persuasion were assessed for benefits of surgery and weight loss in hopes that the suggestion of better health would promote behavior change and was evident in 47% (n=9) of the bariatric programs. Vicarious experience evaluated programs to see if they utilized a previous successful client to present their story to potential clients, which occurred in 47% (n=9) of the programs. Bariatric programs were reviewed for the construct of performance accomplishments by asking if the programs offered group behavior sessions that instructs and has clients practice skills necessary for success and were not demonstrated by any of the programs. The construct of emotional arousal was not assessed because clients would have to be contacted and evaluated for their state of anxiety.

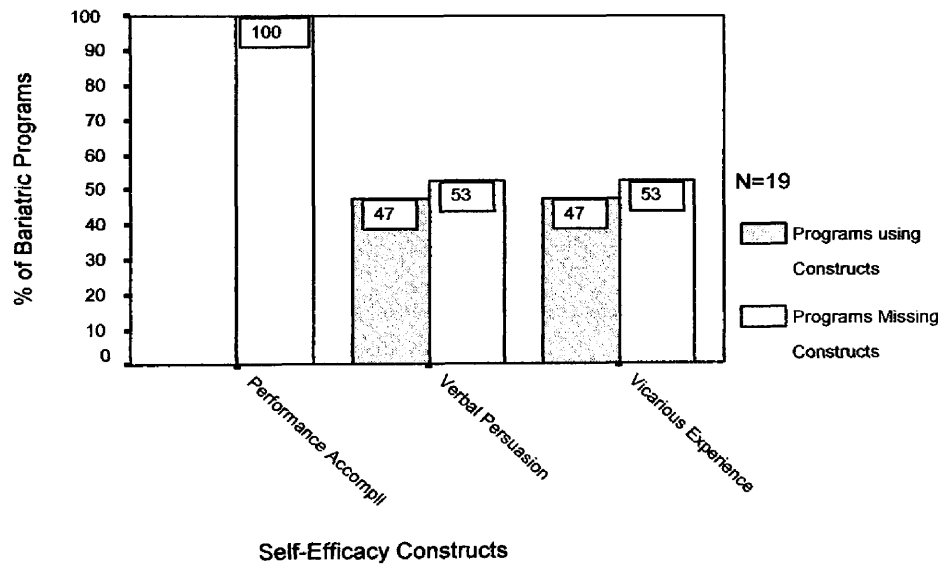


Figure 5. Self-Efficacy

## **Discussion**

The purpose of this study was to see if bariatric surgery programs had integration of health education strategies and behavior change theories and to what extent they were being used. The results of univariate analysis demonstrated that bariatric programs do integrate health education strategies and behavior change theories with some theories and constructs more widely used than others. It was found that the more strategies and theory constructs observed on the program's web-site gave the reviewer a more complete picture of what the program had to offer potential clients. The more complete a program is viewed, may lead the client to think it is a quality bariatric program. It was also found that the theories and models were similar and the constructs utilized many of the same strategies. For one to know if health education strategies and behavior change theories are beneficial, short-term and long-term program outcomes need to be studied. This will then assist in defining what a quality bariatric program should look like.

### **Health Education Strategies**

#### **Orientation/Informational Session**

Orientation/informational session was a strategy that was used and shared by many professionals at the American Society of Bariatric Surgery in June 2001 as a way of disseminating information and educating potential clients about bariatric surgery. Many of the programs reviewed for the study provided a free orientation/informational session for potential clients and significant others to attend. These sessions typically provided information about the bariatric program and its components, such as, the type of surgery performed, complications and risks and the benefits of surgery. The sessions allow clients to ask questions and to meet the members of the programs team and at times

a successful previous client. The team educates potential clients of the perceived susceptibility and the severity of obesity. They discuss the benefits of surgery and weight loss. This is important because it is seen in the transtheoretical model as decisional balance and the benefits and barriers of the health belief model. It also explains the expectation of surgery as it relates to how quickly the client will lose weight and the resolution of co-morbid conditions. The session provides valuable information that may be useful in making an informed decision on whether or not to have surgery and what program offers the best chance for long-term success, although the orientation/informational session may not directly impact the clients' performance post-surgery. The orientation/informational session is an important component to any program because it is the clients' first contact with the program and allows the client to see what the program has to offer them. This may be a key strategy in the development of a bariatric program.

### **Pre- and Post-Surgical Strategies and Long-Term Follow-Up**

According to the NIH Consensus Statement on Gastric Bypass Surgery (1991), one of the guidelines for patient selection is that the patients be well informed, motivated and clearly and realistically understands how their lives may change after the surgery. This can be achieved through the pre- and post-surgical strategies, regardless of whether the program is a formal program. Results of the web site review did not show strong support for pre- and post-surgical strategies. The pre- and post-surgical programs provide education about the surgical procedure, gastric capacity and function, nutrition, exercise, behavior modification and problem solving skills. These components of education were identified in the literature as critical for good outcomes and long-term success (Shikora,

2000 & Smiertka & MacPherson, 1996). This critical component of the pre-surgical program is preparing and educating the individual and assisting them to the preparation and action phase of the transtheoretical model. Based on the transtheoretical model, which address the person's readiness to change, if the individuals are in the preparation (planning change within the next 30 days) or action phase (individual is currently modifying their behavior) at the time of surgery, they are more likely to engage in the behaviors that will help them to be successful. If they are engaging in the behaviors necessary for success before surgery, they are more apt to feel self-efficacious, a critical component for successful behavior change, and use the behaviors post surgery.

