THE ROLE OF THE SOCIAL COGNITIVE VARIABLES OF SELF-EFFICACY, LOCUS OF CONTROL, WEIGHT LOSS, AND QUALITY OF LIFE IN POST-BARIATRIC SURGERY PATIENTS

A Dissertation

Presented to

The Graduate Faculty of The University of Akron

In Partial Fulfillment of the
Requirements for the Degree
Doctor of Philosophy

Jane M. Fink
August, 2007
THE ROLE OF THE SOCIAL COGNITIVE VARIABLES OF
SELF-EFFICACY, LOCUS OF CONTROL, WEIGHT LOSS, AND
QUALITY OF LIFE IN POST-BARIATRIC SURGERY PATIENTS

Jane M. Fink

Dissertation

Approved: 
Advisor 
Dr. Linda M. Perosa

Accepted: 
Department Chair 
Dr. Sajit Zachariah

Interim Dean of the College 
Dr. Cynthia F. Capers

Dean of the Graduate School 
Dr. George R. Newkome

Date 

Committee Member 
Dr. Sandra L. Perosa

Committee Member 
Dr. Cynthia A. Reynolds

Committee Member 
Dr. Fred H. Ziegler

Committee Member 
Dr. Suzanne C. MacDonald
This study investigated the relationships between self-efficacy, locus of control, weight loss and quality of life in a population of post-bariatric surgery patients recruited from a community hospital in Cleveland, Ohio. In addition, the variables of self-efficacy, locus of control, weight loss and quality of life were assessed in relation to weight and a priori defined successful and unsuccessful post-surgery weight loss. The current study addressed the gap in the literature by bridging the theoretical concepts of social learning theory with bariatric surgery outcomes.

Participants were 92 patients who had gastric bypass surgery in order to lose weight. Of these patients, 79 (85.87%) were female and 13 (14.13%) were male. The majority of the patients (91.5%) were Caucasian with only 8.5% African American. No other ethnicities participated in this investigation. Participants at different periods post surgery (13 months to 8 years) were evaluated with self-report questionnaires. Self-efficacy in relation to eating was assessed by the Weight Efficacy Lifestyle Questionnaire (WEL). Locus of control in relation to eating was assessed by the Dieting Beliefs Scale (DBS). Quality of life was assessed using the Impact of Weight on Quality of Life-Lite Version.

This investigation utilized an ex post facto research design with hypotheses and tests of alternative hypotheses. Multiple Linear Regression and Discriminant Function
Analysis were utilized to test the two research hypotheses tested in this study. All hypotheses were found to be significant. There was a significant relationship between self-efficacy, locus of control, percent excess weight loss and quality of life. The results indicated that percent excess weight loss was a mediating variable in predicting quality of life. Quality of life, self-efficacy, and locus of control significantly differentiated between successful and unsuccessful bariatric surgery group outcomes.

This information may be beneficial to bariatric surgery patients, mental health counselors or other professionals working with the bariatric population and provides groundwork for the development of specific interventions to improve outcomes and adjustment following bariatric surgery.
ACKNOWLEDGEMENTS

I would like to express my gratitude and thanks to the following individuals who have helped me in achieving this research project:

First, to my advisor, Dr. Linda Perosa, for her infinite patience and guidance throughout this project and for supporting me throughout my experience as a doctoral student.

To my committee members: Dr. Sandra Perosa, for her constructive comments and continuous encouragement; Dr. Fred Ziegler, Dr. Cynthia Reynolds and Dr. Suzanne MacDonald, for their strong commitment to research and seeing me through the dissertation process.

To St. Vincent Charity Hospital’s Cleveland Center for Bariatric Surgery patients and staff especially Karen Schultz, R.N., M.S.N., Executive Director, for her support and for allowing me the opportunity to work with CCBS patients.

To Dawn Miller, M.A., C.I.P., Medical Anthropologist, for being an outstanding model of professionalism, for provide unending support in her role as CCBS researcher, and for being a skilled mentor to be for the past 18 months.

To Dr. James Toouli, for allowing me to incorporate his Bariatric Surgery Figures, and to Mr. James Pengrace, Center for Medical Art and Photography
Cleveland Clinic Foundation, for allowing me to incorporate the Bariatric Surgery Outcomes illustration in the dissertation.

To the Dissertation Support Group (DSG) and its members—Amanda Rovnak, Marisa White, Molly Cox, and Gretchen Tucker—for providing unwavering emotional and intellectual support, friendship, inspiration, and motivation, and for keeping me grounded throughout the dissertation process.

Thank you to David Newman for providing statistical insights, contributions, and encouragement, and to Dr. Lisa Fender-Scarr and Roberta Reese for their editorial efforts and expertise.

Last but not least, I offer a special thanks to my family. To John, my husband, son Stephen, brother and sister, Joseph and Chris, I thank you for your endless encouragement, patience, and faith. It would not have been possible to pursue and accomplish my goals without your unconditional love and support.
# TABLE OF CONTENTS

| LIST OF TABLES................................................................. | x |
| LIST OF FIGURES .............................................................. | xi |

## CHAPTER

### I. INTRODUCTION................................................................. 1

- Statement of Purpose................................................................. 10
- Statement of the Problem ............................................................ 11
- Assumptions Underlying the Study ............................................. 12
- Research Questions ........................................................................ 12
- Limitations .................................................................................... 12
- Definition of Terms........................................................................ 13

### II. REVIEW OF THE LITERATURE.................................................. 16

- Introduction.................................................................................... 16
- Psychosocial Influences on Weight Management.......................... 22
  - Self-Efficacy Theory ..................................................................... 22
  - Locus of Control Theory .............................................................. 29
- Surgical Versus Conventional Weight Loss.................................... 40
- Quality of Life and Psychosocial Functioning............................... 45
APPENDIX I. IWQOL-LITE ................................................................. 141
APPENDIX J. LETTERS OF APPROVAL .............................................. 142
APPENDIX K. INSTITUTIONAL REVIEW BOARD APPROVALS ........ 149
APPENDIX L. PARTICIPANT FOLLOW-UP LETTER ........................... 152
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Frequencies</td>
<td>69</td>
</tr>
<tr>
<td>2. Cronbach’s Alpha Internal Reliability Estimates of Instruments</td>
<td>85</td>
</tr>
<tr>
<td>3. Descriptive Statistics</td>
<td>87</td>
</tr>
<tr>
<td>4. Means Disaggregated by Successful Results of Bariatric Surgery</td>
<td>88</td>
</tr>
<tr>
<td>5. Correlations</td>
<td>89</td>
</tr>
<tr>
<td>6. Specific Research Hypothesis 1a-c: The relationship between Self-Efficacy (WEL), Locus of Control (DBS), Percent of Excess Weight Loss (% EWL) and Quality of Life (IWQOL-Lite)</td>
<td>93</td>
</tr>
<tr>
<td>7. Specific Hypothesis 1d: WEL and DBS Account for a Significant Proportion of Unique Variance in Predicting IWQOL-Lite While Controlling for % EWL</td>
<td>94</td>
</tr>
<tr>
<td>8. The Summary of the Canonical Discriminate Function and Wilks’ Lambda</td>
<td>95</td>
</tr>
<tr>
<td>9. Test Equality of Group Means</td>
<td>95</td>
</tr>
<tr>
<td>10. Structure Matrix</td>
<td>96</td>
</tr>
<tr>
<td>11. Classification Results</td>
<td>96</td>
</tr>
<tr>
<td>12. Summary Tables</td>
<td>97</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Modeling relations among locus of control, self-efficacy, weight loss, and quality of life in bariatric surgery patients</td>
</tr>
<tr>
<td>2.</td>
<td>Relationship between successful and unsuccessful bariatric surgery and the discriminating variables</td>
</tr>
<tr>
<td>3.</td>
<td>Modeling relations among locus of control, self-efficacy, weight loss, and quality of life in bariatric surgery patients</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

A large international body of literature underscores the scope of obesity as a public health problem worldwide. Illustrating the hazards posed by morbid obesity, the U.S. Department of Health and Human Services has labeled morbid obesity “the first epidemic of the 21st century” (Grindel & Grindel, 2006, p. 129). Obesity has been identified as a risk factor associated with multiple health risks including Type 2 diabetes mellitus, coronary heart disease, stroke, gallbladder disease, sleep apnea, osteoarthritis, hypertension, hyperlipidemia, hypercholesterolemia, cancer related to the colon, breast and uterus, chronic back and joint pain and over 2.5 million deaths per year (Karmali & Shaffer, 2005; The National Task Force on the Prevention and Treatment of Obesity, 2000; Spence-Jones, 2003).

Bariatric surgery has become increasingly popular as an intervention for morbid obesity. Morbid obesity is generally defined as being 100 pounds or more overweight or having a Body Mass Index (BMI) of over 40 (American Society of Bariatric Surgery, 1998). Minimum surgical requirements set forth for bariatric surgery by the National Institute of Health (1992) include being 100 pounds or more overweight with a BMI of 40 and above or a BMI of 35 and above with one or more obesity-related health conditions including but not limited to diabetes, hypertension, and
cardiovascular conditions (Buchwald et al., 2004). In the United States, approximately 40,000 obesity surgeries were performed in 2000 (Grady, 2000). In 2004, 140,000 obesity surgeries were performed, with weight loss surgery being “one of the most common general surgical procedures” (McCarthy, Arnold, Lamont, Fisher, & Kuhn, 2005, p. 496) with estimates that the number of weight loss procedures will continue to increase annually (Tsao, 2004).

As increasing number of people use bariatric surgery as an intervention for morbid obesity, researchers are beginning to explore the consequences of the operation. The primary benefit of bariatric surgery is weight loss. Many individuals lose between 40% and 75% of their excess body weight, and treatment is considered a success when the patient maintains a 50% loss of excess weight at the 5-year marker and beyond (Choban, Jackson, Poplawski, & Bistolarides, 2002). On average, the mean loss of excessive weight following bariatric surgery is 61.2% for all patients; 47.5% for gastric banding, 61.6% for gastric bypass, 68.2% for gastroplasty and 70.1% for biliopancreatic diversion or duodenal switch (Grindel & Grindel, 2006). Additionally, many researchers contend that bariatric surgery is the only effective treatment for morbid obesity that results in improved obesity-related physical comorbidities and reduced risk of premature death (Brethauer, Chand, & Schauer, 2006; Choban et al., 2002; Flegal, Graubard, Williamson, & Gail, 2005). Buchwald et al. (2004) conducted a meta-analysis of 136 studies of the effects of bariatric surgery and concluded that the procedure reduced excess weight by 61.2%, resolved diabetes in 76.8% of the patients, and improved diabetes in 86.0%. Hyperlipidemia improved in 70% of the patients. Hypertension was resolved in 61.7% of patients and resolved or improved in 78.5%.
Obstructive sleep apnea was resolved in 85.7% of patients and was resolved or improved in 83.6% of patients (see Appendix A).

Although these results are strongly positive, they relate only to physical well-being, less well answered questions are the extent to which bariatric surgery and the subsequent weight loss, improves the psychosocial functioning and quality of life of patients. It would be expected that the dramatic improvement in physical health would be a life-transforming experience for many patients. The overall finding in research is that bariatric surgery has a favorable impact on personal relationships, a marked increase in self-esteem, paralleled by improvements in physical, social, and occupational functioning (Herpertz, Kielmann, Wolf, Senf, & Hebebrand, 2003), self-confidence, and assertion, improvement in social activity and interpersonal relationships, and the alleviation of depression and anxiety (van Gemert, Severeijns, Greve, Groenman, & Soeters, 1998). Although bariatric surgery candidates generally exhibit extremely high levels of physical and psychosocial distress (Herpertz et al., 2003, 2004; Sarwer, Wadden, & Febricatore, 2005), most researchers contend that concerns over negative psychological consequences following surgical weight loss are unwarranted (Herpertz et al., 2003, 2004).

The World Health Organization has encouraged researchers to look at psychosocial health and quality of life issues not just physical changes related to weight loss. The World Health Organization defines health as, “A state of complete physical, mental, and social well-being not merely the absence of disease” (WHOQOL Group, 1998, p.1569). This definition of health helps expand the view of health beyond the focus on illness and the disease process. With the goal of improving
measurement of well being, and the assistance of 15 collaborating centers around the world, the World Health Organization developed two instruments to measure improvement in the quality of life related to health care. The two widely used instruments are the World Health Organization Quality of Life-100 (WHOQOL-100) and the World Health Organization Quality of Life-BREF (WHOQOL-BREF). Over the past decade the terms quality of life and health related quality of life (HRQOL) have been used to refer to the “physical, psychological, and social domains of health, seen as distinct areas that are influenced by a person’s experiences, beliefs, expectations, and perceptions” (Testa & Simonson, 1998, p. 833). Further, the World Health Organization (1998) expands the definition to include the individual’s “perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns” (p. 1572).

Research to date seems to show that health related quality of life (HRQL) improves significantly following bariatric surgery as a result of improvement in, or elimination of comorbid health problems (Kalami & Shaffer, 2005), including improved psychosocial functioning and general quality of life (Dymek, leGrange, Neven, & Alverdy, 2002; Herpertz, et al., 2003, 2004; Fontaine & Barosky, 2001).

One population specific quality of life measure used in research with obese individuals is the Impact of Weight on Quality of Life Questionnaire-Lite Version (IWQOL-LITE) (see Appendix F). This is a validated self-report measure of obesity-specific quality of life. In what they described as the first attempt to objectively document quality-of-life changes among post-bariatric patients, Dymek et al. (2002)
compared four samples of patients: awaiting surgery, 2-4 weeks post-surgery, 6 months post-surgery, and 1 year post-surgery. Dramatic improvements were reported between patients 2-4 weeks out of surgery and 6 months post-operation on depressive symptoms, all eight quality-of-life scales on the SF-36, and Physical Functioning, Sexual Life, Public Distress, and Work Scales on the Impact of Weight on Quality of Life questionnaire (IWQOL) (Dymek et al., 2002). Although there were significant improvements between 6 months and 1 year on quality-of-life indicators, the most dramatic changes occurred between pretest and 6 months. Men and women who undergo bariatric surgery almost invariably experience a marked increase in self-esteem, paralleled by improvements in physical, social, and occupational functioning (Herpertz et al., 2003).

At the same time, it is important to recognize that positive changes after surgery are not uniform. Certain subgroups of patients fail to lose substantial amounts of weight and tend to revert to preoperative levels on quality of life dimensions (Karlsson, Sjostrum, & Sullivan, 1998). Furthermore, the association between weight loss and psychosocial improvement is not necessarily linear (Dymek et al., 2002; Sabbioni et al., 2001). Most studies focus on patients within a relatively short time after surgery. There is some evidence that quality of life outcomes become more divergent over time (Larsen, 2004). Based on these observations, several authors call for deeper investigation into the psychosocial aspects of surgical weight loss (Dymek et al., 2002).

In support of the findings by Dymek et al. (2002), a small qualitative study by Boccheri, Meana, and Fisher (2002) suggested that in addition to the positive physical, social, and psychological changes experienced by post-bariatric patients, they face a
series of dilemmas related to their self-image, identity, and social relationships. For example, many patients thought of themselves as "fatties," even though they had lost a significant portion of weight. For most participants, surgery had a strong positive impact on sexual desire and energy, although in many cases patients' skin had lost its elasticity and some expressed self-consciousness over excess skin, which undermined body image. The narratives indicated that some surgery patients hold weight loss as a panacea for other problems or dissatisfaction they experienced when obese (Bocchieri, et al., 2002).

Another dilemma was raised around social relations. Many post-surgery patients find that they have to master new social situations and relationships. Changes in the way in which others related to the patients raised questions about their motives and their prejudices toward overweight people. An intriguing finding was that some individuals construed having surgery as a sign of failure (Bocchieri et al., 2002); they feared that others would see them as “weak-willed” because they had not been able to lose weight successfully “on their own” (p. 785). This concern reflects the internalization of social stigma related to obesity (Wang, Brownell, & Wadden, 2004). This issue was especially common among participants who had been successful in other areas of their lives and held weight loss to be “their one major achievement failure” (p. 785). Some gradually came to accept their decision for surgery while, “For others, these feelings persisted even after the realization that gastric bypass still demanded Herculean effort and willpower to maintain weight loss” (p. 785). There is no indication in this qualitative study that their feelings actually impeded the ability to maintain a desirable weight.
In the general weight management literature, self-efficacy and locus of control emerge as two factors that are usually linked with more successful weight management (Elfhag & Rossner, 2005; Teixeira, Going, Sardinha, & Lohman, 2005). For example Teixeira et al. conducted an analysis of post 1995 articles focusing on pre-treatment predictors of weight loss following obesity weight loss treatment and identified 38 models predicting weight loss as well as weight maintenance. In their analysis Teixeira et al. (2005) identified “fewer previous weight loss attempts and an autonomous, self-motivated cognitive style” as the best prospective predictors of successful sustained weight loss (p. 43). However, there is some question over how these mechanisms operate. Numerous psychosocial constructs are suggestive of a relationship with weight loss outcome including, but not limited to: treatment outcome expectancies, eating self-efficacy, weight quality of life, and self-esteem. Therefore, the authors suggested that conclusions warrant further study due to the limited research and inconsistent findings.

The concept of self-efficacy is a key element in Bandura’s (1982, 2000) Social Cognitive Theory. Social Cognitive Theory evolved from his research on Social Learning Theory to refocus emphasis on the role of cognitive process in social experience and behavior. Social Cognitive Theory recognizes “an agentic perspective in which individuals are producers of experiences and shaper of events” (Bandura, 2000, p. 75). It is a sense of personal efficacy that is at the core of an individual’s belief that they can influence and affect change in their life and accomplish a specific task or goal. Self-efficacy influences one’s motivation, expectations, affective states, perceptions of abilities, commitment to a course of action, and facilitates coping, goal
setting, and behavioral change (Bandura, 1992, 1997, 2000). Bandura (1986) provided a view of human behavior in which, “what people think, believe, and feel affects how they behave” (p. 25). Self-efficacy beliefs have been empirically established as predictors of health behavior in a wide range of domains (AbuSabha & Achterberg, 1997) “including weight control, nutritional intake, exercise, and smoking cessation” (Berman, 2005, p. 80), as well as cardiac rehabilitation (Gortner & Jenkins, 1990), and addictive behavior (Richman, Loughnan, Droulers, Steinbeck, & Caterson, 2001).