One has to remember that bariatric surgery is a tool for weight loss and not a "cure" for obesity. The NIH guidelines also indicated that the programs offer support for all aspects of management, assessment and life long medical surveillance of patients. According to Shikora (2000), patient compliance and successful outcomes are directly related to the number of post-surgery follow-ups. Patients need to stay in contact with the surgical program and address issues as they come up. During these visits, patients are assessed for psychosocial issues, ongoing nutritional concerns and deficiencies, and screen for potential failure. Long-term follow-up is also critical with weight loss from bariatric surgery because it provides a means for enforcement. This is an integral part of the learning process and may help to prevent relapse and promote successful weight loss. Long-term follow-up of patients also allows programs to collect outcome data, which will provide programs with information to evaluate the strategies and improve upon them.

## Support Groups

The health education strategy of bariatric support groups appeared as an important strategy for bariatric patients. Support groups were found to be a necessary forum in providing the necessary education, emotional and behavioral support for clients both pre- and post-surgery. The literature supports a supportive family and social structure from the very beginning of the surgical process and continued through the post-surgical phase (Smierka & MacPherson, 1996). Over half the programs provided a support group for clients that typically met one to two times per month. Support groups incorporates the construct of helping relationships of the transtheoretical model which uses and seeks social support in keeping the individual engaged in healthy behaviors. A concern is the involvement of significant others in the educational sessions and support groups. Both the client and the support system are affected by the surgery outcomes and the necessary behavior change needed for success. Family and friends should be encouraged to attend support group sessions since they provide the daily ongoing support and provide feedback to the individual to reinforce their healthy behavior. Having people engaged in the support group is a way of providing verbal persuasion based on the self-efficacy theory and the social cognitive theory. Verbal persuasion is a way of increasing self-efficacy to motivate the individual to maintain behavior change.

Reinforcement is another important aspect of support groups. Through reinforcement of positive behavior change, there is greater likelihood of that behavior reoccurring; therefore the use of support group sessions will help significant others to develop an understanding of the surgery, lifestyle changes, and the psychosocial changes that can occur with bariatric surgery. Their support or lack of may affect the long-term



success of the patient. If there is a lack of understanding or a fear of the surgery, family and friends may not support the patient but may undermine the patient's efforts that can affect the success and long-term outcomes.

### **Multidisciplinary Team**

According to the NIH and the Institutes of Medicine, all obesity treatment programs (which would include bariatric surgery) should be multi-disciplinary and involve professionals from behavioral, nutritional, and exercise fields to facilitate the delivery of patient treatment strategies (Hunter, et al., 1997). The strategy of a multidisciplinary team is a proven and integral component in bariatric programs because it helps to reinforce the necessary behavior changes and education needed for successful, long-term outcomes. This was supported by over half the programs reviewed. The NIH guidelines for gastric surgery recommend careful selection of patients after an evaluation by a multi-disciplinary team with medical, surgical, psychiatric and nutritional expertise. The team provides the on-going assessment during the pre-surgery, post-surgery, and long-term follow-up stages. The team provides education and support for patients and family members, reinforces the behavior changes required, the need for proper nutrition, exercise and help with improving self-esteem (Smierka & MacPherson, 1996). Reinforcement according to the social cognitive theory is necessary for learning these healthy behavior changes and it also discourages unacceptable behavior, this can be accomplished by direct reinforcement from the multidisciplinary team. It is recommended that the team include the medical physician, surgeon, nurse, dietitian, psychologist, exercise specialist and other necessary health professionals (Blocker & Ostermann, 1996). With the study programs that indicated they utilized a multi-

disciplinary team, the team typically consisted of the surgeon, nurse, and office staff. If the offices did not have a nutritionist or registered dietitian as a part of their staff then the patients were referred to a dietitian. Many programs also referred clients to a psychologist for screening and follow-up. An exercise specialist was the team member most often missing with programs. Exercise is a key component for weight loss and the maintenance of weight loss. A couple of programs referred clients to an exercise program associated with the hospital where the surgical procedure was performed.

### **Behavior Change Theories**

Behavior change is essential for long-term success. Due to the complexity of behavior change and the difficulty to achieve and maintain that change, bariatric programs are using a combination of theories and their constructs. It is known that certain models work better in certain situations depending on what and to whom the program wants to target (Glanz, et al, 1990). Different theories are dependent on the behaviors you want to change. The individual should not be regarded as the soul context for intervention. The individual-focused interventions have the advantage of being tailored to a specific target population but lacks reach (Glanz, et al, 1990). Not only should health education programs include the intrapersonal theories but should include those directed at interpersonal processes as well (Glanz, et al, 1990). Behavior change is difficult enough to achieve and if it is not reinforced at the other levels it is even more difficult to sustain (Glanz, et al, 1990).