One prospect facing individuals who have had bariatric surgery is maintaining health and successful weight loss. Cognitive processing is at the core of theories of health promotion and weight management. Bandura (2005) expanded on this theme by advocating a social cognitive model of health promotion in which self-regulation is paramount. The factors underlying the model include knowledge of the health risks and advantages of different health practices, self-efficacy perceptions related to control over health behaviors, outcome expectations, health goals people set for themselves and the plans and strategies used to reach them, as well as the perceived sociocultural facilitators and barriers to the desired changes.

According to Rotter’s (1966) Social Learning Theory, locus of control refers to the extent of control individuals perceive they have over the expectancies of reinforcement or outcomes in their lives. The construct suggests that an individual develops and learns generalized expectancies about how their behavior influences reinforcements or outcomes and these expectancies subsequently influence future behavior. Internal versus external locus of control refers to self initiated change orientation (internal) versus change attributed to other initiated change orientation.
Control orientation is assessed via a scale measuring internal versus external (I/E) attribution for the outcomes of events. Persons who possess an internal locus of control orientation believe that the ability to affect outcomes resides within themselves. Consequently, they are prone to take responsibility for their actions and direct personal effort toward achieving desired goals. Conversely, those with an external locus of control orientation attribute outcomes to forces beyond their control. Self-efficacy is the perception of one’s ability to take action whereas locus of control is about outcome beliefs.

Bandura (1997) expounded upon the theoretical differences between locus of control and self-efficacy. Self-efficacy denotes the belief that one can capably execute certain behaviors whereas locus of control is based on the causal relationship between actions and outcomes. The essential distinction lies in whether the focus is on actions or outcomes. In Bandura’s theory, outcome expectations are mediated by self-efficacy beliefs. One can be internally oriented but still lack confidence in the ability to carry out the actions required controlling the outcome of a specific event.

Research on locus of control and self-efficacy in bariatric surgery patients is negligible. Some accounts indicate that obese individuals attribute problems in various aspects of life to their excess weight (Bocchieri et al., 2002; Toth, 2004). After rapid, dramatic weight loss, bariatric surgery patients are confronted with varying degrees of a forced behavior modification, and the reality of taking responsibility for their lives. Behavioral change, therefore, would appear to be facilitated by a personal sense of control, motivation, a belief that one can affect change and take control of one’s life in order to achieve positive, outcomes following bariatric surgery.
Statement of Purpose

Research has shown that perceived self-efficacy, locus of control and bariatric surgery are important factors related to weight loss as well as quality of life. While self-efficacy and quality of life has been empirically related to health behavior, the research on locus of control as a predictive factor has been controversial. Because locus of control is a belief about outcomes, the significance of one’s perception of the ability to influence behavior related to the challenges faced by post-bariatric surgery patients must be examined. Moreover, there have been very few empirical studies relating each of these variables to bariatric surgery outcomes. The majority of research on weight self-efficacy, and weight locus of control have addressed eating behaviors, weight loss and weight loss maintenance in obese and non clinical populations following weight loss treatment, and have not related these constructs to the post-bariatric surgery population. Therefore, some questions left unanswered in the literature are:

1. Is the relationship between the social cognitive variables of self-efficacy and locus of control and quality of life post-bariatric surgery mediated by weight?

2. Are there significant differences in post-bariatric surgery patients between those who lose more than 50% of their excess weight loss goal and those who lose less than 50% of their excess weight loss goal on self-efficacy, locus of control and quality of life?

There is a need for research focusing on cognitive predictors of post-bariatric surgery success. This study will add to the paucity of research focusing on cognitive predictors of post-surgery success, focusing on perceived weight self-efficacy, weight
locus of control and quality of life in a sample of post-bariatric surgery patients. A more complete understanding of the patient’s perceptions of their ability to affect change would be of benefit to patients, mental health professionals, and hospitals to inform treatment and policy change to support successful outcomes for bariatric surgery patients. Additionally, a better understanding of the relationship among these variables with the bariatric population could lead to the development of interventions to improve outcomes and adjustment following surgery.

Statement of the Problem

Morbid obesity has been shown to be a worldwide critical health issue and has been termed the 21st century “epidemic” (Grindel & Grindel, 2006). While much is known about the outcomes of post-bariatric surgery a puzzling issue remains. The majority of patients do appear to achieve remarkable success in mastering the changes to their lives that surgery provides. Yet, there are patients who do not reach all of their expected weight loss goals and outcomes, especially those pertaining to psychological, social and interpersonal factors and improved quality of life (Bocchieri et al., 2002; Karlsson, Sjostrum, & Sullivan, 1998).

Much is known about the importance of self-efficacy, locus of control and quality of life with obese individuals in general, yet how these variables specifically impact bariatric surgery patients is not fully understood. This study will explore whether cognitive variables specified by social cognitive theory and social learning theory add to our understanding of factors associated with successful weight loss and quality of life following bariatric surgery.
Assumptions Underlying the Study

Several assumptions underlie this study: (a) It is assumed that self-reported demographic information and responses are honest and sufficiently free from error; (b) the measurement instruments utilized are appropriate for this population; and (c) all participants will read and fully understand the instructions for completion of the measures.

Research Questions

In particular, several research questions need to be addressed in the research:

1. Is the prediction of quality of life variables as measured by the global score of the IWQOL-Lite, by the social cognitive variables of global weight self-efficacy as measured by the WEL, and weight locus of control as measured by the total score of the DBS mediated by the amount of weight loss post-bariatric surgery?

2. Are there significant differences in post-bariatric surgery patients between those who lose more than 50% of their excess weight loss goal and those who lose less than 50% of their excess weight loss goal on weight self-efficacy (as measured by the WEL total score), weight locus of control (as measured by the DBS total score), and quality of life as measured by the IWQOL-Lite total?

Delimitations

For the purpose of this investigation, the population includes only post-bariatric surgery patients from a Midwest urban hospital that were willing to participate in this research. Characteristics of these participants may be different from those in hospital settings of a different size and location, or from individuals not willing or able to participate in this study. In addition, age of the participants is delimited, as only
individuals over 18 years were included. Additionally, the data are self-report scores based on the Demographic, Weight Efficacy Life-Style, Dieting Beliefs Scale, and Impact of Weight on Quality of Life-Lite questionnaires.

Definitions of Terms

Bariatric surgery is a medical procedure designed to reduce obesity in patients through either restrictive or malabsorptive techniques (National Institutes of Health, 2004). Restrictive surgeries include flexible gastric banding and vertical banded gastroplasty. In the former, a rubber and silicone band is placed around the stomach, creating a small pouch for food and a narrow passage to the rest of the stomach and intestines. In the latter, a band and staples are used to restrict food access to the stomach. Other surgeries combine restrictive and malabsorptive techniques. They include Roux-en-Y gastric bypass (RGB), which is the most common technique, and the Biliopancreatic diversion (BPD). In the RGB technique, the stomach is stapled to form a small pouch at its upper end and a section of the upper intestine is attached to the pouch. In the BPD operation, the lower portion of the stomach is removed and the remainder of the stomach is attached to the lower end of the upper intestine, by passing a large section of the intestine, resulting in lower stomach capacity and reduced absorption. The participants included in the sample had one of the following surgeries: Open Gastric Bypass, Laparoscopic Gastric Bypass or Laparoscopic Banding (see Appendix F).

Body Mass Index (BMI) is a measure used to access the degree of excess weight calculated by dividing one’s weight in kilograms by the square of height in meters.
Excess weight (prior to surgery) will be measured calculating current weight minus the ideal body weight as specified by the Metropolitan Life Insurance tables.

Percent Excess Weight loss (%EWL) will be measured calculating the actual number of pounds lost divided by the excess weight calculated at the time of surgery.

Self-Efficacy is an individual’s belief that they can influence and affect change in their life and accomplish a specific task or goal.

Weight Self-Efficacy. Weight Self-Efficacy is a measure designed to assess self-efficacy for eating control. For the purpose of this research weight self-efficacy will be measured using the Weight Efficacy Lifestyle Questionnaire (WEL) developed by Clark, Abrams, Niaura, Eaton and Rossi (1991). The WEL measures self-efficacy for controlling eating behaviors in a variety of situations (see Appendix D).

Locus of control refers to the extent of control individuals perceive they have over the expectancies of reinforcement or outcomes in their lives.

Weight locus of control is the belief in ability to control weight. In this study weight locus of control will be measured using the Dieting Beliefs Scale (see Appendix E). The Dieting Beliefs Scale is a 16-item questionnaire developed by Stotland and Zuroff (1990) designed to assess beliefs about the ability to control weight. The measure assesses specific expectancies for internal versus external outcome beliefs about weight control. Individuals who have an internal locus of control believe that their own actions determine the outcome reinforcement that they obtain, while those with an external locus of control believe that their own behavior is either not of relevance and that rewards in life are outside of their ability to control. It is made up of three subscales including the Internal Control Over Weight subscale (DBS-Internal),
the Chance, Genetics and Weight Subscale (DBS-External) and the Environment and Weight subscale (DBS-External).

*Quality of life* (QoL) is a construct that refers to the degree of satisfaction experienced in everyday life. For the purposes of this investigation, QOL refers to the perception of obese individuals on the extent to which obesity negatively influences their lives. Life domains include the Personal Functioning subscale, the Self-esteem subscale, the Sexuality subscale, the Public Situations subscale, and the Work subscale. In this study, QoL will be assessed using all scales on the IWQOL-Lite (Kolotkin, Crosby, Kosloski, & Williams, 2001) (see Appendix F).
CHAPTER II
REVIEW OF THE LITERATURE

Introduction

A large international body of literature underscores the scope of obesity as a public health problem. The assessment of overweight and obesity is based on the body mass index (BMI) calculated by dividing one’s weight in kilograms by the square of height in meters. The World Health Organization (WHO) defines overweight as a BMI of 25 to 30 and obesity as a BMI over 30 (Karmali & Shaffer, 2005). Based on these figures, roughly 25% of women and 20% of men in the United States are classified as obese (Bedine, 2003). Some estimates place the prevalence of obesity closer to 30% (Maggard et al., 2005). Morbid obesity is defined as a BMI of 40 or over, or BMI or 35 in conjunction with comorbid conditions (Karmali & Shaffer, 2005). The medical opinion is that morbid obesity can rarely be treated successfully without surgical intervention (Bedine, 2003; Karmali & Shaffer, 2005; Larsen, 2004; Waaddegaard, Clemmesen, & Jess, 2002). The histories of bariatric surgery patients are replete with repeated unsuccessful attempts to control weight (Adami, Ramberti, Weiss, Carlini, Murelli, Scopinaro, 2005; Dymek, leGrange, Neven, & Alverdy, 2002; Karmali & Shaffer, 2005; Larsen, 2004; Tucker, Samo, Rand, & Woodward, 1991).
Bariatric surgery can be traced to the 1950s with observations of the radical weight loss experienced by patients with short-bowel syndrome, which disrupts nutrient absorption (Karmali & Shaffer, 2005). The first gastric bypass was performed in the 1960s (Maggard et al., 2005). With advances in medical technology, surgical procedures have become safer and more sophisticated and prospective patients have several options for surgical management of obesity. The surgical techniques currently used can be divided into two basic categories: (a) techniques that primarily limit stomach size, inducing feelings of satiety, and (b) techniques that act on digestive processes and food absorption (Karmali & Shaffer, 2005). (See Appendix B.)

A large body of evidence confirms that bariatric surgery is superior to conventional weight loss methods for controlling weight in severely obese individuals (Karmali & Shaffer, 2005; Larsen, 2004; Maggard et al., 2005). The magnitude of weight loss is significantly higher after surgical treatment of obesity and data show that weight loss of 20 to 30 kg has been sustained for 10 years or longer (Maggard et al., 2005; Waaddegaard et al., 2002). The loss of one-third of preoperative weight, translating into 55% to 65% of excessive weight, is a typical outcome (Herpertz, Kielmann, Wolf, Senf, & Hebebrand, 2004). Some procedures result in 80% loss of excess weight. The radical changes in weight are accompanied by significant improvement in comorbid medical conditions.

A major criticism of research on bariatric surgery is that the focus is primarily on medical outcomes to the neglect of psychosocial factors in weight management and well-being after surgery (Bocchieri, Meana, & Fisher, 2002; Dymek et al., 2002; Karlsson, Sjostrom, & Sullivan, 1998; Larsen, 2004; Sabbioni et al., 2001). Patients
preparing for bariatric surgery report an array of positive expectations. Many are motivated to begin or increase regular exercise even before surgical weight loss (Bond et al., 2006). Some researchers attribute dramatic increases in physical and psychological well-being in the recovery period to anticipation of a richer and more active lifestyle, free of the guilt, stigma, anxiety, and physical debility associated with extreme obesity (Karlsson et al., 1998; Sabbioni et al., 2001).

Research reviews are useful for gaining an overview of psychosocial influences in bariatric surgery. In general population studies, depression in overweight or obese individuals usually predicts poor success in weight management, particularly for women (Linde et al., 2004). Paradoxically, depression and anxiety before surgery predict favorable outcomes after bariatric surgery (Herpertz et al., 2004). This common finding suggests that psychological distress is more often the result of obesity than the cause, thus it acts as a motivational force for successful weight management after surgical weight reduction (Karlsson, Taft, Torgerson, & Sullivan, 2003). This effect may be attributable to the powerful social stigma associated with obesity. There is ample evidence that obese persons tend to internalize the pervasive “anti-fat” bias that exists in society (Wang, Brownell, & Wadden, 2004). Virtually all studies report a marked rise in self-esteem after surgery (Herpertz et al., 2003).

The intrapersonal benefits of bariatric surgery are paralleled by significant improvements in social functioning in both personal and occupational domains (Herpertz et al., 2003). Most individuals become more active socially as well as physically, and report increased sexual and relationship satisfaction. There are often impressive changes in educational and occupational status, the result of enhanced self-
confidence as well as reductions in medical problems that interfere with work.

Although the psychosocial profiles of bariatric surgery candidates typically show evidence of extreme distress, rising concerns about poor outcomes and negative consequences (Sarwer, Wadden, & Fabricatore, 2005), most researchers contend that concerns over negative psychological consequences following surgical weight loss are unwarranted (Herpertz et al., 2003, 2004). The body of evidence shows that individuals who undergo bariatric surgery experience remarkable improvements in quality of life.

At the same time, it is important to recognize that positive changes after surgery are not uniform. Certain subgroups of patients fail to lose substantial amounts of weight and tend to revert to preoperative levels on quality of life dimensions (Karlsson et al., 1998). The prevalence of eating disorders in severely obese populations is often cited as a concern for the outcomes of weight loss surgery (Herpertz et al., 2003, 2004; Sarwer et al., 2005). The rate of binge eating among prospective surgery patients exceeds 30% (Hsu, Betancourt, & Sullivan, 1996; Hsu et al., 2002; Kalarchian, Wilson, Brolin, & Bradley, 1998; Saunders, Johnson, & Teschner, 1998). Binge eating, body image dissatisfaction, and low self-esteem often interact in morbidly obese men and women, acting as powerful contributors to the decision to undergo bariatric surgery (Grilo, Masheb, Brody, Burke-Martindale, & Rothschild, 2005). Despite the favorable outcomes of surgery and the physiological restrictions imposed by gastric surgery, binge eating does not necessarily abate completely (Hsu et al., 1996). A survey of night eating (starving early in the day with excessive eating in the evening and accompanying distress and/or insomnia) disclosed a rate of 27% among postoperative
bariatric surgery patients compared to 1.5% in a general population sample (Rand, MacGregor, & Stunkard, 1997). Even anorexia nervosa, which seems the antithesis of morbid obesity, occurs in some patients after obesity surgery (Atchison, Wade, Higgins, & Slavotinek, 1998).

Saunders et al. (1998) stated that bariatric surgery candidates should be evaluated for eating disorders before surgery so that a comprehensive treatment plan can be formulated to facilitate weight maintenance following surgery. Adami et al. (1994) used the Eating Disorder Inventory (EDI) to assess two groups of patients undergoing biliopancreatic surgery. One group was evaluated prior to surgery and the other had completed surgery from 2 to 11 years earlier. For further comparison, the authors selected a matched control group. The EDI consists of 10 subscales: Drive for Thinness, Interoceptive Awareness, Bulimia, Body Dissatisfaction, Ineffectiveness, Maturity Fears, Perfectionism, and Interpersonal Distrust.

Compared to normal controls, the obese participants exhibited elevated scores on the EDI, particularly in the area of body dissatisfaction (Adami et al., 1994). Body dissatisfaction seems to exert a strong influence on the decision to undergo surgery (Grilo et al., 2005). Adami et al. (1994) divided the post-surgery patients into those who were weight-preoccupied and those who were not weight-preoccupied. Relatively few participants fell into the first category. Their scores on body dissatisfaction did not differ significantly from the obese participants and their overall psychological profile was consistent with eating disorders. In contrast, the non-weight preoccupied participants, who represented the majority of post-surgery patients, had EDI scores in the same range as lean individuals. The findings supported the assumption that there
are different subgroups of bariatric surgery patients who may require different types of support.

Furthermore, the association between weight loss and psychosocial improvement is not necessarily linear (Dymek et al., 2002; Sabbioni et al., 2001). Most studies focus on patients within a relatively short time after surgery. There is some evidence that quality of life outcomes become more divergent over time (Larsen, 2004). Based on these observations, several authors call for deeper investigation into the psychosocial aspects of surgical weight loss (Dymek et al., 2002).

In the context of bariatric surgery, the preexistence of a severe psychiatric disorder appears to be the only predictor of poor outcomes (Herpertz et al., 2004). In the general weight management literature, self-efficacy and locus of control emerge as two factors that are usually linked with more successful weight management (Elfhag & Rossner, 2005; Teixeira, Going, Sardinha, and Lohman, 2005). However, there is some question over how these mechanisms operate. Additionally, most research is conducted with dieters whose success is contingent on the ability to control eating behavior. Self-efficacy develops as a result of mastery experiences (Bandura, 1986, 1997). Bariatric surgery patients have a history of failed weight loss attempts, followed by an immense reduction in excess weight. Based on existing research, it seems inevitable that self-efficacy should play a role in the long-term maintenance of weight loss after surgery, yet there is limited exploration of this issue.

Compared to self-efficacy, which is task specific and conducive to change (Bandura, 1986, 1997), locus of control is thought to be more stable and less malleable. However, attributions for control are not necessarily consistent across situations
Effective weight management programs are structured to promote self-efficacy and help participants take responsibility for their eating behavior (Nirs & Neumann, 1991, 1995; Reicks, Mills, & Henry, 2004). Some researchers argued that locus of control does not predict weight control outcomes per se, but rather the type of supports or structures that will best facilitate successful outcomes (Lefcort, 1984; Neumann, 1995; Wallston, Wallston, Kaplan, & Maides, 1976). Research on locus of control in bariatric surgery patients is negligible.

Psychosocial Influences on Weight Management

The following sections examine self-efficacy and locus of control theory as psychosocial influences on weight control. In addition, the weight locus of control, weight self-efficacy, and surgical versus conventional weight loss literature will be reviewed.

Self-Efficacy Theory

Perceived self-efficacy is defined as “people’s judgments of their capabilities to organize and execute courses of action required to attain designated levels of performance” (Bandura, 1986, p. 391). According to Bandura (1986, 1997), self-efficacy beliefs play a central role in thoughts, motivations, and actions. Individuals who are confident in their ability to achieve their desired aims set high goals and strive hard to achieve them. Difficulties are construed as challenges that can be surmounted through personal effort. Confronted with obstacles, they are likely to reinforce their efforts. In contrast, individuals with low perceived self-efficacy tend to avoid difficult tasks. They show less determination and tend to see setbacks as evidence of personal weakness.
There are four key sources of self-efficacy perceptions (Bandura, 1986, 1997). The most powerful influence on self-efficacy is *mastery experience*, which implies that success is derived from persisting through challenges rather than relying on easy goals. Bandura states that individuals who rely on easy goals to attain success can easily be discouraged when confronted with failure. Persevering in the face of obstacles builds a *resilient* sense of self-efficacy.

A second influence on self-efficacy is vicarious learning or *modeling*. Bandura (1986, 1997) stresses that the effectiveness of modeling is enhanced by perceived similarities to the model. A third source of self-efficacy is *social persuasion*, which encompasses positive feedback, encouragement, and support for effort. For maximum effect, the encouragement must be realistic and take place within the context of an experience that will probably lead to success. Verbal encouragement can be particularly effective when success is defined in terms of personal self-improvement goals as opposed to competition with others.

The fourth source of self-efficacy is the individual’s somatic and emotional states (Bandura, 1986, 1997). Stress, tension, anxiety, and depression undermine self-efficacy while positive mood, energy, and enthusiasm amplify it. The relationship is bi-directional. Confident in their capabilities, individuals with high self-efficacy embark on activities with energy and enthusiasm. For individuals lacking self-efficacy, the same activities may seem stressful or intimidating.

Experiences that have an enduring impact on self-efficacy involve directing efforts toward the achievement of challenging but realistic goals. As conceived by Bandura (1986), self-efficacy is domain specific. Firmly entrenched, high self-efficacy
perceptions can extend to other situations, providing they are similar in character to the experiences upon which the efficacy beliefs are built. Bandura considers self-efficacy beliefs to be a stronger predictor of future experiences than past achievements, as the four sources of self-efficacy influence the establishment and achievement of future aims.

The domain specific nature of self-efficacy distinguishes it from self-esteem. Bandura (1986) defines self-esteem as the way an individual regards the self, including feelings of self-respect and self-acceptance. In essence, self-efficacy refers to appraisals of personal capabilities whereas self-esteem is concerned with appraisals of self-worth. Whether self-efficacy in a given situation affects self-esteem generally depends upon how important the task is to the person and whether it is connected with the sense of self. An impressive body of research, much of it in the field of health psychology, confirms that high self-efficacy is associated with intentions to alter behavior and actions directed toward achieving behavioral goals (Bandura, 1997).

*Weight self-efficacy.* Bandura’s (1986, 1997) conceptualization of self-efficacy has generated the development of self-efficacy scales in a variety of task domains. The 20-item Weight Efficacy Lifestyle Questionnaire (WEL) was designed to assess eating patterns and attitudes and is used in research with overweight or obese subjects (Richman, Loughnan, Droulers, Steinbeck, & Caterson, 2001). The scale is divided into five dimensions encompassing negative emotions, availability, social pressure, physical discomfort, and positive activities. Participants are given 20 situations and asked to rate their confidence in resisting the desire to eat in each one. The WEL is
utilized as a both a general screening tool and a guide for assessing strengths and weaknesses of cognitive behavioral mechanisms related to control over eating.

Richman et al. (2001) applied the WEL to a study of 161 overweight (BMI 27-30) and 138 obese (BMI > 30) women attending a hospital weight management clinic. All participants were enrolled in a 3-month behavior management program although they had different options for consultation and support. Obese participants had access to specialist weight management care, while overweight clients could choose from other options. The results showed the program to be equally effective whether the clients were supervised by a general practitioner, attended group sessions, or preferred to follow a self-directed program. Weight and self-efficacy perceptions both improved over the course of the program, reflecting the role that mastery experiences play in enhancing self-efficacy (Bandura, 1986, 1997).

Richman et al. (2001) acknowledged that although the average weight loss was not high it was clinically significant. Attrition was high, with slightly fewer than half the original participants completing the 3-month program and only 20% extending participation beyond three months. Richman et al. (2001) implicated decreased supervision in the later stages of the program, stating that, in view of general consensus that obesity should be treated as a chronic disease; long-term commitment should be requisite on the part of clients and health professionals alike. Verheijden, Bakx, van Weel, Koelen, and van Staveren (2005) argued that social support, whether provided by professionals or peers, should be part of all lifestyle interventions for long-term weight management. According to Richman et al. (2001), the optimal strategy is to facilitate self-management while providing adequate support.
The obese women entered the program with lower confidence in their ability to lose weight than their less overweight peers (Richman et al., 2001). However, initial levels of self-efficacy were not related to program completion or to the amount of weight lost. Research findings are inconsistent in this area. The most significant effect, reported by several studies, is that weight loss interventions have the power to enhance self-efficacy, thereby resulting in better outcomes (Elfhag & Rossner, 2004). Richman et al. (2001) observed this phenomenon, noting that the participants scored significantly higher on all five WEL dimensions at the 3-month assessment. In fact, the gains were impressive, and the self-efficacy perceptions of women who completed the 3-month program proved similar to those for normal weight populations. In addition, self-efficacy related to food was sustained for a full year.

A strong sense of self-efficacy is associated with the adoption of self-regulation strategies (Bandura, 1986, 1997). Kitsantas (2000) examined the impact of perceived self-efficacy and self-regulation techniques on successful weight control. Three major self-regulation strategies are strategic goal setting, self-monitoring, and self-evaluation. Setting realistic but attainable goals is an important contributor to self-efficacy. Bandura (1986, 1997) emphasized that focusing on an ideal goal almost inevitably leads to failure whereas setting incrementally higher goals within the context of experiences designed to promote success builds confidence. Obese individuals frequently enter weight loss programs with unrealistically optimistic expectations (Teixeira et al., 2004). Studies show that they are more likely to drop out of treatment than reach their goals.
Self-monitoring refers to paying deliberate attention to certain behaviors, in the case of dieting, behaviors related to food intake (Kitsantas, 2000). Although sometimes used interchangeably with self-monitoring, self-evaluation refers to performance appraisal such as reaching milestones in changes in weight and BMI. Additional self-regulation techniques include seeking out information, seeking social support, altering one’s environment, and time management.

The participants were 33 undergraduate students divided into three groups: students who had no histories of weight problems, students who had been obese for at least 6 years and unsuccessfully attempted to lose weight for at least 6 months, and formerly obese students who had lost 30 pounds or more and kept the weight off for at least 6 months (Kitsantas, 2000).

The three groups of students differed considerably in terms of reliance of self-regulatory techniques (Kitsantas, 2000). The use of self-regulatory strategies was significantly higher in participants who had no weight control problems or had successfully lost weight compared to the unsuccessful dieters. In fact, the healthy weight and previously overweight groups were quite similar to one another despite their differing weight histories, indicating that the previously overweight participants had effectively deployed self-regulatory strategies to achieve and maintain their current weight. This was evident in their self-efficacy perceptions. Both the healthy weight and previously overweight students expressed confidence in their ability to apply goal setting, self-monitoring, self-evaluation, and time management techniques, as well as to seek information and social assistance when confronted with challenges. Overall, there was a strong correlation between self-regulation strategies, self-efficacy, and
satisfaction with weight. Consistent with Bandura’s (1986) theory, self-efficacy perceptions played a key role in weight loss and maintenance. Participants with low self-efficacy failed to engage in self-regulation strategies that are an essential component of an effective weight management regime (Kitsantas, 2000).

Linde et al. (2004) explored binge eating, depression, and self-efficacy in a sample of 1,632 overweight men and women with an average BMI of 34.2. The respondents were recruited from a large management care organization for participation in weight loss intervention. Roughly 21% of the men and 27% of the women reported engaging in binge eating, which reflects the low end of prevalence estimates among obese individuals seeking treatment (23% to 55%). The prevalence of depression (using antidepressant drugs as a proxy), 16% for men and 30% for women was consistent with gender-related rates of depression among obese adults. Self-efficacy scores were also congruent with other studies of similar populations.

Overall, women were more prone to binge eating and depression than men and were less confident in their ability to lose weight. The most striking finding was the powerful role of depression in impeding successful weight loss for women (Linde et al., 2004). Women taking antidepressant drugs lost less than half the amount of weight than women who were not similarly depressed. Another notable finding was that psychosocial factors were much more strongly related to weight loss in women than men. At the same time, Linde et al. (2004) conceded that the low proportion of men in the survey might have attenuated the power of binge eating, depression, and self-efficacy to predict weight loss in men.
In a community sample of 219 men and women, two specific aspects of eating self-efficacy were significantly linked with symptoms of eating disorders (Berman, 2006). Lack of confidence in one’s ability to control eating behavior when confronted with negative emotions was associated with greater preoccupation with weight and bulimic tendencies. Additionally, lack of confidence in the ability to control eating when ample food was available was linked with feelings of ineffectiveness. The Weigh Down Workshop program described by Reicks et al. (2004) is structured to raise participants’ awareness of issues such as emotional eating and inability to restrain eating when food is available and help them acquire self-control strategies. In fact, the findings of Kitsantas (2000) illustrated the need for embedding strategies to raise self-efficacy and promote the use of self-regulation techniques in a weight management program.

**Locus of Control Theory**

According to Rotter’s (1966) social learning theory, locus of control refers to the extent of control individuals believe they have over the course of their lives. Control orientation is assessed via a scale measuring internal versus external (I/E) attribution for the outcomes of events. Persons who possess an internal locus of control orientation believe that the ability to affect outcomes resides within themselves. Consequently, they are prone to take responsibility for their actions and direct personal effort toward achieving desired goals. Conversely, those with an external locus of control orientation attribute outcomes to forces beyond their control.

Lefcort (1984) referred to internally oriented individuals as “controllers,” stating that they desire to feel a sense of mastery and dominance over the situations
they undertake. Lefcort’s terminology inevitably invokes Bandura’s concept of self-efficacy. Bandura (1997) expounded upon the theoretical differences between locus of control and self-efficacy. Self-efficacy denotes the belief that one can capably execute certain behaviors whereas locus of control is based on the causal relationship between actions and outcomes. The essential distinction lies in whether the focus is on actions or outcomes. In Bandura’s theory, outcome expectations are mediated by self-efficacy beliefs. One can be internally oriented but still lack confidence in the ability to carry out the actions required to control the outcome of a specific event.

Locus of control. In the context of weight loss, social persuasion can be a crucial element for bolstering self-efficacy in individuals who are externally oriented (Nir & Neumann, 1995). Drawing on Lefcort (1984), Nir and Neumann (1995) suggested that the structure of formal weight loss programs in which participants rely on support from counselors, instructors, and peers may advantage participants with an external orientation while reducing the motivation of those who prefer to be in control. Nir and Neumann propose this as explanation for the inconsistent relationship observed between weight loss and locus of control in research, including the authors’ own studies (Nir & Neumann, 1991, 1995). That assumption is supported by an early study conducted by Wallston et al. (1976), who developed the Health Locus of Control (HLC) scale. Applying the HLC, Wallston et al. found that participants in a weight loss program that matched their locus on control orientation (that is, a self-directed program for those who were internally oriented and a group program for those with external orientation) reported higher satisfaction with the program and tended to lose more weight than those whose preferences were incongruent with the program design.
Richman et al. (2001) credit the flexibility of the weight loss clinic with facilitating successful outcomes. Clients are free to choose more or less support and structure, as they prefer.

Unlike Bandura’s (1986, 1997) formulation of self-efficacy, Rotter’s (1966) locus of control theory is not situation specific. In later work, however, Rotter (1975) contended that a more specific measure of locus of control would have superior predictive power for assessing causal expectancies within a particular context than a general measure. This idea underlies the development of the HLC (Wallston et al., 1976) and the more sophisticated Multidimensional Health Locus of Control (MHLC) scales subsequently created by Wallston and colleagues. The MHLC is comprised of three separate scales: the Internal Health Locus of Control (IHLC) Scale, the Chance Health Locus of Control (CHLC) scale, and the Powerful Others Health Locus of Control (PHLC) scale (Saltzer, 1982).

Building on Rotter’s (1975) call for greater specificity, Saltzer (1982) proposed that an instrument designed to assess weight locus of control would have practical public health benefits. Saltzer validated the Weight Locus of Control (WLOC) scale in two independent studies. The first study applied the WLOC to the intentions of college students toward losing weight, while the second study focused on women embarking upon a medical weight loss program.

The WLOC effectively distinguished internally oriented from externally oriented participants in the college student sample (Saltzer, 1982). Internally oriented students were motivated to lose weight by their personal attitudes whereas social pressure was the dominant factor for their externally oriented peers (Saltzer, 1982). As
Rotter (1975) anticipated, the context specific instrument captured incremental differences in locus of control related to weight loss more efficiently than either the HLC or MHLC scales. In the sample of women beginning a weight loss program, participants classified as internal according to the WLOC were more likely to complete the full 6-week program, whereas none of the three MHLC subscales predicted program completion (Saltzer, 1982).

Among program completers, internally oriented participants showed somewhat greater success in reaching their original weight loss goals; although Saltzer (1982) acknowledged that the significance was marginal. However, the distinction increased among those participants who awarded high value to either health or physical appearance. Internally oriented participants with either preference were much more successful in achieving their desired weight loss than externally oriented participants who similarly valued appearance or health. Saltzer emphasized the importance of physical appearance, which is unique to the WLOC, for many program participants.

Kincey (1981) used the broad measure of locus of control to examine weight loss in a sample of women involved in a behavioral weight loss program. All were at least 10% over the average weight for their age and height. An intriguing finding was the changing relationship of locus of control to weight loss at different points of the program. In the early stages, locus of control had no impact on weight loss. However, from 8 weeks onward, internal locus of control proved an advantage in striving toward desired weight loss goals. At 15 weeks, the average weight loss for internally oriented participants was 16.21 lb, compared to 9.84 lb for externally oriented participants. At the same time, the dropout rate was high and the 15-week follow-up consisted of only
33 of the original 131 entrants. Kincey found no correlation between locus of control and program completion, which only surfaced in Saltzer’s (1982) study through the use of the WLOC.

The Dieting Belief Scale (DBS) of Stotland and Zuroff is another specific instrument devised to assess the extent one believes that weight is controllable (Paxton & Sculthorpe, 1999). The three subscales encompass Internal Control Over Weight; Chance, Genetics, and Weight; and Environment and Weight. Chance and Environment roughly correspond to the Chance and Powerful Others subscales of the MLC, although they are simultaneously broader in scope and specifically related to weight control. The DBS was originally validated on university students. Modifying a few items to make it more applicable to an adult sample, Paxton and Sculthorpe investigated weight loss locus of control in a socioeconomically diverse sample of 994 Melbourne adults. The MHLC was used to appraise more general health beliefs. BMI was calculated from the respondents’ self-reported height and weight, with BMI exceeding 25 classified as overweight or obese. All respondents disclosed whether they dieted within the past year.

Demographically, more affluent respondents placed less importance on chance or environment for weight control (Paxton & Sculthorpe, 1999). There was no effect for gender per se; with BMI factored in, however, heavier women were more likely to attribute weight control to chance or genetics than heavier men. In general, heavier respondents attributed weight to both internal control and environmental influences (such as being surrounded by high calorie food) and social support. Paxton and Sculthorpe suggest the somewhat paradoxical finding may be due to greater sensitivity
on the part of overweight individuals to “media messages promoting individual dieting
techniques and self-blame but at the same time awareness of the strength of
environmental pressures” (p. 427). Overweight respondents expressed less confidence
in their ability to lose weight if they desired, although based on the overall results, the
researchers surmised that many community members placed excessive emphasis on
self-control and downgraded the impact of biological factors in weight. The belief that
weight depends entirely on personal willpower and self-control underlies much of the
stigma attached to obesity (Wang et al., 2004).