### **Health Belief Model**

The Health Belief Model was easily identifiable and used by more programs than the other models. It helps to explain why individuals would or would not use the health

services (McKenzie & Smeltzer, 2001). Because of its intrapersonal characteristics, obese individuals could easily identify themselves as being susceptible for illness or morbidity due to obesity. The individual is able to determine how severe their condition is if the co-morbidities were listed. They were also able to identify the benefits of surgery and weight loss by the improvement and/or resolution of health problems. If an individual does not see themselves as susceptible to illness or morbidity or understand the severity of the co-morbidities related to obesity, then they would not view surgery a treatment option and remain obese. If they understand that they are susceptible and realize the severity then the benefits of weight loss due to bariatric surgery are understood, surgery becomes an option and successful outcomes are more likely. The potential barriers to surgical treatment were stated. Barriers play a major role in whether a person engages in a change and of the major barriers is cost. Most programs resolved the cost barrier of surgery by accepting health insurance, which in many cases covered the cost of surgery.

### **Transtheoretical Model**

The transtheoretical model is an integrative framework for understanding how individuals progress toward adopting and maintaining health behavior changes for optimal health. The model “is based on critical assumptions about the nature of behavior change and interventions that can best facilitate change” (McKenzie & Smeltzer, 2001). Using the transtheoretical model can be an asset in developing bariatric programs because this model assesses the specific stage of the client and provides a mean for individuals to move through the stages. The five core constructs of the transtheoretical model are the stages of change, the processes of change, the pros and cons of changing, self-efficacy

and temptation. The study did not assess the specific stages but looked at it as one general component. No program indicated that they assessed their clients for stage of readiness. By knowing what stage the client is at would help the program's team members to incorporate the appropriate interventions to assist the client in reaching the preparation and action stages and therefore improving the chance of successful outcomes for bariatric surgery. If the client has not reached either of these stages the chance of success are less. In assessing the second major construct of the transtheoretical model, the processes of change, the study was only able to analyze four out of the ten processes. The other six processes were not assessed because one needed to have direct observation and/or contact with the client and program. By incorporating the processes into a bariatric surgery program the team members can better develop the interventions best suited for the client. Through consciousness raising the client can learn tips on how to change their eating habits and learn about the necessity of health nutrition and exercise for successful outcomes.

Dramatic relief, another process from the transtheoretical model, use in a program can allow for the client to express their fears and anxieties about having surgery and the health risks associated with remaining obese. It is important to use testimonials, which are better in person than written, because the client can better identify themselves with the individuals and feels if they can do it, I can do it. Testimony from a previous client can express how they overcame their fears and anxiety of surgery, the benefits of weight loss and describe how they are doing and what they are doing to be successful. Relaying this information to clients currently engaged in the bariatric program as a way of

reinforcing behavior change through motivation, alleviating fears and anxiety, and modeling positive behavior.

Another important process to the success of surgery is self-liberation. The individual needs to be committed and willing to make the necessary behavior changes, they cannot think that the surgery is a “cure” and their weight loss will make their life better. If changes are not made, the chance and degree of success are less.

In addition, support groups and encouraging family and other support persons is a way of incorporating helping relationships into a program. This is important because the individual seeks and uses social support for healthy behavior change. This can help the individual maintain healthy behaviors and in preventing and/or dealing with relapse. With relapse, family, friends, and health professionals can be supportive and provide encouragement for healthy behavior when the individual is experiencing a lapse in behavior, such as reverting back to unhealthy eating habits.

Decisional balance or the pros and cons are important to behavior change because the individual needs to have more positive reasons for changing than negative. If the individual has more negative reasons for having surgery and weight loss, more than likely they won't do it and will suffer the affects of obesity. The individual needs to have more positive reasons than negative, when this is present then they are more likely to be successful at changing the behavior. The fifth construct of self-efficacy was reviewed as its own theory.

### **Social Cognitive Theory**

The Social Cognitive Theory believes that reinforcement contributes to learning, but reinforcement along with an individual's expectations of the consequences of

behavior determines the behavior (McKenzie & Smeltzer, 2001). This theory is used at the interpersonal level that allows social support networks of family and friends to help encourage and motivate the individuals in making the necessary behavior change. This theory helps one to understand the complex relationships between the individual and the environment and how their actions and conditions can reinforce or discourage change. Four constructs from this theory were reviewed: reinforcement, behavioral capability, expectation, and reciprocal determinism.

Reinforcement is necessary for healthy behaviors to reoccur. Individuals need to have positive feedback for a job well done when they have exhibited healthy behaviors. Without this reinforcement the individual would continue to practice inappropriate behaviors that would lead to poor outcomes of bariatric surgery and weight loss.

For bariatric surgery, to be successful, behavior capability should also be present. The individual must know that surgery along with behaviors of diet and exercise are necessary for weight loss and they need to know how to perform these behaviors. It is necessary that individuals be provided with knowledge and skill, without having the knowledge and skills, behavior change is difficult.

The construct of expectation is important because if the individual expects weight loss after bariatric surgery when they perform certain diet and exercise behaviors, then the individual will have successful outcomes from bariatric surgery. If the individual follows the diet guidelines after surgery and for the following year, they can expect to lose a certain percentage of their excess body weight. If the individual does not follow the diet and exercise guidelines, they may lose weight but not as well.