Health beliefs were unrelated to whether or not the respondents had recently
dieted. Paxton and Sculthorpe (1999) speculated that despite the health care
profession’s conceptualization of weight loss as a health issue for overweight
individuals, members of the general community might not share their focus on health.
The powerful role of appearance as a motivator for many women in Saltzer’s (1982)
study supports that assumption. Weight loss self-efficacy was highest among
individuals who had recently lost more than 6 kg, leading Paxton and Sculthorpe
(1999) to propose that, “Previous weight loss experiences may alter health beliefs,
depending upon the outcome” (p. 429). They concluded that beliefs play a role in
successful weight loss, “but may also be the result of the encouraging experience rather
than a cause for it” (p. 429). This idea is consistent with Bandura’s (1986, 1997)
theory and is supported by research affirming that participating in a weight loss
program enhances self-efficacy (Elfhag & Rossner, 2005).

Lefcort (1984) portrayed internally oriented individuals as driven by a strong
desire to be in control, whose motivation to lose weight is undermined by a formal
program that stresses the influence of professionals and peers. Adolfsson, Andersson, Elofsson, Rossner, and Unden (2005) perceive the ideal weight loss program candidates as individuals with a balanced locus of control, which enables them to believe that weight loss is under their control yet leaves them amenable to the guidance of health professionals. The researchers explored locus of control and weight loss in 24 women and 17 men involved in a 2-year group weight control program at a Stockholm university hospital. The average BMI at baseline was 41.2. Of the original 41 participants, 28 completed 1 year.

According to Adolfsson et al. (2005), weight loss of 5%-10% is considered clinically successful. The mean weight reduction among participants was 6%, accompanied by a significant decrease in obesity-related medical risks. Compared to a control group, the obese program participants displayed significantly higher external locus of control orientation. Within the group, internally oriented participants experienced significantly greater weight reduction than those with external orientation. As in other studies (Kincey, 1981; Richman et al., 2001), the dropout rate was high, a perennial problem in weight loss interventions. The difference in weight loss between internally and externally oriented participants observed by Adolfsson et al. (2005) is also consistent with Kincey’s (1981) findings. At the same time, there were no differences in locus of control orientation between program dropouts and persisters. Given the disproportionate representation of externality among obese individuals and the advantage of internal locus of control for weight reduction, Adolfsson et al. (2005) recommend that weight control programs employ an empowerment approach that encourages and reinforces participants’ internal orientation, bolstering their confidence
to make behavioral changes and assume responsibility for treatment outcomes. From Bandura’s (1986, 1997) perspective, such a program would focus on the four sources of self-efficacy.

The research of Nir and Neumann (1991, 1995) focused on the dual attributes of self-esteem and locus of control in weight loss. The first study involved 116 moderately obese women participating in a 10-week dietary and behavioral weight reduction program, and the later study followed 66 women 15 to 47 months after the program’s end. The program was based on Orem’s Self-Care Deficit Theory, which facilitates behavior change by helping participants acquire knowledge, capabilities, motivation, and behavioral skills in the target area, in this case, diet and nutrition (Nir & Neumann, 1991). The aim of the program is to empower participants to take control of their weight.

While involved with the program, participants with internal locus of control orientation lost more weight, although the difference did not reach statistical significance (Nir & Neumann, 1991). However, reflecting the findings of prior studies (Kincey, 1981; Lefcort, 1984), the distinction became more pronounced over time. Internally oriented women adhered to the regimen for 12.3 months, compared to 7.5 months for externals, and remained in control of their weight for 29 months. The impact of the program attenuated at 30 months onward for all participants, although internals persisted longer.

Nir and Neumann (1991) observed an interesting interplay between locus of control and marital status. Among externally oriented participants, married women lost more weight than single women, which reflects the idea that support from significant
others plays an important role in the goal attainment of persons with external locus of control. In contrast, internally oriented single women lost more weight than their married counterparts, leading Nir and Neumann to suppose that internal married women might “lose some of their autonomy by being married” (p. 574).

While it was not unexpected that participants with low self-esteem would have difficulty losing weight, an unanticipated finding was that the most successful weight loss was observed in participants with medium levels of self-esteem as well as high self-esteem (Nir & Neumann, 1991). Nir and Neumann suggest that given the link between self-esteem and body image, women whose self-esteem was compromised by their excess weight might have been motivated to lose more weight by concerns over body image. They attribute the successful weight loss of women with high self-esteem to the positive perceptions of self, adaptability, optimism, and persistence toward personal goals associated with a strong sense of self. This depiction of self-esteem illustrates the interrelationship between self-esteem and self-efficacy in the context of an endeavor that one holds in high value (Bandura, 1986, 1997).

In the specific context of weight loss, Nir and Neumann (1991) raised the issue of guilt in relation to overeating. Setbacks are endemic in weight loss programs. Nir and Neumann propose that individuals with low self-esteem might use food to compensate for guilt feelings whereas those with high self-esteem do not experience guilt and have greater resources for coping with setbacks. The researchers noted that the weight loss trajectories of women with low self-esteem showed marked fluctuations over the course of the program.
Self-esteem played an equally important role in weight maintenance (Nir & Neumann, 1995). Low self-esteem and external locus of control both predicted lower dietary persistence and limited success in maintaining weight loss. On average, women with high, medium, and low self-esteem gained back 1.7 kg, 2.6 kg, and 3.5 kg, respectively. The average weight gain was 1.8 kg for internally oriented participants and 3.4 kg for externals. Based on the patterns that emerged, Nir and Neumann (1995) proposed that individuals with low self-esteem and/or external locus of control require more encouragement within the context of extended programs that provide time and support for developing the requisite self-control for altering eating behavior. On the other hand, individuals with high self-esteem and/or internal orientation need to become aware that accepting advice and assistance from others would benefit them in their achieving the goal of successful behavior change.

Reicks et al. (2004) examined self-efficacy and locus of control beliefs within the context of the spiritually oriented Weigh Down Workshop program. Participants are taught to identify signs of genuine physiological hunger and consume a regular diet with control. The program consists of 12 weekly sessions that synthesize psycho-education with bible study, prayer, and discussion. The qualitative study was comprised of 32 women in five focus groups.

Most participants stated that the program effectively taught them to recognize hunger signals, resulting in significant changes in eating habits (Reicks et al., 2004). Lack of awareness of their previous patterns appeared to be a key factor in their weight problems and they welcomed the changes that occurred. Consistent with other research (Elfhag & Rossner, 2005), the Weigh Down participants expressed much greater
confidence in their ability to control their weight (Reicks, Mills, & Henry, 2004). They targeted several elements of the program that reflect the influences on self-efficacy outlined by Bandura (1986, 1997). These include support and encouragement from other members, testimonials by women who had successfully lost weight, reinforcement for successful weight loss, and a simple program design that promoted ease and comfort and allayed anxiety over eating behavior (Reicks et al., 2004). In fact, Reicks et al. emphasized how the program effectively boosted self-efficacy.

The narratives of the participants indicated that most believed that they were responsible for control over their weight (Reicks et al., 2004). Self-discipline and willpower were predominant themes and several women related that the program helped them to realize that it was up to them to assume control over eating. Some admitted they had previously attributed their weight problems to genetics, family influences, or external events. However, they came to recognize that success came from taking responsibility for their actions.

For most participants, expectation that they would feel better after losing weight was the main motivator for joining the program (Reicks et al., 2004). They described a plethora of positive outcomes including successful weight loss, increased mobility and energy, feelings of freedom from guilt and worry about food, heightened spirituality, closer relationships with family members, knowledge they could transmit to their children, less judgmental attitudes toward overweight people, and a sense of belonging with other group members.

Since the study was qualitative in design, there is no data on the self-efficacy perceptions or locus of control orientation of the participants prior to joining Weigh
Down. However, the narratives imply that many women entered the program with low levels of weight self-efficacy and external orientation, which were positively impacted by an effective program design. Research suggests that self-efficacy is more likely to be an outcome than a predictor of successful weight loss (Elfhag & Rossner, 2005). At the same time, the reinforcement of self-efficacy beliefs may be a powerful factor in weight maintenance.

Based on an extensive research review, Teixeira et al. (2005) concluded that autonomy and self-motivation, which reflect internal locus of control orientation, and few prior attempts at weight loss, are the strongest predictors of successful weight management. In the same way that mastery experiences enhance self-efficacy perceptions, repeated experience of failure work to undermine them (Bandura, 1986, 1997). This effect may explain why fewer weight loss attempts are related to more successful weight management. Individuals who seek bariatric surgery typically have histories of unsuccessful dieting (Adami et al., 2005; Bocchieri et al., 2002; Dymek et al., 2002; Karmali & Shaffer, 2005; Tucker et al., 1991). Higher BMI at the onset of intervention is associated with greater weight loss in absolute pounds (Teixeira et al., 2005). However, weight loss alone is insufficient for explaining improvements in psychosocial and physical functioning after surgery (Dymek et al., 2002; Sabbioni et al., 2002).

*Surgical Versus Conventional Weight Loss*

Bariatric surgery candidates typically display extremely high levels of physical and psychosocial distress (Herpertz et al., 2003, 2004; Sarwer et al., 2005). Some research has explored the characteristics of obese adults who seek medical intervention
for weight loss compared to those who select more conventional interventions. The study of Higgs et al. (1997) involved 18 women and two men enrolled in a hospital obesity clinic and 14 women and 4 men attending weight watchers. None of the hospital group had undergone surgery although four were contemplating having gastric stapling. The other 16 sought dietary supervision, prescribed appetite suppressants, and counseling. All participants in both settings had BMI exceeding 30.

The hospital group exhibited significantly higher levels of psychological distress than the Weight Watchers group. In fact, Higgs et al. (1997) observed that the psychological profile of the clinic participants was comparable to distress found in psychiatric outpatients whereas there was little difference between the Weight Watchers group and a non-obese community sample. The most pronounced differences were in anxiety and somatization. The researchers noted that there is some suggestion that somatization is actually an anxiety disorder manifest in terms of health anxiety. The hospital group was also significantly more depressed than the Weight Watchers group although both groups displayed more depression than a non-obese community sample. Depression is endemic in obese individuals (Elfhag & Rossner, 2005).

There was no difference in locus of control between participants in the two settings despite the greater distress in the hospital clients and their seeking out more intensive support (Higgs et al., 1997). Of all the factors explored, somatization and BMI emerged as the most powerful influences on seeking medical intervention, suggesting that, “the greater the amount of weight carried, the greater are the unpleasant consequences for the individual” which leads them toward more intensive
or “extreme” interventions for weight control (p. 403). Obesity research systematically supports that assumption (Fontaine & Barofsky, 2001; Herpertz et al., 2003, 2004; Karlsson et al., 1998; Karmali & Shaffer, 2005; Kolotkin et al., 2002; Maggard et al., 2005; Sarwer et al., 2005).

Self-efficacy plays a key role in coping and anxiety, which are related to threat appraisal (Bandura, 1986). Persons who are confident in their coping ability are less prone to succumbing to stress and anxiety when faced with challenges. Ryden et al., (2001) noted that despite the attention given to obesity, few researchers have examined how individuals cope with problems related specifically to obesity. The data were drawn from the Swedish Obese Subjects (SOS) study. Since its inception in 1987, the SOS has been recruiting severely obese adults for participation in a clinical trial investigating the impact of long-term weight reduction on quality of life, morbidity, and mortality (Karlsson et al., 1998). Two matched groups of patients, electing either surgery (gastric banding, vertical banded gastroplasty, or gastric bypass) or conventional weight loss treatment are monitored over 10 years. Ryden et al. (2001) compared coping and distress in obese adults who chose different methods, including surgery, for weight reduction, using baseline data taken from 2,510 SOS intervention participants.

Coping strategies are typically conceived in terms of problem-focused and emotion-focused coping (Ryden et al., 2001). Problem-focused coping involves directly confronting the source of stress or using cognitive restructuring to minimize its impact. Problem-focused strategies are associated with high coping self-efficacy (Bandura, 1986, 1997). Emotion-focused coping implies attempting to minimize stress
through escape, self-preoccupation, or emotional regulation. Ryden et al. (2001) focused on three coping mechanisms: Social Trust, Fighting Spirit, and Wishful Thinking. They emphasize that social trust is not synonymous with social support, defining social support as “the availability and the quality of social relationships between individuals” (p. 185). Social trust is a problem-focused coping strategy referring to perceptions that one can mobilize others to assist with solving problems. Fighting spirit refers to determination to work through challenges and optimism that there are ways that problems can be resolved. Wishful thinking, in contrast, is an emotion-focused strategy that does not necessitate action.

Surgical candidates showed greater predisposition toward emotion-focused coping than problem-focused coping compared to individuals who sought more conventional methods to lose weight (Ryden et al., 2001). Consistent with the findings of Higgs et al. (1997), the surgical candidates reported higher levels of psychological distress (Ryden et al., 2001). Ryden et al. attributed the distinction to the higher levels of wishful thinking and lower levels of social trust and fighting spirit among the surgical candidates. Intrusion and Helplessness were the key mechanisms underlying the distinction. Intrusion in this study referred to the adverse impact of obesity in one’s daily life and consequent preoccupation. Helplessness was conceptualized in the broad sense of overwhelming perceptions that one’s life is out of control. Although Higgs et al., (1997) did not explore self-efficacy or locus of control directly, conventional weight loss candidates used adaptive coping strategies associated with high coping strategies, whereas surgical candidates relied on maladaptive candidates and did not feel their problems were within their control.
Nir and Neumann (1995) emphasize the importance of successful weight maintenance following intervention and the difficulty involved even for individuals with high self-esteem and perceptions of control. The focus of Klem et al. (2000) was success in maintaining weight loss among individuals who lost weight via surgery or non-surgical methods. The data were drawn from the National Weight Control Registry (NWCR), a longitudinal study of successful long-term weight maintenance, and included 67 subjects who had undergone bariatric surgery and 67 who had lost weight through a variety of non-surgical means. The study explored psychosocial factors and eating behavior as well as weight regulation.

An interesting pattern emerged. There were no psychosocial differences between the weight loss groups, however, participants in each group relied on different strategies to maintain their weight (Klem et al., 2000). The diet of surgical patients was significantly higher in fat and lower in carbohydrates and protein. Additionally, surgical patients were less likely to engage in physical exercise. The dietary distinction may reflect the “dumping syndrome” sometimes resulting from gastric surgery, in which ingesting large quantities of carbohydrates causes unpleasant physical side effects. Low carbohydrate intake, in turn, depresses energy levels, which could translate into less inclination for physical exercise. It has also been theorized that surgery can also cause metabolic changes that allow for high fat consumption without gaining weight.

Regardless of how they lost excess weight, participants in both groups were equally successful in regulating their weight (Klem et al., 2000). They reported significant positive changes in mood, self-confidence, quality of life, work
performance, relationships with family and friends, and time spent in enjoyable hobbies. Some 25% of participants acknowledged greater preoccupation with weight, which was not related to mode of weight loss. However, any negative effects were clearly eclipsed by the positive psychosocial benefits of weight loss for all participants.

Quality of Life and Psychosocial Functioning

The following section examines health-related quality of life as it relates to obesity and bariatric surgery patients. Additionally, behavioral outcomes of obesity treatment, health-related quality of life and psychosocial functioning following obesity treatment are reviewed.

Health-Related Quality of Life

Understanding quality of life outcomes in bariatric surgery patients involves first examining quality of life issues in obese individuals. In reviewing the literature on obesity and health-related quality of life (HRQL), Fontaine and Barofsky (2001) noted that researchers employ various conceptual frameworks in the study of quality of life depending upon their focus. Some researchers are more concerned with medical outcomes while others emphasize the importance that people attach to different aspects of quality of life. The available tools include generic measures of quality of life or alternately, instruments designed to address a particular health issue or population.

HRQL research with obese populations yields two consistent findings (Fontaine & Barofsky, 2001). Specifically, quality of life, particularly physical functioning, becomes more impaired as BMI escalates. Conversely, weight reduction produces dramatic improvements in quality of life. Of particular note, Fontaine and Barofsky state that, “among patients who undergo obesity surgery, improved HRQL is
consistently reported to be the most important benefit of the weight reduction” (p. 180). The implication is clear that a critical issue in obesity related HRQL is sustaining weight loss after intervention.

According to Kolotkin and Crosby (2002), with advances in the treatment of obesity, there is a demand for instruments that accurately assess HRQL in participants in clinical trials. Analogous to the greater sensitivity of measures designed to assess weight self-efficacy and locus of control; the authors advocate the use of disease-specific measures of quality of life. The impact of weight on quality of life (IWQOL) was the first instrument devised to evaluate quality of life in the context of obesity. The original instrument is composed of 74 items addressing eight life domains: health, social/interpersonal, work, mobility, self-esteem, sexuality, activities of daily living, and comfort with food.

The IWQOL-Lite, a short-form of the IWQOL, consisting of 31 items was shown to have strong psychometric properties. The instrument has five subscales assessing physical function, self-esteem, sexual life, public distress, and work. Noting that research with the IWQOL-Lite was limited primarily to treatment samples, Kolotkin and Crosby (2002) applied the IWQOL-Lite to a demographically diverse community sample. Only respondents who had normal or high BMI and who were not involved in a weight loss program were included in the data analysis.

The IWQOL-Lite demonstrated superior internal consistency reliability and test-retest reliability for both the total sample and for analysis involving only overweight or obese respondents (Kolotkin & Crosby, 2002). As in a previous study conducted by Kolotkin and colleagues, the researchers observed high to moderate
correlations between BMI and scores on the IWQOL-Lite. In general, higher BMI was linked with greater impairment and lower quality of life. Obese women reported lower quality of life than obese men. Kolotkin and Crosby noted that in both studies, the overall differences between overweight and obese individuals did not reach statistical significance. At the same time, there was a drastic decline in quality of life for the most obese respondents, notably in physical functioning. Based on their results, Kolotkin and Crosby recommend the IWQOL-Lite as a valid tool for research with nonclinical samples, and particularly valuable for assessing quality of life in individuals in the upper ranges of BMI.

In their test of the IWQOL-Lite, Kolotkin and Crosby (2002) stressed the need for obesity research with community samples as well as treatment participants. In a detailed exploration of quality of life, Kolotkin, Crosby, and Williams (2002) included data from a range of obese adults from those not in treatment to gastric bypass patients. The demographically diverse sample of 3,353 adults included non-treatment community volunteers, clinical trial participants, participants in outpatient treatment programs, day treatment participants, and individuals seeking gastric bypass surgery. The instrument used was the IWQOL-Lite.

The findings disclosed that health related quality of life in obese adults differs across treatment or non-treatment status, choice of treatment, gender, race, and BMI (Kolotkin et al., 2002). The participants were selected to represent a continuum of treatment options ranging in intensity (in ascending order, non-treatment volunteers, clinical trial participants, outpatient program participants, day treatment participants, and gastric bypass patients). With each increase in treatment intensity, scores on all
five scales and total scores on the IWQOL-Lite displayed significantly greater impairment. Regardless of choice of treatment, treatment-seekers generally reported lower quality of life than the community volunteers. The composite profile revealed that treatment-seekers tended to be older, white, female, and heavier.

Kolotkin et al. (2002) found that while women in the community and clinical trials groups (those with the lowest mean BMI) reported lower quality of life than men in those groups, the reverse was true for the gastric bypass patients, where men had the highest levels of distress. Kolotkin et al. suggest that the high levels of distress reported by men in the gastric surgery group may imply that men opt for extreme methods of weight loss only when their quality of life has severely deteriorated, compared with women. In research involving a fairly high proportion of men, Swedish researchers found higher levels of distress among women choosing surgical weight loss (Karlsson et al., 1998). At the same time, a general population study of Swedish adults disclosed that among adults aged 35 to 64 years, obese women experienced impairments in all eight HRQL domains whereas obese men reported impairments only on physical functioning and general health perceptions (Larsson, Karlsson, & Sullivan, 2002).

Karlsson et al. (1998) employed data from the SOS to examine HRQL and eating behavior in the first 487 trial participants to undergo gastric surgery over the course of two years. Compared to the matched control group who received conventional weight loss treatment, the gastric surgery patients experienced dramatic improvements in HRQL. These findings conform to the general impact of obesity and weight loss on HRQL (Kolotkin et al., 2002). A strongpoint of the SOS is the attention
given to individual differences within each weight loss intervention category. Not all surgical patients lost substantial amounts of weight (Karlsson et al., 1998). Approximately 8% of the surgical patients lost less than 10 kg, while 24% experienced moderate weight loss (10-20 kg). The improvements were most pronounced in participants whose weight loss was at least 20 kg, whereas the HRQL of those with limited weight loss tended to revert to baseline levels.

Karlsson et al. (1998) observed a pattern in the improvements experienced by the surgical patients. Short-term improvements were striking yet they were followed by a slight to moderate long-term decline, particularly in the area of emotional well-being. Depressive symptoms prior to treatment improved radically after surgery, particularly in women. By 2 years, however, the positive impact attenuated significantly. It is important to note that upon entry into the study, women in both treatment conditions reported greater psychological distress than men. Although the dramatic improvements women experienced immediately after surgery were not enduring, at 2 years, male and female surgical patients had similar HRQL scores.

The surgical patients also experienced significant, enduring improvements in eating behavior (Karlsson et al., 1998). At the onset of the study, the surgical patients reported far more problems in controlling eating behavior than those who chose more conventional modes of weight loss. The overall pattern indicates that the surgical patients were motivated by a plethora of physical and psychosocial problems that were alleviated by substantial weight loss.

The Obesity-related Problems scale (OP) was devised for the purpose of evaluating the impact of obesity on psychosocial functioning (Karlsson et al., 2003).
The OP consists of eight items covering a range of social activities including attending private gatherings at home or at the homes of friends or relatives, going to restaurants, engaging in community activities, vacationing, bathing in public places, and sexual relations. Participants are asked the extent their obesity bothers them in each situation. The instrument can also be used with non-obese populations. Karlsson et al. tested the psychometric properties of the OP on four adult samples, three from the SOS: 6,863 subjects from the SOS cross-sectional study, 2,128 from the SOS intervention study, 1,017 non-obese subjects from the SOS reference study, and 3,305 obese subjects from the XENDOS study, a randomized clinical trial to determine whether diabetes in obese adults can be prevented through medication, diet, and exercise.

The analyses determined that the OP is both valid and reliable, a finding enhanced by the large sample size (Karlsson et al., 2003). The results showed that obese women experienced more distress than obese men, primarily at the lower end of the obesity range. As BMI increased, gender differences diminished and both men and women experienced high levels of impairment. Depression and anxiety symptoms paralleled the degree of problems assessed by the OP. Significant weight loss, whether by surgical or conventional means, resulted in marked improvements in psychosocial status. Participants who had undergone bariatric surgery and whose BMI fell below 30 at the 4-year follow-up exhibited mean OP scores equivalent to the level of the non-obese reference group. The results showed the same pattern as the earlier SOS study (Karlsson et al., 1998), namely that higher weight loss translated into higher quality of life (Karlsson et al., 2003).
Bond et al. (2006) explored HRQL, physical activity, and readiness for physical activity in a group of women and men preparing for gastric bypass surgery. The rationale for the study was that knowledge of physical and psychological functioning immediately prior to surgery can be used to promote long-term positive behavior changes. Two assessments took place, at the first consultation, and at history and physical examination one to two weeks before surgery. The typical surgery candidate was a middle-aged white woman with a BMI over 40.

Positive changes took place in the interim between the initial consultation and the pre-surgery examination (Bond et al., 2006). The difference in mental well-being was substantial; at the second assessment, the mean scores on mental health were nearly equivalent to U.S. general population norms. The participants anticipated a myriad of positive changes following surgery including enhanced self-esteem, body image, and social interactions, in conjunction with decreases in stigmatization, discrimination, physical constraints, and debilitating pain. Bond et al. attribute much of the positive change to these anticipated results. The fact that these changes took place even before weight reduction supports the assumption of Karlsson et al. (1998) that positive expectations play a key role in the immediate rise in HRQL after surgery regardless of the amount of weight loss.

The surgery candidates reported marked increases in physical activity of various intensities as well as the overall amount of physical activity as they neared the day of surgery (Bond et al., 2006). Parallel increases occurred in readiness for exercise. Using the Transtheoretical Model of Behavior Change, 19% of participants were in the preparation stage, 16% had begun exercise (the action stage), 10% reported
remaining active, and 9% were in the maintenance stage. On the other hand, some participants had suspended regular exercise between visits, while expressing strong intentions to resume after surgery. The study did not examine their reasons. Bond et al. emphasized that the overall pattern was in favor of increased activity prior to surgery, adding that physical activity might speed recovery from surgery as well as stimulate increased weight loss and lead to higher levels of activity after surgery.

Not unexpectedly, there was a strong relationship between quality of life and physical exercise, a consistent finding in general population studies (Bond et al., 2006). Participants who reported being physically active at both visits had the highest levels of physical functioning and vitality. Significant differences in HRQL between more active and more sedentary participants were especially prominent at the second visit. Based on their findings, Bond et al. propose that the period prior to bariatric surgery is an excellent time to target strategies for promoting the adoption and maintenance of regular physical exercise.

Dymek et al. (2002) utilized the IWQOL-Lite to investigate HRQL in severely obese patients at different stages of the surgical process. The study involved a control group of patients awaiting gastric bypass surgery, and three different patient groups at 2 to 4 weeks, 6 months, and 1 year post-surgery.

Significant differences in BMI, depression, self-esteem, and an array of HRQL factors appeared for participants at different points in the surgical process (Dymek et al., 2002). Dymek et al. (2002) were surprised to see powerful differences in health perceptions, depression, and self-esteem between patients who had just undergone surgery compared to the pre-surgery control group. However, longitudinal data
indicates that an immediate rise in physical and psychosocial well-being is a common phenomenon (Karlsson et al., 1998). The most striking differences between the surgery patients and the control group were observed 6 months after surgery. The steep positive impact seemed to taper off after 6 months although the IWQOL-LITE captured significant differences between groups on physical functioning, self-esteem, sexual life, and public distress one year after surgery (Dymek et al., 2002). Reflecting the views of Kolotkin and Crosby (2002), Dymek et al. (2002) argue that a specific instrument such as the IWQOL-Lite is more sensitive to changes in the target population than a more generic measure.

Dymek et al. (2002) noted that improvements in BMI, depression, self-esteem, and HRQL did not exhibit the same pattern over time, implying that positive perceptions were not directly related to the amount of weight lost. Although Karlsson et al. (1998) found a definite correlation between weight loss and HRQL among subgroups of patients who lost differing amounts of weight, they attribute the trajectory of improvements to positive expectations, which could play a role in the temporal pattern observed by Dymek et al. (2002).

Sabbioni et al. (2002) explored HRQL in a follow-up study of 82 patients who had undergone vertical banded gastroplasty. Prior to surgery, the participants were severely obese, with a mean BMI of 46.29. The mean duration post-surgery was 21.55 months; for 85% of the participants, 2 years had lapsed since surgery.

The results demonstrated that positive improvements in HRQL persisted two years after surgery (Sabbioni et al., 2002). As in the study of Dymek et al. (2002), HRQL was not related to the amount of weight lost (Sabbioni et al., 2002). In fact,
neither sociodemographic factors nor preoperative HRQL were related to weight loss. Sabbioni et al. concluded that weight loss alone is insufficient for predicting HRQL after bariatric surgery, thus highlighting the need for greater attention to psychosocial factors.

A seemingly paradoxical finding was that patients who were better at coping and adjusting to obesity and treatment prior to surgery experienced more psychological distress the second year (Sabbioni et al., 2002). Sabbioni et al.(2002) attributed this to the withdrawal of social support that occurs after 1 year. Social support in the preoperative period is linked with higher HRQL. Bedine (2003) states that a social support network comprised of family and friends are essential during the postoperative period when the recovering patient must cope with drastic changes in eating habits.

There is powerful evidence in favor of social support as an essential component of lifestyle interventions for weight management (Verheijden et al., 2005). Social support can be divided into structural and functional support. Structural support denotes the availability of important others within one’s social network. Functional support refers to the subjective perception that others will be available when needed, and varies according to individual characteristics and expectations. Verheijden et al. argue that pragmatically, it is simpler to provide people with structural support in the form of health professionals or peers than attempt to change their perceptions. The findings of Sabbioni et al. (2002) suggest that many bariatric surgery patients would benefit from structural support extended beyond the 1-year milestone. The degree of support preferred might vary according to control orientation (Lefcort, 1984; Nir & Neumann, 1995; Wallston et al., 1976).
The focus of Porter and Wampler (2000) was the quality of marital relationships for women and men who had undergone gastric bypass surgery within the past year. As in the study of Dymek et al. (2002), remarkable changes in self-esteem and depression (which typically show an inverse relationship) took place within the first 6 months (Porter & Wampler, 2000). At the same time, the positive physical and psychological had inconsistent effects on the quality of the relationship. The overall finding in research is that bariatric surgery has a favorable impact on personal relationships (Herpertz et al., 2003). Porter and Wampler, (2000) noted that the desire to improve their relationship is commonly cited as a key reason for opting for bariatric surgery. However, some obese men and women may see surgery as a panacea for relationship problems and hence have unrealistic expectations. Additionally, they stressed that couples typically have to *renegotiate* the terms of the relationship. Changes in self-concepts may result in changes to the relationship not always favorable to the spouse. There are also marriages that are held together by a partner’s severe obesity.

Porter and Wampler (2000) advocated involving spouses in the weight loss process of bariatric surgery patients. Albeit from a different perspective, spouses or partners are excellent sources of social support for long-term weight management (Verheijden, 2005).

Adami et al. (2005) used the original IWQOL to assess HRQL in a longitudinal study of adults who had undergone biliopancreatic diversion. Before surgery, the severely obese participants had significantly lower HRQL than a non-obese control group. One year after surgery, the surgery patients reported marked improvement on
all IWQOL subscales, roughly approximating the levels of the control group. The most notable finding was the apparent comfort with food. The participants were able to enjoy food and eat a regular diet while maintaining control over their weight. While acknowledging that improvements in HRQL are typically reported after bariatric surgery irrespective of the type of procedure, Adami et al. argue that biliopancreatic diversion has advantages because it does not place physical restrictions on food intake. Nausea and vomiting are common among individuals who undergo vertical banded gastroplasty (Sabbioni et al., 2002). The participants surveyed by Adami et al. (2005) experienced powerful and sustained improvements in both physical and psychosocial functioning after surgery.

Using a cross-sectional research design, van Gemert et al. (1998) examined psychosocial functioning in 62 previously morbidly obese adults who had undergone gastric bypass or vertical banded gastroplasty surgery between 1982 and 1993. The preoperative psychological status of the participants was typical of bariatric surgery candidates, reflecting a constellation of problems. They reported feelings of depression, insecurity and despair, somatization, denial of emotional stress, interpersonal difficulties, poor social adjustment, and diminished self-esteem.

The method of surgery had no impact on the psychological outcome and any physical complications did not undermine the positive benefits of the radical weight loss (van Gemert et al., 1998). The predominant benefits were enhanced self-esteem, self-confidence, and assertion, improvement in social activity and interpersonal relationships, and the alleviation of depression and anxiety. Self-esteem, which sharply increased after surgical weight loss, proved to be the most powerful predictor
of long-term weight management. Van Gemert et al. (1998) proposed that, “Morbidly obese patients with a low self-esteem are possibly the patients with the greatest psychological suffering and therefore the best motivated patients to comply with postoperative dietary and medical instructions” (p. 397). An advantage to this study is that the researchers focused on individuals many years after obesity surgery as opposed to the typical focus on short-term effects (2 years or less). Although the sample was small, the results are analogous to those of the large, multi-center SOS (Karlsson et al., 1998, 2003).

Bocchieri et al. (2002) conducted one of the few qualitative explorations of psychosocial outcomes of bariatric surgery. The participants were 31 individuals who gastric bypass surgery from 6 months to 11 years earlier. The participants were interviewed either individually or in focus groups.

The overwhelming experience was a sense of transformation or rebirth (Bocchieri et al., 2002). The participants interpreted their feelings in several ways such as “getting a second chance at life, suddenly becoming visible to a world in which they once felt insignificant, and developing a newfound sense of freedom from preoperative entrapment in their own bodies” (pp. 783-784). Those who experienced the greatest distress and despair prior to surgery reported the most profound metamorphosis. Albeit less eloquently, this effect of surgery routinely appears in quantitative research (Herpertz et al., 2003, 2004). The dramatic increase in self-esteem that predicted successful outcomes in the study of van Gemert et al. (1998) is implicit in the transformation theme (Bocchieri et al., 2002).
The predominant benefit after surgery was the ability to be physically active free of the constraints imposed by morbid obesity (Bocchieri et al., 2002). Whether or not they began exercise before surgery, the prospective surgery patients surveyed by Bond et al. (2006) had strong expectations for heightened physical energy and activity. Having already experienced surgery and enjoyed the positive effects on physical health and activity, the interviewees envisioned enjoying a longer, healthier, more rewarding life (Bocchieri et al., 2002). With increases in energy, activity, and confidence, they saw positive changes in their personal and professional lives. They became more confident parents and acted as role models for healthy eating and activity. Some participants returned to school while others changed jobs or gained some promotions, or even returned to work after long-term disability due to obesity-related conditions. Improved educational and occupational statuses are empirically documented positive benefits of bariatric surgery (Herpertz et al., 2003).

An advantage of qualitative research is that it has the power to reveal insights that are absent from quantitative reports. In addition to the undeniable benefits of surgery, the interviewees experienced some changes as more equivocal (Bocchieri et al., 2002). Porter and Wampler (2000) proposed that the limited impact of bariatric surgery on relationships they observed might be due to the unrealistic expectations of individuals who view surgical weight loss as a panacea for relationship problems. The narratives indicated that some surgery patients hold weight loss as a panacea for other problems or dissatisfaction they experienced when obese (Bocchieri et al., 2002). After shedding excess weight, they became aware that some of their problems persisted and they were forced to acknowledge that their weight had been an excuse for not
pursuing personal goals or acted as a shield against rejection. Invoking the concept of locus of control, “Patients were forced to consider internal rather than external factors contributing to their limitations” (p. 784). Some individuals had been so immersed in their weight that they lost a sense of who they were. Although the process was challenging, they emerged with a strong sense of self.

Along with changes in self-concepts, the participants realized that they were no longer willing to make compromises or put up with conditions as they had when they were obese (Bocchieri et al., 2002). They set higher standards for themselves and many became more assertive. Such changes underlie the need to renegotiate relationships after bariatric surgery (Porter & Wampler, 2000). This was apparent in many narratives where the person had previously been dependent or afraid of being abandoned and now felt self-confident and attractive (Bocchieri et al., 2002). For most participants, surgery had a strong positive impact on sexual desire and energy although some expressed self-consciousness over excess skin, which undermined body image.

An intriguing finding was that some individuals construed having surgery as a sign of failure (Bocchieri et al., 2002). They feared that others would see them as “weak-willed” because they had not been able to lose weight successfully “on their own” (p. 785). This concern reflects the internalization of social stigma related to obesity (Wang et al., 2004). This issue was especially common among participants who had been successful in other areas of their lives and held weight loss to be “their one major achievement failure” (p. 785). Some gradually came to accept their decision for surgery while, “For others, these feelings persisted even after the realization that gastric bypass still demanded Herculean effort and willpower to maintain weight loss.”
There is no indication that their feelings actually impeded the ability to maintain a desirable weight.

On the other hand, individuals who viewed themselves as “emotional eaters” usually had the most difficult time adopting new patterns of eating (Bocchieri et al., 2002). Since they had relied on eating as a mechanism for coping with negative emotions they confronted with the challenge of learning new coping strategies. These individuals would probably benefit from cognitive behavior strategies (Bandura, 1986, 1997; Kitsantas, 2000) and social support (Nir & Neumann, 1991, 1995; Reicks et al., 2000; Verheijden et al., 2005).