Reciprocal determinism is the interaction between the individual, the behavior and the environment. The person going through bariatric surgery needs the support of family and friends in making the appropriate behavior changes. Without knowledge and understanding, family and friends could undermine the individual's efforts causing poor outcomes.

The constructs not reviewed were expectancies (values people place on expected outcomes), locus of control (perception of the center of control over reinforcement), self-control (gaining control over own behavior through monitoring and adjusting it), and emotional coping response (able to deal with the sources of anxiety that surrounds a behavior) because the reviewer would have to have direct contact with the individuals going through the bariatric surgery programs to see if these constructs were present. The Social Cognitive Theory was not well integrated into the bariatric programs. The reviewer found bariatric programs targeted the individual seeking treatment but did not find where family and support members were encouraged to participate in the educational process or support groups. Programs need to involve family and support members in the educational process for them to understand all aspects of bariatric treatment so they can be better able to assist and support the individual going through the process.

### **Self-Efficacy**

Self-Efficacy is a construct that is considered to be the most important prerequisite for behavior change. It refers to one's belief that they can successfully execute the behavior required to produce the outcomes (Rosenstock, 1990). The individual needs to have a good deal of confidence and feel competent that they can alter the necessary life-style practices before successful change is possible. Without the

feeling of confidence and competence successful behavior change will not occur resulting in poor outcomes.

Self-efficacy is influenced by several factors and we see the influence through performance accomplishment. These factors are used to motivate, reinforce behavior, and increase confidence in behavior change. The individual needs to master the necessary diet and exercise behavior for successful outcomes, if they have not mastered these behaviors, results from bariatric surgery will be less than optimal. Support groups help to promote vicarious experience for individuals, by observing another client being positively reinforced for their behavior, then the individual feels they can achieve the same success if they practice the appropriate behaviors required. The multi-disciplinary team is instrumental at using verbal persuasion by giving feedback and suggestions to the individual for performing unhealthy behaviors that will have a negative impact on their outcomes and giving positive feedback on behaviors that promote success. Self-efficacy refers to the internal state that an individual experiences, which makes it difficult to evaluate without surveying the individual going through the program. As a result, the construct of self-efficacy demonstrated poor integration in the bariatric programs. The author had discovered towards the end of the research the construct of dieting self-efficacy based on Bandura's construct of self-efficacy. The construct of dieting self-efficacy refers to three beliefs; situation based dieting, behavior based dieting and goal based dieting (Stotland & Zuroff, 1991). Future research needs to be done on how dieting self-efficacy can impact obesity treatment. This in turn may lead to better and more effective treatment options.



### **Benefits and Limitations**

A benefit of using the Internet allows the individual to research topics from one physical setting. The reviewer had easy access to the programs across the United States and was able to review a large number of programs in a shorter period of time. Several limitations to the study included the Internet search itself. This type of research was getting keywords specific enough to filter out unrelated sites. This search required at least two stages of review to make sure sites contain enough information to be included in the study. Another limitation to this study was not having direct contact with the different bariatric programs and/or clients involved with the programs. Having direct contact would have allowed for more in-depth information and clarification of questions related to the constructs of the behavior change theories. The researcher was limited by the information contained in the website. If a program has not placed a priority on web-based marketing, there may be limited information supplied to the consumer. Another limitation was the tool used for the research. Not all constructs could be reviewed because communication with the program or individual was needed to do so. Also, the tool was developed before the researcher discovered dieting self-efficacy and the relationship with Bandura's construct of self-efficacy. Future research should reflect the use of dieting self-efficacy under the construct of self-efficacy.

## **Conclusion and Recommendations**

The findings of this study may provide information to health educators and bariatric program directors interested in developing a bariatric program. It is hoped that the information provided will encourage program developers to use health education strategies and behavior modification theories. Without the key elements of theories and models being used in the development of health education programs, health outcomes can be affected. Getting people to engage in healthy behavior change is a complicated process that can be difficult under the best of conditions. Without the direction that theories and models provide, health education program planners and educators can waste time and resources in trying to achieve the desired outcome change. Programs should use theories and models that have been tried and tested because they provide the framework on which to build health education programs. A theory-based approach provides direction and justification for the design, implementation and evaluation of program interventions. Appropriate use of behavior change theories and models can help to ensure the connection between the interventions and expected outcomes. It is important that health education program developers and educators have complete knowledge of the various theories and models and their applications before embarking on developing a bariatric surgical program. In the development of new bariatric programs, the health educator needs to include theories and models that address the intrapersonal and the interpersonal aspects of behavior change to have better outcome in terms of bariatric surgery and weight loss.

The study demonstrated the presence of the integration of health education strategies and behavior change theories. To determine if health education strategies and

behavior change theories are beneficial and to define a quality program, this study needs to be taken a step further by examining the program interventions and outcomes as they relate to the strategies and theories. Future studies should include direct contact with bariatric surgical programs and clients.

The promotion of bariatric programs should include information addressing what is obesity, the risks of obesity, who is a candidate for surgery, the type of surgery being offered, the benefits and risks of surgery, the necessary lifestyle changes, information about cost and insurance coverage and any other pertinent program information.

Program outcomes should be included in the information provided. The internet is a good way of letting the public know about the different bariatric programs available and it allows potential clients to compare the different programs before making a decision on where to go for further information and possible surgery.

Studies related to the application of the Health Belief Model, Transtheoretical Model, Social Cognitive Theory and Self-Efficacy of weight loss and weight management programs were limited. Weight loss and weight management programs need to research the interventions and outcomes based on theory to determine which are more effective, especially, since increase weight is becoming a major health concern. The incidence of overweight and obese individuals is increasing at a very rapid rate. New and effective treatment options need to be and should be developed based on the appropriate behavior change theory and/or a combination of theories.

Bariatric surgery is relatively new as a treatment option for obesity. The majority of the research has been devoted to the surgical outcomes and the amount of weight loss. The focus now needs to be on program development, behavior change and related

research to provide the patient with the greatest chance of success for long-term weight management.

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**Appendix 1: Classification of Overweight and Obesity**

Classification of Overweight and Obesity by BMI, Waist Circumference, and Associated Disease Risk*				
	BMI (kg/m <sup>2</sup> )	Obesity Class	Disease Risk* (Relative to Normal Weight and Waist Circumference)	
			Men < 40 in (≤ 102 cm) Women ≤ 35 in (≤ 88 cm)	> 40 in (> 102 cm) > 35 in (> 88 cm)
Underweight	< 18.5		-	-
Normal†	18.5-24.9		-	-
Overweight	25.0-29.9		Increased	High
Obesity	30.0-34.9	I	High	Very High
	35.0-39.9	II	Very High	Very High
Extreme Obesity	≥ 40	III	Extremely High	Extremely High

\* Disease risk for type 2 diabetes, hypertension, and cardiovascular disease (CVD)

† Increased waist circumference can also be a marker for increased risk even in persons of normal weight

Adapted from "Preventing and Managing the Global Epidemic of Obesity. Report of the World Health Organization (WHO) Consultation of Obesity, "WHO, Geneva, June 1997," (NIH et al, 2000).

**Appendix 2: BODY MASS INDEX (BMI) CHART**  
 Height (ft. in.)

Wt. (lb.)	4'10"	4'11"	5'0"	5'1"	5'2"	5'3"	5'4"	5'5"	5'6"	5'7"	5'8"	5'9"	5'10"	5'11"	6'0"
125	26	25	24	24	23	22	22	21	20	20	19	18	18	17	17
130	27	26	25	25	24	23	22	22	21	20	20	19	19	18	18
135	28	27	26	26	25	24	23	23	22	21	21	20	19	19	18
140	29	28	27	27	26	25	24	23	23	22	21	21	20	20	19
145	30	29	28	27	27	26	25	24	23	23	22	21	21	20	20
150	31	30	29	28	27	27	26	25	24	24	23	22	22	21	20
155	32	31	30	29	28	28	27	26	25	24	24	23	22	22	21
160	34	32	31	30	29	28	28	27	26	25	24	24	23	22	22
165	35	33	32	31	30	29	28	28	27	26	25	24	24	23	22
170	36	34	33	32	31	30	29	28	28	27	26	25	24	24	23
175	37	35	34	33	32	31	30	29	28	27	27	26	25	24	24
180	38	36	35	34	33	32	31	30	29	28	27	27	26	25	25
185	39	37	36	35	34	33	32	31	30	29	28	27	27	26	25
190	40	38	37	36	35	34	33	32	31	30	29	28	27	27	26
195	41	39	38	37	36	35	34	33	32	31	30	29	28	27	27
200	42	40	39	38	37	36	34	33	32	31	30	30	29	28	27
205	43	41	40	39	38	36	35	34	33	32	31	30	29	29	28
210	44	43	41	40	38	37	36	35	34	33	32	31	30	29	29
215	45	44	42	41	39	38	37	36	35	34	33	32	31	30	29
220	46	45	43	42	40	39	38	37	36	35	34	33	32	31	30
225	47	46	44	43	41	40	39	38	36	35	34	33	32	31	31
230	48	47	45	44	42	41	40	38	37	36	35	34	33	32	31
235	49	48	46	44	43	42	40	39	38	37	36	35	34	33	32
240	50	49	47	45	44	43	41	40	39	38	37	36	35	34	33
245	51	50	48	46	45	43	42	41	40	38	37	36	35	34	33
250	52	51	49	47	46	44	43	42	40	39	38	37	36	35	34
255	53	52	50	48	47	45	44	43	41	40	39	38	37	36	35
260	54	53	51	49	48	46	45	43	42	41	40	38	37	36	35
265	56	54	52	50	49	47	46	44	43	42	40	39	38	37	36
270	57	55	53	51	49	48	46	45	44	42	41	40	39	38	37
275	58	56	54	52	50	49	47	46	44	43	42	41	40	38	37
280	59	57	55	53	51	50	48	47	45	44	43	41	40	39	38
285	60	58	56	54	52	51	49	48	46	45	43	42	41	40	39
290	61	59	57	55	53	51	50	48	47	46	44	43	42	41	39
295	62	60	58	56	54	52	51	49	48	46	45	44	42	41	40
300	63	61	59	57	55	53	52	50	48	47	46	44	43	42	41
305	64	62	60	58	56	54	52	51	49	48	46	45	44	43	41
310	65	63	61	59	57	55	53	52	50	49	47	46	45	43	42
315	66	64	62	60	58	56	54	53	51	49	48	47	45	44	43
320	67	65	63	61	59	57	55	53	52	50	49	47	46	45	43
325	68	66	64	62	60	58	56	54	53	51	50	48	47	45	44