The narrative study revealed a complex picture of life after bariatric surgery. Although it appears that the advantages of surgical weight loss far surpass the physical limitations and psychosocial distress endemic in morbid obesity, post-surgical patients are confronted with new challenges. Bocchieri et al. (2002) emphasize that this aspect of bariatric surgery is typically neglected in research.

**Behavioral Interventions and Individual Differences in Outcome**

The experiences described by Bocchieri et al. (2002) suggest that many bariatric surgery patients would gain from interventions to promote adaptation and behavioral change after surgery. However, they also imply that there may be individual differences in who benefits the most and in divergent areas of quality of life and psychosocial functioning. Tucker et al. (1991) investigated the short-term and long-term effects of a structured behavioral intervention on weight loss and psychosocial functioning. Seventeen patients participated in a cognitive behavioral intervention in which they were given weight management materials biweekly for six
months in conjunction with monthly behavioral consultations. Fifteen patients served as a minimal intervention control group. The histories of the patients revealed a myriad of strategies to lose weight including diet pills, Weight Watchers, supervised or unsupervised diets, starvation, human chorionic gonadotropin injections, behavior modification, and hypnosis. On average, the patients had tried at least four different strategies before seeking surgery.

As is routinely reported, the patients in both groups lost substantial amounts of weight in the first year after surgery. The average weight loss was slightly less than two pounds per week, stabilizing during the second year (Tucker et al., 1991). Counter to expectations, the behavioral intervention did not increase the amount of weight lost. One possible explanation offered by Tucker et al. is that the intervention was based on programs designed for moderately overweight individuals and might not have been intensive enough or of sufficient duration for individuals who had been morbidly obese and had histories of repeated failed weight loss attempts. Several authors maintain that if obesity is framed as a chronic disease, short-term interventions are inadequate for producing enduring change (Nir & Neumann, 1991, 1995; Verheijden et al., 2005).

An alternative explanation is that there were sizable individual differences in weight loss, which might have obscured increments in weight loss among the intervention participants (Tucker et al., 1991). Inadvertently, this finding underscores the importance of paying attention to individual differences. Some patients might have derived more benefits from the intervention than others. Other research supports the idea that a flexible approach is the best way to help individuals with preferences for different degrees of support (Nir & Neumann, 1995 Richman et al., 2001). Qualitative
accounts strongly suggest that bariatric surgery patients have different needs for strategies to help them adjust their eating behavior (Bocchieri et al., 2002). Emotional eaters, in particular, require assistance.

Although the intervention did not seem to affect weight loss, the participants engaged in physical exercise more regularly and reported higher quality marital and family relationships than the control group (Tucker et al., 1991). Given the importance of these aspects of psychosocial functioning on quality of life, the findings should not be dismissed. Ironically, the intervention was least successful in the target area. Despite the focus of the materials, Tucker et al. found the typical diet to be nutritionally unsound, consisting of high fat intake and low levels of protein and carbohydrates. To some extent, this may reflect physiological and metabolic changes resulting from surgery (Klem et al., 2000). Tucker et al. (1991) recommend more intensive intervention targeted to the specific needs of obesity surgery patients rather than adapted from conventional weight management programs.

Summary

Psychosocial predictors of successful outcomes in bariatric surgery patients show an ironic pattern compared to participants in conventional weight loss programs. Whereas depression, anxiety, and low self-esteem undermine successful weight control in the general population, these same characteristics predict successful outcomes after obesity surgery. This phenomenon reflects the assumption that extreme distress related to severe obesity motivates the decision to have surgery and to maintain a good weight. It also implies that for most individuals, psychosocial distress is the result rather than the cause of obesity.
Several studies discerned different subgroups of post-surgery patients, including some who have difficulties adjusting to new eating behaviors, coping with changing intrapersonal or interpersonal dynamics, or who have residual eating disturbances. Although dramatic increases in self-esteem and self-confidence are virtually universal, there is less support for the assumption that surgery increases confidence in the ability to control eating behaviors. Restrictions on eating imposed by surgical procedures present new challenges. Many individuals would clearly benefit from self-regulation strategies and formal or informal social support. Clearly there are differences in subgroups of the bariatric surgery patient population, but the specific role of self-efficacy, locus of control and aspects of quality of life have not been addressed in research to date.

Research on locus of control in bariatric surgery patients is negligible. Some accounts indicate that obese individuals attribute problems in various aspects of life to their excess weight. After rapid, dramatic weight loss, they are confronted with the reality of taking responsibility for their lives. There is evidence from weight management research that structuring the degree of support to different control orientations produces more favorable results.

The overarching finding is that bariatric surgery has a powerful and enduring impact on all quality of life dimensions. Nevertheless, a deeper understanding of psychosocial factors has the potential to enhance the benefits of surgery, particularly for those who have difficulty adapting to changing demands for eating and social behavior.
The purpose of this study is to investigate the role of the social cognitive (psychosocial) variables of self-efficacy and locus of control in predicting weight loss and quality of life in post bariatric surgery patients. The study will focus on the mediating effects of weight loss on the relationship between self-efficacy and locus of control on aspects of quality of life. Another goal will be to compare two subgroups: (a) those that are successful in maintaining 50% EWL goal and (b) those that lose less than 50% EWL goal in terms of self-efficacy, locus of control, and quality of life. It is hoped that the findings from this study will ultimately lead to improved treatment interventions and outcomes tailored to the needs of different subgroups of bariatric surgery patients.
CHAPTER III

METHOD

Introduction

Chapter III presents a description of the research design and statistical analyses employed, sampling strategies and data collection procedures. Additionally a review and explanation of the instruments, the research hypotheses and their derivation and a list of variables were presented.

Research Design

This investigation utilized an ex post facto research design with hypotheses and tests of alternative hypotheses (Newman, Newman, Brown, & McNeely, 2006; Pedhazur & Schmelkin, 1991). The validity of this design was increased by stating relevant hypothetical research hypotheses. According to Newman and Newman (1994),

ex post facto research with hypotheses and tests for alternative hypotheses is considerably more powerful in terms of internal validity than pre experimental, ex post facto designs with no hypotheses, and ex post facto designs with hypotheses. (p. 112)

In addition, Newman and Newman stated that this type of research design has a potential of higher external validity when compared to quasi and true experimental design.
Kerlinger and Blee (2000) identified three weaknesses of ex post facto design. These weaknesses included the inability to manipulate the independent variable, the lack of power to randomize, and the risk of improper interpretation. In this study, the lack of ability to control the independent variables due to ethical or convenience reasons only allowed the researcher to demonstrate relationships and infer causation (Kazdin, 1992).

Data Collection Procedures

A general hospital information flyer was sent to all post-surgery patients in December. Included in this flyer was a general interest mailer that included a call for research participants. Hospital staff members compiled a list of potential study participants. The researcher contacted each interested individual and explained the nature of the research. Packets including a cover letter, the demographic questionnaire, the Weight Self-Efficacy Lifestyle Questionnaire (WEL), the Dieting Beliefs Scale (DBS), the Impact of Weight on Quality of Life Lite Questionnaire (IWQOL-Lite), and a return addressed stamped envelope were sent to all who were interested. The cover letter explained the purpose of the study and the rights of participants, provided contact numbers, and requested that all data be returned to the researcher within two weeks. After a 3-week interval, participants who have not returned their completed surveys received a follow-up call requesting that they complete and return the packets as soon as possible. Packets were also distributed at one monthly post-surgery support group meeting. All packets and measures were coded to assure confidentiality. Data collection occurred between March 2007 and June, 2007. In total 210 post-bariatric surgery patients were initially contacted. Of the 210 contacted, 196 agreed to
participate in the study and were mailed research packets. Three weeks following the initial mailing participants were contacted by the researcher a second time if packets were not returned in the specified time period. A second packet was mailed on request at the time of the second contact. A total of 26 second packets were mailed on request. A total of 92 packets were returned, a 47% response rate.

Sampling Procedures/Strategies

Participants were recruited at a community teaching hospital in Cleveland, Ohio. A general hospital information flyer was mailed to all post-surgery patients in December (2006). Included in this informational flyer was a general interest mailer that included a call for research participants. A hospital staff member compiled a list of all patients that contact the hospital and express an interest in participating in research. Beginning in March 2007, the researcher contacted all interested participants by phone, email or letter depending on their requested method of contact to explain the nature of the research. Following the researcher’s initial contact, a packet including: an introductory letter with explanation of the study, an informed consent form, the Demographic Questionnaire, The Weight Self-Efficacy Questionnaire, and The DiETING Beliefs Scale and the Impact of Weight on Quality of Life-Lite Questionnaire with a return addressed stamped envelope was mailed to each participant. The participants were requested to return the information in the stamped addressed envelope within 2 weeks. Measures were placed in random order in the envelopes to control for response set bias. If information was not returned as requested, participants received a follow-up call, email or letter based on their requested method of contact from the researcher.
requesting they complete and return the packets. Packets were distributed at one
monthly post-surgery support group meeting.

Participants

Participants were post-bariatric surgery patients recruited from community
teaching hospital in Cleveland, Ohio. Participants volunteered to participate in the
study.

There were 92 post-bariatric surgery patients that participated in this research.
Of these patients 79 (85.87%) were female and 13 (14.13%) were male. The majority
of the patients (91.5%) were Caucasian with only 8.5% African American. No other
ethnicities participated in this study. Educational level ranged widely with the largest
portion of the participants 44.6% attending some college, 21.7% completed college,
21.7% completed graduate school, 3.3% had only some high school, and 13%
completed high school. The majority of these participants 56 (60.9%) were married,
19 (20.7%) never married, 12 (13%) were divorced, 4 (4.4%) were widowed and 1
(1.1%) reported other (See Table 1).

Power Analysis

Newman and Benz (1983) proposed that power analysis can be used to “accept”
the null hypotheses within specified confidence intervals. In this study, a power
analysis was calculated to determine the probability of detecting a significant
difference when one exists (McNeil, Newman & Kelly, 1996). It was determined that
for an alpha level of .05 and power of 80, an N of approximately 75 was needed to
detect a medium effect size ($f^2 = .15$) according to Cohen (1977) and McNeil,
Table 1

Frequencies

<table>
<thead>
<tr>
<th>Variables</th>
<th>Numbers</th>
<th>Valid Percents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>79</td>
<td>85.87%</td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
<td>14.13%</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>85</td>
<td>91.5%</td>
</tr>
<tr>
<td>African American</td>
<td>7</td>
<td>8.5%</td>
</tr>
<tr>
<td>Education Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some High School</td>
<td>3</td>
<td>3.3%</td>
</tr>
<tr>
<td>High School/ GED</td>
<td>12</td>
<td>13.0%</td>
</tr>
<tr>
<td>Some College</td>
<td>41</td>
<td>44.6%</td>
</tr>
<tr>
<td>Completed College</td>
<td>20</td>
<td>21.7%</td>
</tr>
<tr>
<td>Graduate School</td>
<td>16</td>
<td>17.4%</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td>19</td>
<td>20.7%</td>
</tr>
<tr>
<td>Married</td>
<td>56</td>
<td>60.9%</td>
</tr>
<tr>
<td>Divorced</td>
<td>12</td>
<td>13.0%</td>
</tr>
<tr>
<td>Widowed</td>
<td>4</td>
<td>4.4%</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Instruments

The instruments chosen for this study included The Weight Self-efficacy Life-Style Questionnaire (WEL) (Clark Abrams, Niaura, Eaton, & Rossi, 1991), The Dieting Beliefs Scale (DBS) (Stotland & Zuroff, 1990), and the Impact of Weight on Quality of Life-Lite Questionnaire (IWQOL-Lite) (Kolotkin, Crosby, & Kosloski 2001; Kolotkin & Crosby, 2002). All subscales were used from the WEL, DBS, and IWQOL-Lite. In addition, a demographic questionnaire was included to gather
pertinent participant information including age, gender, pre-surgery and post-surgery
weight, height, and current weight (see Appendix C). The following presents a
description of the WEL, the DBS, and the IWQOL-Lite (see Appendices D, E, and F,
respectively).

*Weight-Efficacy Life-Style Questionnaire (WEL)*

The Weight Efficacy Life-Style Questionnaire (WEL) developed by Clark,
Abrams, Niaura, Eaton, and Rossi (1991) is a 20-item measure designed to assess
eating patterns and attitudes and has been used in research with overweight or obese
participants (Richman et al., 2001). Factor analysis revealed the presence of five
factors that were divided into five subscales with four items per subscale. The five
subscales included situational dimensions encompassing (a) Negative Emotions, (b)
Availability, (c) Social Pressure, (d) Physical Discomfort, and (e) Positive Activities.
Participants are given 20 situations and asked to rate their confidence in resisting the
desire to eat in each one. The participant’s answers are rated on a 10-point Likert scale
with ratings ranging from 0 (not confident) to 9 (very confident). Each of the subscales
has a range from 0 to 36, with a total score range of 0-180. The WEL can be used as
both a general screening tool when scored as a single general scale producing a global
self-efficacy score. When scored as five separate scales, the WEL can be used as a
guide in the assessment of strengths and weaknesses of cognitive behavioral
mechanisms related to control over eating (Clark, Abrams, Niaura, Eaton, & Rossi,
1991). The global self-efficacy score was used in this study. A higher total score
indicated greater ability to resist eating.
A typical item on the Negative Emotions subscale (Clark et al., 1991) is, “I can resist eating when I am depressed (or down).” A typical item on the Availability subscale is, “I can control my eating when there are many different kinds of food available.” A typical item on the Social Pressure subscale is, “I can resist eating even when I think others will be upset if I don’t eat.” A typical item on the Physical Discomfort subscale is, “I can resist eating when I am in pain.” A typical item on the Positive Activities subscale is, “I can resist eating when I am watching TV.” In all cases, a higher score indicates greater ability to resist eating.

Internal consistency reliability estimates of the WEL ranged from .70 to .90 with a median of .84 in two studies (Clark et al., 1991). Subscale intercorrelations ranged from .37 to .65, with a median of .51, indicating that the subscales measured related variables organized around a central construct of the eating self-efficacy. External validity was assessed in two independent clinical samples, one of a weight management program for obese diabetic patients, and the other of a program for obese patients that combined behavioral therapy and a very low calorie diet. In both cases, the WEL indicated significant increases in eating self-efficacy, indicating that the scale was sensitive to change.

_Dieting Beliefs Scale (DBS)_

The Dieting Beliefs Scale (DBS) developed by Stotland and Zuroff (1990) is a 16-item inventory designed to measure weight locus of control. The DBS was devised to assess the extent to which one believes that weight is controllable (Paxton & Sculthorpe, 1999). The DBS was originally validated on 100 female university students. Principal components analysis of the scale yielded three factors. The three
factors were: (a) Internal Control Over Weight; (b) Chance, Genetics, and Weight; and (c) Environment and Weight. Internal Control Over Weight assessed internal weight locus of control, and the other two factors, Chance, Genetics and Weight, and Environment and Weight assessed external locus of control. Participants respond to statements reflecting self-beliefs statements on a 6-point Likert-type scale ranging from 1 (not at all descriptive of my beliefs) to 6 (very descriptive of my beliefs). Total scale scores range from 16 to 96. A typical item reflecting internal control over weight Stotland and Zuroff (1990) is, “Each of us is directly responsible for our weight.” An item reflecting belief in chance factors is, “Most people are at their present weight because that is the weight level that is natural for them.” An item reflecting belief in environmental factors is, “Most people can only diet successfully when other people push them to do it.” Although the factor analysis indicated three separate factors, the DBS is scored as a single factor scale with higher scores indicating internal locus of control. It was tested for internal consistency reliability using coefficient alpha. The alpha was .68, which is considered adequate. Test-retest reliability was assessed on 43 available members of the original sample after a 6-week interval; the correlation between pretest and posttest was .81, considered quite high. The DBS was scored as a single factor total score in this study. A higher score indicated an internal locus of control.

Criterion validity was assessed by correlating DBS scores with the Weight Locus of Control (WLOC) developed by Salter (1982); the correlation was .62, indicating that they measured similar constructs. Scores on the DBS were also correlated with Rosenberg’s Self-Esteem Scale (Rosenberg, 1965), the Binge Scale
(Hawkins & Clement, 1980), and the Crowne-Marlowe Social Desirability Scale (Crowne & Marlowe, 1960). In addition, for the purpose of validation scores were correlated with several weight related and psychological variables.

The DBS correlated significantly with self-perception of weight problem \((r = .29, \ p < .01)\), eating restraint \((r = .22, \ p < .05)\), body mass index (BMI) \((r = .27, \ p < .01)\), whether they were currently dieting \((r = .29, \ p < .01)\), whether they had ever dieted \((r = .44, \ p < .01)\), and dieting success \((r = .25, \ p < .05)\). It did not correlate significantly with self-esteem, binge eating, or social desirability. The pattern of correlations suggested good convergent validity. It correlated strongly with the WLOC, but did not correlate significantly with social desirability, as did the WLOC. It was expected that persons with higher levels of dietary locus of control would evidence greater concern over their weight, elevated levels of the eating restraint, more attempts at dieting, and greater success at dieting. Although the authors suggested that the positive relationship between the BMI and the DBS was a consequence of dissatisfaction with one's weight, it raised questions about the validity of the indicator because intuitively, one would expect that higher scores on the DBS would be related to lower scores on the BMI.

**IWQOL-Lite**

One population specific quality of life measure used in research with obese individuals is the Impact of Weight on Quality of Life Questionnaire-Lite Version (IWQOL-Lite). This is a self-report measure of obesity-specific quality of life.

The IWQOL-Lite is a 31-item obesity specific instrument designed specifically to assess the effects of obesity on quality of life (Kolotkin & Crosby, 2002; Kolotkin,
The IWQOL-Lite is comprised of five scales: Physical Function (11 items), Self-Esteem (7 items), Sexual Life (4 items), Public Distress (5 items), and Work (4 items). All scales have a range from 1 to 5. Raw scores for each scale are computed by adding item scores. A global score is calculated by adding all subscale scores. Transformed scores range from 0 to 100. Lower scores indicate a poorer quality of life and higher scores indicate a better quality of life with little interference of weight with life activities.