BMI values that correlate to a higher risk of adverse effects on health

- BMI >=30
  - BMI >=27 in presence of risk factors
- Adapted from the Mayo Clinic Body Mass Index Chart ([http://www.mayo.edu:80/news/Mayo ROCHESTER/1997/07-Jul-97/fenhen/bodymass/bodymass.html](http://www.mayo.edu:80/news/Mayo_ROCHESTER/1997/07-Jul-97/fenhen/bodymass/bodymass.html)).

### Appendix 3: Options for Weight Reduction Therapy

<b>OPTIONS FOR WEIGHT REDUCTION THERAPY</b>	
<b>Health Risk</b>	<b>Treatment Options</b>
<b>Minimal to Low</b>	<ul style="list-style-type: none"> <li>• <b>Healthful eating and/or moderate deficit diet</b></li> <li>• <b>Increased physical activity</b></li> <li>• <b>Lifestyle change strategies</b></li> </ul>
<b>Moderate</b>	<ul style="list-style-type: none"> <li>• <b>All the above plus a low calorie diet (800-1500 kcal/day)</b></li> </ul>
<b>High to Very High</b>	<ul style="list-style-type: none"> <li>• <b>All the above plus pharmacotherapy</b></li> </ul>
<b>Extremely High</b>	<ul style="list-style-type: none"> <li>• <b>All the above plus surgical interventions</b></li> </ul>

Adapted from Shape Up America! and the American Obesity Association. Guidance for Treatment of Adult Obesity. Bethesda, MD, 1996 (Novartis).

## Appendix 4: Survey Tool—Blank

**BARIATRIC PROGRAM EVALUATION—QUESTIONS**

<b>Questions</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>Orientation/Informational Sessions</b>			
1. Is there an orientation or informational session to explain the program in detail before making a decision to participate in the program?			
2. Does the Bariatric Program Team (two or more members) present at this session?			
3. Does a previous successful patient present at this informational meeting?			
4. Is there a fee associated with this session?			
<b>Pre-Surgical Program</b>			
1. Does the Bariatric Program have a structured pre-surgical education program?			
2. Is the pre-program multi-disciplinary (physician, surgeon, nurse, registered dietitian, psychologist, exercise specialist, or other related health professional)?			
3. Is nutritional education provided pre-surgery?			
4. Is exercise education provided pre-surgery?			
5. Is the psychological status of the patient assessed pre-surgery?			
6. Does the program offer (group or individual) behavior modification/psychosocial sessions?			
7. Does the program offer individualize problem-solving consultations with appropriate team members?			
8. Do patients follow a weight loss program prior to surgery?			
9. Is there a fee associated with the pre-surgical portion of the program?			
10. Is this cost covered by health insurance?			
<b>Post-Surgical Program</b>			
1. Does the Bariatric Program have a structured post-surgical program?			
2. Is the program multi-disciplinary (physician, surgeon, nurse, registered dietitian, psychologist, exercise specialist or other related health professional)?			
3. Is nutritional education provided post-surgery?			
4. Does the post-surgery program include follow-up?			

<b>Post-Surgical Program (continued)</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
5. Is exercise education provided post-surgery?			
6. Does the post-program offer (group or individual) behavior modification/psychosocial sessions?			
7. Does the program offer individualized problem-solving consultations with appropriate team members?			
8. Is there a fee associated with the post-surgical portion of the program?			
9. Is this cost covered by health insurance?			
<b>Support Groups</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the Bariatric Program have a support group?			
2. Are family members and support persons encouraged to attend the support group meetings?			
<b>Long-Term Follow-Up</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program have long-term follow-up			
2. Is nutrition education continued during this period?			
3. Is exercise education included during this period?			
<b>Multi-Disciplinary Team</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program utilize a multi-disciplinary team (physician, surgeon, nurse, registered dietitian, psychologist, exercise specialist or other related health professional)?			
<b>Health Belief Model</b>			
<b>Perceive Susceptibility</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe who is at risk for weight related health conditions (e.g. BMI, weight requirements)?			
<b>Perceived Severity/Threat</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the weight related co-morbidities?			
<b>Perceived Benefits</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the expected weight loss?			
2. Does the program describe the benefits of weight loss?			
<b>Perceived Barriers</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the necessary lifestyle changes needed for success (e.g. diet, exercise, etc.)?			