The Physical Function Scale assesses the effects of obesity on daily life activities, such as bending over, tying one's shoes, and experiencing shortness of breath. Typical items include, “Because of my weight I have trouble with mobility,” and “I am worried about my health.”

The Self-Esteem Scale focuses on self-consciousness, self-assurance, fear of rejection, and so forth. The Self-esteem subscale assesses the impact of weight on an individual’s self-esteem (e.g., “Because of my weight I feel unsure of myself”; “Because of my weight I am embarrassed to be seen in public places”).

Sexual Life deals with deleterious effects of obesity on sexual relations. The Sexual Life subscale contains four items that assess the impact of weight on an individual’s sexual life (e.g., “Because of my weight I do not enjoy sexual activity”; “Because of my weight I avoid sexual encounters whenever possible”).

Public Distress focuses on problems fitting into chairs, walking down aisles, and social discrimination. The Public Distress subscale contains five items that assess the impact of weight on an individual’s public image (e.g., “Because of my weight I
experience ridicule, teasing, or unwanted attention”; “Because of my weight I experience discrimination by others”).

The Work Scale assesses the effects of obesity on job functioning, such as productivity, fear of interviews, and lack of recognition. The Work subscale contains four items (“Because of my weight I am less productive than I could be”; “Because of my weight I am afraid to go on job interviews”).

The IWQOL-Lite was validated on a sample of 1987 subjects, 615 of whom were male and 1372 who were female (Kolotkin et al., 2001). A control group of 223 non-obese persons were included in the sample; 1764 were obese. From an original pool of 74 items, factor analyses were performed, reducing the final pool to 31 items. Item to scale correlations were uniformly high and all subscale coefficient alpha statistics were above .90. Correlations among the scales ranged from .46 (Sexual Life and Public Distress) to .70 (Physical Function and Public Distress). These correlations suggested that the scales measure different aspects of a central construct, which is identified as quality in life. Correlations were neither so low (< .35) that they indicated independence nor so high (> .85) that they indicated that they were measuring virtually identical constructs (Pedhazur & Schmelkin, 1991).

Convergent validation was assessed by correlating IWQOL-Lite scores with Body Mass Index (BMI) over a period of 1 year (Kolotkin et al., 2001). The greater the loss of body mass, the higher the quality of life indicators. Effect sizes measured in standard deviation increments indicated that quality-of-life increased 0.46 of a standard deviation for those who lost less than 10% of the body mass. For those who lost between 10% and 20% of their body mass, quality-of-life indicators increased 0.65
standard deviations; for those losing 20% of their body mass or more, quality-of-life improvement measured 1.12 standard deviations. Physical functioning showed the greatest amount of change (ES = 0.81) and work changed the least (ES = 0.26).

In another test of convergent validity, Kolotkin and Crosby (2002) recruited a sample of 494 obese subjects with BMI scores greater than 18.5 and administered the IWQOL-LITE and the SF-36, a commonly used measure of health-related quality of life. Internal consistency reliability scores ranged from .82 (Work) to .94 (Self-Esteem) using coefficient alpha. Stability coefficients were computed that were essentially in the same range as the coefficient alphas. All correlations between the IWQOL-Lite and the SF-36 were in the expected directions, significant, and in the moderate range. Social acceptability was tested using the Crown Marlowe Scale. With the exception of self-esteem, correlations were below .20. Even though all but one was statistically significant, the proportion of variance accounted for by social acceptability was less than 5%. Self-esteem, however, correlated .29 with the Crown Marlowe Scale, indicating that over 8% of the variance in self-esteem could be attributed to social acceptable responses. The self-esteem indicator was the strongest of the five scales ($r = .57, p < .01$) correlated with the Rosenberg self-esteem scale.

On the basis of the above findings, the authors concluded that the IWQOL-Lite had convergent and discriminant validity. It discriminated between subsamples based on both body mass and weight loss. It also correlated well with alternative measures of similar constructs. With the exception of self-esteem, social acceptability was a minor factor. Because of its extensive validation, ease of administration and appropriateness
to the obese population, the IWQOL-Lite is a frequently used measure in current bariatric research.

While the psychometrics of the IWQOL-Lite appeared to be robust, the use of one instrument to measure quality of life, particularly when assessing individuals with eating disorders, may present an incomplete or inaccurate picture of an individual’s quality of life. For individuals with anorexia for example, a reported high rating on quality of life measures may be reflected when food restriction is at its highest and weight the lowest. This subjectively reported response would be in opposition to improved quality of life and in actuality reflect disease/pathology. This speaks to the importance of using appropriate measures for appropriate populations (Hayas, Quintana, Padierna, Bilboa, Munoz, & Madrazo, 2006). This bias did not appear to be associated with the IWQOL-Lite given the correlation between obesity and decreased physical functioning, self-esteem, sexual life, work functioning and increased public distress. In addition to the subscale scores reflecting the aforementioned domains, the IWQOL-Lite produces a global total score. The global quality of life scale was used in this study.

In conclusion, quality of life measures have grown significantly over the past 10 years. Given the properties of the IWQOL-Lite with supported validity, the appropriateness and acceptability of the measure with obese individuals, the demonstrated reliability and interpretability of the measure in clinical practice, there appears to be a utility for this measure both in research and practice.
General Research Hypotheses

*General Hypothesis 1.* The prediction of quality of life variables as measured by the IWQOL-Lite total score, by the social cognitive variables of global weight self-efficacy as measured by the WEL, and weight locus of control as measured by the total score of the DBS will be mediated by the amount of weight loss post-bariatric surgery. This hypothesis was tested using multiple regression procedures and the Baron and Kenny (1986) model for testing mediation as seen in Figure 1.

**Model---- (Baron and Kenny, 1986)**

![Stage 1 Regression Model](image1)

![Stage 2 Mediation Model](image2)

*Figure 1.* Modeling relations among locus of control, self-efficacy, weight loss, and quality of life in bariatric surgery patients

*General Hypothesis 2.* There will be significant differences in post-bariatric surgery patients between those who lose more than 50% of their excess weight loss
goal and those who lose less than 50% of their excess weight loss goal on weight self-efficacy (as measured by the WEL total score), weight locus of control (as measured by the DBS total score), and quality of life (as measured by the IWQOL-Lite total score). This hypothesis was tested using discriminant function analysis as represented in Figure 2.

![Figure 2. Relationship between successful and unsuccessful bariatric surgery groups and the discriminating variables](image)

Discriminant analysis is a multivariate technique utilized to study group differences (Betz, 1987). This technique provided a method for investigating the extent that multiple predictor variables related to a criterion variable. This was accomplished through determining the linear combination of variables that best discriminated between the two groups in this study classified as successful and unsuccessful post-bariatric surgery patient groups.
Derivation of General Research Hypotheses and Specific Research Hypotheses

In the general weight management literature, self-efficacy (Bandura, 1997; Berman, 2006; Kitsantas, 2000; Linde et al., 2004; Richman, Loughnan, Droulers Steinbeck & Caterson, 2001) and locus of control (Adolfsson et al., 2005; Klem et al., 2000; Nir & Neumann, 1991, 1995; Paxton & Sculthorpe, 1999; Reicks, Mills, & Henry, 2004) have been linked with successful weight management (Elfhag & Rossner, 2005; Teixeira et al., 2005). It seemed logical, therefore, that these variables would predict weight loss maintenance in post-bariatric surgery patients. Research also suggests that weight loss is associated with improvements in quality of life, (Fontaine & Barosky, 2001; Kolotkin, Crosby, & Williams, 2002) and that factors such as locus of control impact not only weight maintenance but also the adjustment process related to quality of life in post-bariatric surgery patients (Bocchieri et al., 2002). However, because weight loss is so critical in the lives of these individuals it seemed likely that the impact of self-efficacy and locus of control on quality of life would be mediated by their link to weight loss. The research (Bond et al., 2006; Karlsson et al., 1998; Karlsson et al., 2002) supports this finding, as the authors found that higher amounts of weight loss were translated into higher quality of life. Because research indicated that not all post-bariatric surgery patients maintain weight loss (Adami et al., 2005; Dymek, Le Grange, Neven & Alverdy, 2002; Karlsson et al., 1998, Porter & Wampler, 2000; Sabbioni et al., 2001) and that there is need to pay attention to subgroup differences in establishing post-surgery interventions, (Adami et al., 2005) it made sense that degree of self-efficacy, locus of control and differences in quality of life would distinguish
between those who achieved more than 50% of their excess weight loss goal and those who did not.

**Variable List**

Following is a list of how the variables were coded in this investigation:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Continuous</td>
</tr>
<tr>
<td>Gender</td>
<td>(Females=0, Males=1)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Caucasian (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>African American (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>Hispanic (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>American Indian (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>Pacific Islander (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>Asian (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>Other (Not=0, Yes=1)</td>
</tr>
<tr>
<td>Marriage Status</td>
<td>Married (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>Divorced (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>Never Married (Not=0, Yes=1)</td>
</tr>
<tr>
<td></td>
<td>Other (Not=0, Yes=1)</td>
</tr>
<tr>
<td>Level of Education</td>
<td>Continuous</td>
</tr>
<tr>
<td>Pre-Surgery Weight</td>
<td>Continuous</td>
</tr>
<tr>
<td>Pre-Surgery BMI</td>
<td>Continuous</td>
</tr>
<tr>
<td>Height</td>
<td>Continuous</td>
</tr>
<tr>
<td>Current Weight</td>
<td>Continuous</td>
</tr>
<tr>
<td>Current BMI</td>
<td>Continuous</td>
</tr>
<tr>
<td>Expected Weight Loss (pounds)</td>
<td>Continuous</td>
</tr>
<tr>
<td>Percent of Expect Weight Loss</td>
<td>Continuous</td>
</tr>
<tr>
<td>Expected BMI</td>
<td>Continuous</td>
</tr>
</tbody>
</table>
Date of Surgery

Type of Surgery

- Open Gastric Bypass (Not=0, Yes=1)
- Laparoscopic Gastric Bypass (Not=0, Yes=1)
- Laparoscopic Gastric Banding (Not=0, Yes=1)

Pre-Surgery Employment (1 = Not Employed, 2 = Part-time, 3 = Full time)

Post-Surgery Employment (1 = Not Employed, 2 = Part-time, 3 = Full time)

Goal Status (1 = unable to reach maintain, 2 = working on reaching goal, 3 = Met goal and maintaining)

How Successful was Surgery

Weight Efficacy Life-Style Questionnaire (WEL) Total WEL Raw Score (0-180)
- Negative Emotions Scale Raw Score (0-36)
- Availability Scale Raw Score (0-36)
- Social Pressure Scale Raw Score (0-36)
- Physical Discomfort Scale Raw Score (0-36)
- Positive Activities Scale Raw Score (0-36)

Dieting Beliefs Scale (DBS) Total DBS Raw Score (0-96)
<table>
<thead>
<tr>
<th>Scale</th>
<th>Raw Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total IWQOL-Lite</td>
<td>(Range 0-155)</td>
</tr>
<tr>
<td>Physical Functioning Scale</td>
<td>Raw Score (Range 0-55)</td>
</tr>
<tr>
<td>Self-Esteem Scale</td>
<td>Raw Score (Range 0-35)</td>
</tr>
<tr>
<td>Sexual Life Scale</td>
<td>Raw Score (Range 0-20)</td>
</tr>
<tr>
<td>Public Distress Scale</td>
<td>Raw Score (Range 0-25)</td>
</tr>
<tr>
<td>Work Scale</td>
<td>Raw Score (Range 0-20)</td>
</tr>
</tbody>
</table>
CHAPTER IV
RESULTS OF THE STUDY

Results of the research are presented in this chapter, which is organized into two sections. The first section contains descriptive statistics which display the means, standard deviations, frequencies, and first order relationships for all of the relevant variables. The second section, focused on inferential statistics, answers the two overarching research questions posed by this study. The chapter concludes with a summary of the results.

Preliminary Analyses

Data Screening

Data were entered into SPSS version 15. No data were missing and no outliers were found. The data were normally distributed so no transformations were required. Demographic and descriptive statistics were computed. Demographic statistics for the participants were described in Chapter III in the “Participants” section.

Reliability

The reliability of the instruments utilized in this study was relatively high. Both the self-efficacy (WEL) and the quality of life (IWQOL-Lite) were highly reliable with internal reliability estimated .960 and .971, respectively. The reliability was slightly higher for the WEL than reported by Clark (1991). Internal consistency
reliability estimates of the WEL ranged from .70 to .90 with a median of .84 in two studies (Clark et al., 1991). Internal consistency reliability estimates of the IWQOL-Lite ranged from .90 to .96 (Kolotkin & Crosby, 2002; Kolotkin, Crosby, & Kosloski, 2001). The locus of control measure (DBS) had lower but borderline acceptable reliability estimates of .632 (see Table 2). This reliability was equivalent to the reported reliability for the DBS by Stotland and Zuroff, (1990).

Table 2

Cronbach’s Alpha Internal Reliability Estimates of Instruments

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach’s Alpha</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Efficacy (WEL)</td>
<td>0.960</td>
<td>20</td>
</tr>
<tr>
<td>Locus of Control (DBS)</td>
<td>0.632</td>
<td>16</td>
</tr>
<tr>
<td>Quality of Life (IWQOL-Lite)</td>
<td>0.971</td>
<td>31</td>
</tr>
</tbody>
</table>

Note. N refers to the number of items per instrument

Descriptive Statistics

Table 3 presents the descriptive statistics for the participants and the measures used in this study. The average age of the participants who participated in this research was 49.21 years old with an initial average weight of 304.3 pounds. There were three instruments utilized in this investigation. The Weight Self-efficacy Life-Style Questionnaire (WEL) had a mean score of 130.16 and a standard deviation of ± 30.92. Locus of control was measured using the Dieting Beliefs Scale (DBS). The DBS Total test scores ranged from 30 to 77 with a mean of 54.49 and a standard deviation ± 9.16.
Quality of life was measured using the Impact of Weight on Quality of Life Lite Questionnaire (IWQOL-Lite). The quality of life scores ranged from 4.8 to 100 with a mean of 79.1 and a standard deviation of ± 19.21. The mean scores for self-efficacy were consistent with the mean scores obtained by Richman, Loughnan, Droulers, Steinbeck and Caterson (2001) examining obese women enrolled in a 3-month behavior modification weight management program. The mean WEL score on entry was 106.0 ± 30.0 and rose to 126.5 ± 28.4 at completion. The mean scores for the IWQOL-Lite were comparable to those found by Kolotkin, Crosby & Williams (2002) examining quality of life among obese subgroups. The authors reported mean scores across all groups (community volunteers, clinical trials, outpatient weight loss programs, day treatment and gastric bypass patients) to be 69.3 ± 19.9 for women and 77.8 ± 20.4 for men. However, looking at groups individually the authors reported significantly lower IWQOL-Lite mean scores for gastric bypass patients (45.3 ± 22.0 for women and 37.4 ± 22.5 for men). In this investigation, the percent expected weight loss ranged from 23% to 110% with an average of 69% (see Table 3). These findings are slightly higher but consistent with other statistical reports of the mean loss of excessive weight following bariatric surgery reported as 61.2% for all patients, (Grindel & Grindel, 2006).

The WEL, DBS and the IWQOL-Lite were also disaggregated accorded to success level, meaning whether or not surgery patients were successful or unsuccessful in reaching 50% or more of their percent of excess weight loss goal (≥ 50% is considered successful by insurance companies and bariatric accrediting organizations).
Table 3

Descriptive Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Weight</td>
<td>92</td>
<td>157</td>
<td>453</td>
<td>304.30</td>
<td>54.17</td>
</tr>
<tr>
<td>Age</td>
<td>92</td>
<td>28</td>
<td>68</td>
<td>49.21</td>
<td>8.29</td>
</tr>
<tr>
<td>Perceptions of Success</td>
<td>92</td>
<td>2</td>
<td>7</td>
<td>5.90</td>
<td>1.35</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>92</td>
<td>24</td>
<td>180</td>
<td>130.16</td>
<td>30.92</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>92</td>
<td>4.8</td>
<td>100</td>
<td>79.1</td>
<td>19.21</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>92</td>
<td>30</td>
<td>77</td>
<td>54.49</td>
<td>9.16</td>
</tr>
<tr>
<td>Percent of Excess Weight Loss</td>
<td>92</td>
<td>23%</td>
<td>110%</td>
<td>69%</td>
<td>.19</td>
</tr>
</tbody>
</table>

Table 4 displays the results of these disaggregated means. Successful participants had higher mean scores on Quality of Life and Self-Efficacy when compared to their counterparts. Unsuccessful participants scored on average 50.05 on quality of life (IWQOL-Lite), and 98.57 on self-efficacy (WEL), whereas successful bariatric patients scored on average 84.30 on quality of life (IWQOL-Lite) and 135.83 on self-efficacy (WEL). However, the locus of control (DBS) score was higher in participants who were unsuccessful with a mean of 59.43 compared to successful participants with a mean DBS score of 53.6 (see Table 4).
Table 4
Means Disaggregated by Successful Results of Bariatric Surgery

<table>
<thead>
<tr>
<th></th>
<th>Quality of Life Mean</th>
<th>Quality of Life St. Dev.</th>
<th>Self Efficacy Mean</th>
<th>Self Efficacy St. Dev.</th>
<th>Locus of Control Mean</th>
<th>Locus of Control St. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsuccessful</td>
<td>50.05</td>
<td>19.03</td>
<td>98.57</td>
<td>30.74</td>
<td>59.43</td>
<td>7.45</td>
</tr>
<tr>
<td>Successful</td>
<td>84.3</td>
<td>13.93</td>
<td>135.83</td>
<td>27.50</td>
<td>53.6</td>
<td>9.19</td>
</tr>
</tbody>
</table>

A correlation matrix was also computed to investigate the first order relationships between all of the relevant variables. Table 5 presents the correlation matrix. There was a significant correlation between self-efficacy, quality of life and percent excess weight loss at the p < .01 level and r = .499 and .549, respectively. Quality of life was negatively correlated with locus of control with an r = -.252 and p < .05 level and positively correlated with percent excess weight loss (r = .6 and p < .01). Locus of control was negatively correlated with percent excess weight loss (r = -.247) at the .01 level (see Table 5). Overall the correlations were low to moderate. All were in the expected direction with the exception of the negative correlations with locus of control.
Table 5

Correlations

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Self-Efficacy</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(2) Quality of life</td>
<td>.499**</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(3) Locus of Control</td>
<td>-.132</td>
<td>-.252*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(4) Percent of Expected Weight</td>
<td>.549**</td>
<td>.600**</td>
<td>-.247*</td>
<td>-</td>
</tr>
<tr>
<td>Loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: * Significant at an alpha of .05
** Significant at an alpha of .01

*Primary Analysis*

This section reviews the statistical results as well as presents the findings in table form for the research hypotheses.