<b>Health Belief Model (continued)</b>			
<b>Perceived Barriers (continued)</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the risks / complications of bariatric surgery?			
2. Does the program include the cost?			
3. Does the program include the cost of the pre- and post-surgical program?			
4. Does the program accept health insurance for the cost of surgery?			
<b>Transtheoretical Model</b>			
<b>Stages of Change</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Is the client assessed to determine their stage of readiness?			
<b>Decisional Balance</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the benefits of bariatric surgery? (Pro)			
2. Does the program give the expected rate of weight loss? (Pro)			
3. Does the program describe the benefits of weight loss? (Pro)			
4. Is health insurance accepted? (Pro)			
5. Are the negatives of having surgery listed: a. The complications of surgery? b. The rate of failure? c. Cost of the program? d. Is it an out of pocket cost? (Con)			
<b>Processes of Change</b>			
<b>Consciousness Raising</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program use a variety of media to increase the awareness of the risks of obesity and the benefits of weight loss surgery (brochures, video, website, orientation sessions, etc)?			
<b>Dramatic Relief</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program use testimonials from previous participants in the written materials and advertisements?			
2. Does the program orientation bring in former participants to tell their story?			
3. Are potential clients allowed to attend the bariatric support groups?			
<b>Self-Re-Evaluation</b>			
<b>Environmental Re-Evaluation</b>			

<b>Self-Liberation</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Is behavior contracting done with the participants?			
2. Is behavior goal setting done with the participants?			
<b>Helping Relationships</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program provide group therapy: a. Pre-surgery? b. Post-surgery?			
2. Does the program provide individual counseling for areas of need with the appropriate team member?			
3. Does the program provide a support group?			
4. Does the program encourage family/support members involvement in support groups and educational sessions?			
<b>Counter Conditioning</b>			
<b>Reinforcement Management</b>			
<b>Stimulus Control</b>			
<b>Social Liberation</b>			
<b>Social Cognitive Theory</b>			
<b>Reinforcement</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program provide incentives for healthy behaviors (e.g. following a meal plan as evidenced by a food diary. Exercising as evidenced by exercise log or enrollment in a class)?			
2. Does the program offer a buddy system or mentor program?			
3. Does the program bring back successful clients to interact with those currently going through the program?			
<b>Behavior Capability</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program provide education (group or individual) and allows the participant to practice skills that are necessary for change (e.g. exercise, learning to sip instead of gulp, eating skills, how to handle trigger foods)?			
<b>Expectations</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the expected weight loss?			
2. Does the program educate the participant on what to expect after surgery (pain, progression of eating, activity)?			

<b>Reciprocal Determinism</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program encourage family and support members to attend support groups: a. Before surgery? b. After surgery?			
2. Does the program offer education (group or individual) to family and support members?			
<b>Self-Efficacy</b>			
<b>Performance Accomplishments</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program offer group behavior sessions that instructs and have clients practice skills necessary for success?			
<b>Vicarious Experience</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program utilize a previous successful client to present their success story?			
<b>Verbal Persuasion</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program provide information on benefits of surgery and weight loss?			
<b>Emotional Arousal</b>			



**Appendix 4a: Survey Tool—Results**

**BARIATRIC PROGRAM EVALUATION—QUESTIONS**

<b>Questions</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
<b>Orientation/Informational Sessions</b>			
1. Is there an orientation or informational session to explain the program in detail before making a decision to participate in the program?	13	6	Individual consultation instead of group orientation. Mail and website only source of orientation.
2. Does the Bariatric Program Team (two or more members) present at this session?	1	18	Physician presenting.
3. Does a previous successful patient present at this informational meeting?	1	18	
4. Is there a fee associated with this session?	0	19	Free orientation session
<b>Pre-Surgical Program</b>			
1. Does the Bariatric Program have a structured pre-surgical education program?	1	18	
2. Is the pre-program multi-disciplinary (physician, surgeon, nurse, registered dietitian, psychologist, exercise specialist, or other related health professional)?	5	14	Surgeon and office staff. Patient counselor.
3. Is nutritional education provided pre-surgery?	5	14	
4. Is exercise education provided pre-surgery?	4	15	Online education
5. Is the psychological status of the patient assessed pre-surgery?	8	11	
6. Does the program offer (group or individual) behavior modification/psychosocial sessions?	2	17	
7. Does the program offer individualize problem-solving consultations with appropriate team members?	0	19	
8. Do patients follow a weight loss program prior to surgery?	1	18	Used carnation breakfast prior to surgery.
9. Is there a fee associated with the pre-surgical portion of the program?	0	19	
10. Is this cost covered by health insurance?	0	19	
<b>Post-Surgical Program</b>			
1. Does the Bariatric Program have a structured post-surgical program?	3	16	
2. Is the program multi-disciplinary (physician, surgeon, nurse, registered dietitian, psychologist, exercise specialist or other related health professional)?	4	15	
3. Is nutritional education provided post-surgery?	9	10	Educated while in hospital.
4. Does the post-surgery program include follow-up?	7	12	The 2 <sup>nd</sup> and 6 <sup>th</sup> week.

<b>Post-Surgical Program (continued)</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
5. Is exercise education provided post-surgery?	6	13	Online education.
6. Does the post-program offer (group or individual) behavior modification/psychosocial sessions?	5	14	
7. Does the program offer individualized problem-solving consultations with appropriate team members?	3	16	Refers patients to other services within their organization.
8. Is there a fee associated with the post-surgical portion of the program?	0	19	Offered at no charge
9. Is this cost covered by health insurance?	0	19	
<b>Support Groups</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the Bariatric Program have a support group?	12	7	Use online chat room as a support system.
2. Are family members and support persons encouraged to attend the support group meetings?	5	14	
<b>Long-Term Follow-Up</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program have long-term follow-up?	6	13	
2. Is nutrition education continued during this period?	4	15	
3. Is exercise education included during this period?	2	17	
<b>Multi-Disciplinary Team</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program utilize a multi-disciplinary team (physician, surgeon, nurse, registered dietitian, psychologist, exercise specialist or other related health professional)?	11	8	
<b>Health Belief Model</b>			
<b>Perceive Susceptibility</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe who is at risk for weight related health conditions (e.g. BMI, weight requirements)?	17	2	
<b>Perceived Severity/Threat</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the weight related co-morbidities?	15	4	
<b>Perceived Benefits</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the expected weight loss?	12	7	
2. Does the program describe the benefits of weight loss?	12	7	
<b>Perceived Barriers</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the necessary lifestyle changes needed for success (e.g. diet, exercise, etc.)?	11	8	

<b>Health Belief Model (continued)</b>			
<b>Perceived Barriers (continued)</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
2. Does the program describe the risks / complications of bariatric surgery?	10	9	
3. Does the program include the cost?	2	17	
4. Does the program include the cost of the pre- and post-surgical program?	0	19	Free.
5. Does the program accept health insurance for the cost of surgery?	15	1	Cash plan available.
<b>Transtheoretical Model</b>			
<b>Stages of Change</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Is the client assessed to determine their stage of readiness?	0	19	
<b>Decisional Balance</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program describe the benefits of bariatric surgery? (Pro)	12	7	
2. Does the program give the expected rate of weight loss? (Pro)	12	7	
3. Does the program describe the benefits of weight loss? (Pro)	12	7	
4. Is health insurance accepted? (Pro)	15	1	
5. Are the negatives of having surgery listed:			
a. The complications of surgery?	9	10	
b. The rate of failure?	3	16	
c. Cost of the program?	2	17	
d. Is it an out of pocket cost? (Con)	0	19	
<b>Processes of Change</b>			
<b>Consciousness Raising</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program use a variety of media to increase the awareness of the risks of obesity and the benefits of weight loss surgery (brochures, video, website, orientation sessions, etc)?	8	11	Online video/movie of procedure. Patient forum—bulletin board. Chat rooms.
<b>Dramatic Relief</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program use testimonials from previous participants in the written materials and advertisements?	8	11	
2. Does the program orientation bring in former participants to tell their story?	1	18	
3. Are potential clients allowed to attend the bariatric support groups?	6	13	
<b>Self-Re-Evaluation</b>			
<b>Environmental Re-Evaluation</b>			

<b>Self-Liberation</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Is behavior contracting done with the participants?	0	19	
2. Is behavior goal setting done with the participants?	1	18	
<b>Helping Relationships</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program provide group therapy:			
a. Pre-surgery?	1	18	
b. Post-surgery?	0	19	
2. Does the program provide individual counseling for areas of need with the appropriate team member?	1	18	
3. Does the program provide a support group?	12	7	
4. Does the program encourage family/support members involvement in support groups and educational sessions?	5	14	
<b>Counter Conditioning</b>			
<b>Reinforcement Management</b>			
<b>Stimulus Control</b>			
<b>Social Liberation</b>			
<b>Social Cognitive Theory</b>			
<b>Reinforcement</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
4. Does the program provide incentives for healthy behaviors (e.g. following a meal plan as evidenced by a food diary. Exercising as evidenced by exercise log or enrollment in a class)?	0	19	
5. Does the program offer a buddy system or mentor program?	0	19	
6. Does the program bring back successful clients to interact with those currently going through the program?	2	17	Provides e-mail addresses for clients to contact and pt. directory.
<b>Behavior Capability</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
3. Does the program provide education (group or individual) and allows the participant to practice skills that are necessary for change (e.g. exercise, learning to sip instead of gulp, eating skills, how to handle trigger foods)?	0	19	
<b>Expectations</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
4. Does the program describe the expected weight loss?	11	8	
5. Does the program educate the participant on what to expect after surgery (pain, progression of eating, activity)?	8	11	

<b>Reciprocal Determinism</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
6. Does the program encourage family and support members to attend support groups:			
a. Before surgery?	<b>4</b>	<b>15</b>	
b. After surgery?	<b>7</b>	<b>12</b>	
7. Does the program offer education (group or individual) to family and support members?	<b>1</b>	<b>18</b>	
<b>Self-Efficacy</b>			
<b>Performance Accomplishments</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program offer group behavior sessions that instructs and have clients practice skills necessary for success?	<b>0</b>	<b>19</b>	
<b>Vicarious Experience</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program utilize a previous successful client to present their success story?	<b>9</b>	<b>10</b>	
<b>Verbal Persuasion</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Does the program provide information on benefits of surgery and weight loss?	<b>9</b>	<b>10</b>	
<b>Emotional Arousal</b>			