*General Hypothesis 1 (GH1):* The prediction of quality of life variables as measured by the IWQOL-Lite total score, by the social cognitive variables of global weight self-efficacy as measured by the WEL and weight locus of control as measured by the total score of the DBS will be mediated by the amount of weight loss post-bariatric surgery.

This hypothesis was tested using multiple regression procedures and the Baron and Kenny (1986) model for testing mediation. Figure 3 presents a graphic representation of the test for mediation outlined by Baron and Kenny (1986).
This procedure was conducted in four steps. The first step investigated the relationship between the self-efficacy and locus of control and quality of life. (See path a1 and a2 on Figure 3 stage 1.) The second step tested the relationship between the self-efficacy, locus of control and the mediating variable, percent excess weight loss (See path a1 and a2 on Figure 3 stage 2). The third step tested the relationship between the mediating variable, (percent excess weight loss) and quality of life. (See path b1 on Figure 3 stage 2.) Finally, in step four the amount of unique variance accounted for by self-efficacy and locus of control in predicting quality of life while controlling for the mediating variable of percent of excess weight loss was
investigated. (See path c1 and c2 while controlling for b1 and a1 and a2 on Figure 1 stage 2.). For these steps both the full and restricted models are presented. All hypotheses were tested with a significance level of .05. See Figure 3 for a graphic representation of the test for mediation outlined by Baron and Kenny (1986).

The results for steps one through four and their specific hypotheses are described below and the data are presented in Table 6 and 7.

*Step One*

Specific Hypothesis 1a (SH1a). There is a significant relationship between self-efficacy (WEL) and locus of control (DBS) in predicting quality of life (IWQOL-Lite).

**Full Model:** $\text{IWQOL-Lite} = \beta + \beta_1(WEL) + \beta_2(DBS) + \epsilon$

**Restricted Model:** $\text{IWQOL-Lite} = \beta + \epsilon$

This hypothesis was found to be significant $[F_{(2),(89)} = 17.644 \ p < .001]$. Twenty-eight percent of the variance in IWQOL-Lite was accounted for by the WEL and DBS ($R^2 = .284$). Both the WEL ($t = 5.23$) and the DBS ($t = -2.095$) account for a significant proportion of unique variance in predicting IWQOL-Lite with significance levels $< .001$ and $.038$, respectively. The proportion of unique variance accounted for by the WEL was 23.52% and by the DBS 4.7% (see Table 6, Analysis 1).

*Step Two*

Specific Hypothesis 1b (SH1b) There is a significant relationship between self-efficacy (WEL) and locus of control (DBS) in predicting percent of excess weight Loss (% EWL).
Full Model: \( \% \text{EWL} = \beta + \beta_1(\text{WEL}) + \beta_2(\text{DBS}) + \varepsilon \)

Restricted Model: \( \% \text{EWL} = \beta + \varepsilon \)

This hypothesis was found to be significant with an \( F(2,89) = 22.134, \) \( p < .001 \). This model accounted for thirty-three percent of the variance in predicting \( \%\text{EWL} \) (\( R^2 = .332 \)). Both the WEL (\( t = 6.01 \)) and the DBS (\( t = -2.94 \)) account for a significant proportion of unique variance in predicting \( \% \text{EWL} \) with significances levels < .001 and .045, respectively (see Table 6, Analysis 2). The unique variance accounted for by the WEL was 28.8% and 4.45% by the DBS.

**Step Three**

Specific Hypothesis 1c (SH1c) There is a significant relationship between percent of excess weight loss and quality of life (IWQOL-Lite).

Full Model: \( \text{IWQOL-Lite} = \beta + \beta_1(\%\text{EWL}) + \varepsilon \)

Restricted Model: \( \text{IWQOL-Lite} = \beta + \varepsilon \)

This hypothesis was significant \( F(1,90) = 50.517, p < .001 \). Thirty-six percent of the variance in IWQOL was accounted for by the full model (\( R^2 = .36 \)) (see Table 6, Analysis 3).

**Step Four**

Specific Hypothesis 1d (SH1d): Self-efficacy (WEL) and locus of control (DBS) account for a significant proportion of unique variance in predicting quality of life (IWQOL-Lite) while controlling for the mediating variable of percent of excess weight loss (\( \% \text{EWL} \)).
Table 6

Specific Research Hypothesis 1a-c: The relationships between Self-Efficacy (WEL), Locus of Control (DBS), Percent of Excess Weight Loss (% EWL) and Quality of Life (IWQOL-Lite).

<table>
<thead>
<tr>
<th>Analysis and Predictor Variables</th>
<th>B</th>
<th>SE</th>
<th>R²</th>
<th>t</th>
<th>F</th>
<th>Sig</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis 1</td>
<td></td>
<td></td>
<td>0.284</td>
<td></td>
<td>17.644**</td>
<td>&lt;.001</td>
<td>IWQOL Lite</td>
</tr>
<tr>
<td>WEL</td>
<td>.474</td>
<td>0.056</td>
<td></td>
<td>5.234**</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBS</td>
<td>-.190</td>
<td>0.190</td>
<td></td>
<td>-2.095*</td>
<td>0.038</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis 2</td>
<td></td>
<td></td>
<td>0.332</td>
<td></td>
<td>22.143**</td>
<td>&lt;.001</td>
<td>Percent of EWL</td>
</tr>
<tr>
<td>WEL</td>
<td>.535</td>
<td>0.001</td>
<td></td>
<td>6.012**</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBS</td>
<td>-.178</td>
<td>0.002</td>
<td></td>
<td>-2.937*</td>
<td>0.045</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis 3</td>
<td></td>
<td></td>
<td>0.360</td>
<td></td>
<td>50.517**</td>
<td>&lt;.001</td>
<td>IWQOL Lite</td>
</tr>
<tr>
<td>Percent of EWL</td>
<td>.600</td>
<td>8.670</td>
<td></td>
<td>7.108**</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. * Significant at an alpha of .05
** Significant at an alpha of .01

Full Model: IWQOL-Lite = β + β1(WEL) + β2(DBS) + β3(%EWL) + ε

Restricted Model: IWQOL-Lite = β + β4(%EWL) + ε

Table 7 presents the results. The full model, in which self-efficacy and locus of control predicting quality of life while controlling for percent of excess weight loss was significant [F change(2)(88) = 3.955, p = .023]. These two variables accounted for 5.3% of the unique variance in quality of life over and above the variance accounted for by percent of excess weight loss (R² change = .053). This is the C – C1 process described in Baron and Kenny (1986). In this study C = .414 and C1 = .36. The difference, the unique variance accounted for by WEL and DBS is 5.3%. However, only self-efficacy accounted for a significant proportion of unique variance in predicting quality of life (IWQOL-Lite) with a significance level of .015 (see Table 7). The proportion of
unique variance accounted for by the % EWL was 17.89%, the proportion of unique variance accounted for by self-efficacy (WEL) was 6.55%, and the proportion of unique variance accounted by locus of control (DBS) was 1.96%.

Table 7

Specific Hypothesis 1d: WEL and DBS Account for a Significant Proportion of Unique Variance in Predicting IWQOL Lite While Controlling for % EWL

<table>
<thead>
<tr>
<th>Step and Predictor Variables</th>
<th>B</th>
<th>SE</th>
<th>R²</th>
<th>R² Change</th>
<th>F Change</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of EWL</td>
<td>.600</td>
<td>8.67</td>
<td>0.36</td>
<td></td>
<td>50.517**</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of EWL</td>
<td>.439</td>
<td>10.278</td>
<td>0.412</td>
<td>0.053</td>
<td>3.955*</td>
<td>0.023</td>
</tr>
<tr>
<td>WEL</td>
<td>.243</td>
<td>0.061</td>
<td></td>
<td></td>
<td></td>
<td>0.015</td>
</tr>
<tr>
<td>DBS</td>
<td>-.112</td>
<td>0.177</td>
<td></td>
<td></td>
<td></td>
<td>0.189</td>
</tr>
</tbody>
</table>

Note: * Significant at an alpha of .05
      ** Significant at an alpha of .01

General Hypothesis 2(GH2): There will be significant differences in post-bariatric surgery patients between those who lose more than 50% of their excess weight loss goal and those who lose less than 50% of their excess weight loss goal on weight self-efficacy (as measured by the WEL total score), weight locus of control (as measured by the DBS total score), and quality of life (as measured by the IWQOL-Lite total score).

Step one of this analysis was to test the overall significance of the ability of self- efficacy (WEL), locus of control (DBS) and quality of life (IWQOL-Lite) to discriminate between successful and unsuccessful post-bariatric surgery groups. The overall Wilks’ Lambda was significant \[\lambda = .563, \chi^2_{(3)} = 50.8, p < .001\] (see Table 8). There is a reliable separation of the groups on these variables.
Table 8

The Summary of the Canonical Discriminate Function and Wilks’ Lambda

<table>
<thead>
<tr>
<th>Function</th>
<th>Eigenvalue</th>
<th>% of Variance</th>
<th>Canonical Correlation</th>
<th>Wilks' Lambda</th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.775</td>
<td>100</td>
<td>0.661</td>
<td>0.563</td>
<td>50.800</td>
<td>3</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Step two investigated the significance of the independent variables of self-efficacy, quality of life and locus of control. All three of the independent variables were significant contributors to discriminating between successful and unsuccessful bariatric surgery group results. The Wilks’ Lambda ranged from a high of .947 for locus of control to a low of .585 for quality of life. The significance values also ranged from .028 to less than .001, respectively (see Table 9).

Table 9

Test Equality of Group Means

<table>
<thead>
<tr>
<th>Variables</th>
<th>Wilks’ Lambda</th>
<th>F</th>
<th>df₁</th>
<th>df₂</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Efficacy</td>
<td>0.811</td>
<td>21.030</td>
<td>1</td>
<td>90</td>
<td>0.000</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>0.585</td>
<td>63.761</td>
<td>1</td>
<td>90</td>
<td>0.000</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>0.947</td>
<td>5.015</td>
<td>1</td>
<td>90</td>
<td>0.028</td>
</tr>
</tbody>
</table>

The step three demonstrated the correlations of each variable with the discriminate function. Table 10 shows the loadings of Quality of Life, Self Efficacy
and Locus of Control. The loadings are Quality of Life .959, Self Efficacy .549 and Locus of Control -.268 (See Table 10).

Table 10

Structure Matrix

<table>
<thead>
<tr>
<th>Variables</th>
<th>Function 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Life</td>
<td>0.959</td>
</tr>
<tr>
<td>Self Efficacy</td>
<td>0.549</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>-0.268</td>
</tr>
</tbody>
</table>

Step four demonstrates the overall classification ability for the discriminate function. This discriminate function worked equally well for identifying successful and unsuccessful post-bariatric patient groups. If a patient was unsuccessful the discriminate function correctly identified 12 of the 14 times (85.71%). If a patient was successful the discriminate function identified them correctly 70 of the 78 times (89.74%). This discriminate function overall correctly identified 82 of the 92 (89.1%) bariatric patients (see Table 11).

Table 11

Classification Results

<table>
<thead>
<tr>
<th>Predicted Group</th>
<th>Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsuccessful</td>
</tr>
<tr>
<td>Original</td>
<td>12 (85.71%)</td>
</tr>
<tr>
<td></td>
<td>8 (10.26%)</td>
</tr>
</tbody>
</table>

Note. 89.1% of the original grouped cases correctly classified
Summary of Quantitative Research

All of the research hypotheses were significant. There was a significant relationship between self-efficacy, locus of control, percent of expected weight loss and quality of life. These results indicated that the percent of expect weight loss was a mediating variable in predicting quality of life. Despite the mediating effects of percent of weight loss, self-efficacy and locus of control did account for a significant portion of unique weight loss. Quality of life, self-efficacy and locus of control significantly differentiated between successful and unsuccessful bariatric surgery outcomes (see Table 12).

Table 12

Summary Table

<table>
<thead>
<tr>
<th>Model</th>
<th>Hypotheses</th>
<th>p</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH1a</td>
<td>There is a significant relationship between self-efficacy (WEL) and locus of control (DBS) in predicting quality of life (IWQOL-Lite).</td>
<td>&lt;.001</td>
<td>Yes</td>
</tr>
<tr>
<td>SH1b</td>
<td>There is a significant relationship between self-efficacy (WEL) and locus of control (DBS) in predicting percent of excess weight loss (% EWL).</td>
<td>&lt;.001</td>
<td>Yes</td>
</tr>
<tr>
<td>SH1c</td>
<td>There is a significant relationship between percent of excess weight loss (%EWL) and Quality of Life (IWQOL-Lite).</td>
<td>&lt;.001</td>
<td>Yes</td>
</tr>
<tr>
<td>SH1d</td>
<td>Self-efficacy (WEL) and locus of control (DBS) account for a significant proportion of unique variance in predicting quality of life (IWQOL- Lite) while controlling for the mediating variable of percent of excess weight loss (% EWL).</td>
<td>.023</td>
<td>Yes</td>
</tr>
<tr>
<td>GH2</td>
<td>There will be significant differences in post-bariatric surgery patients between those who lose more than 50% of their excess weight loss goal and those who lose less than 50% of their excess weight loss goal on weight self-efficacy (as measured by the WEL total score), weight locus of control (as measured by the DBS total score), and quality of life (as measured by the IWQOL-Lite total score).</td>
<td>&lt;.001</td>
<td>Yes</td>
</tr>
</tbody>
</table>
CHAPTER V
SUMMARY, CONCLUSIONS, AND IMPLICATIONS

This chapter focuses on analysis of the results of this investigation and is divided into four sections: study overview, conclusions, implications of findings, and recommendations for future research. Included in the overview are a brief restatement of the problem, a review of the procedures used in conducting the study, and the research hypotheses. The conclusion section examines the research findings from each of the general and specific research hypotheses and highlights the significance of the research findings. Section three presents a discussion of the implication of the findings. The final section concludes with recommendations for future research.

Overview of the Study

This study investigated the relationships between self-efficacy, locus of control, weight loss, and quality of life of participants following bariatric surgery. In addition, the variables of self-efficacy, locus of control, weight loss, and quality of life were assessed in relation to weight and a priori defined successful and unsuccessful post-surgery weight loss. All of the research hypotheses were supported by the findings. There were significant relationships between self-efficacy, locus of control, percent excess weight loss, and quality of life. The percent excess weight loss was established as a mediating variable in predicting quality of life. Additionally, self-efficacy, locus
of control, and quality of life significantly differentiated between successful and unsuccessful post-bariatric surgery groups.

Conclusions and Discussion

Research has shown that perceived self-efficacy, locus of control, and bariatric surgery to be important factors related to weight loss and quality of life (Adami, Ramberti, Weiss, Carlini, Murelli, & Scopinaro, 2005; Clark, Abrams, Niaura, Eaton, & Rossi, 1991; Dymek, leGrange, Neven, & Alverdy, 2002; Fountaine & Barofsky, 2001). Research findings support the relationship of cognitive variables in predicting successful behavioral change (Bandura, 1992, 1997, 2000; Elfhag & Rossner, 2005; Richman, Loughnan, Droulers, Steinbeck, & Caterson, 2001; Teixeira, Going, Sardinha, & Lohman, 2005). Self-efficacy and locus of control are beliefs about one’s personal capabilities and abilities to affect outcomes respectively. In light of the challenges that are faced by bariatric patients following surgery (Bocchieri, Meana, & Fisher, 2002), the significance of examining the relationship of perceived ability to influence behavior related to quality of life was important to address. Moreover, there are few empirical studies relating self-efficacy, locus of control, weight loss, and quality of life to bariatric surgery outcomes. The majority of research on weight-related self-efficacy and weight-related locus of control has addressed eating behaviors, weight loss, and weight loss maintenance in obese and nonclinical populations following weight loss treatment. Few empirical studies have related these constructs to the post-bariatric surgery population. Additionally, the majority of studies have independently examined constructs such as self-efficacy or locus of control rather than taking into account the potential interaction between constructs.
when attempting to predict weight loss and weight loss maintenance. Therefore, this study focused on answering some questions left unanswered in the literature as to the importance of identifying variables that correlate with successful weight loss and quality of life in the bariatric population. Combining the variables self-efficacy, locus of control, and quality of life provided a comprehensive model of cognitive predictors of post-bariatric surgery weight loss.

Hypothesis 1a, which was supported by the findings, predicted that self-efficacy and locus of control would account for a significant proportion of the variance in excess weight loss. These findings were in consonance with those reported by Elfhag and Rossner (2005) and Teixeira et al. (2005). Although both variables accounted for a significant portion of the variance in excess weight loss, self-efficacy contributed the greatest proportion of variance. This was predicted by Bandura’s (1986, 1997) social learning theory. First, several researchers have found that self-efficacy is related to positive health behaviors associated with weight loss (Berman, 2006; Kitsantas, 2000; Linde et al., 2004). Second, self-efficacy has been shown to be a precursor to many self-improvement behaviors, such as smoking cessation, successful job search, and so forth (Bandura, 1997). That locus of control would be less predictive of weight loss than self-efficacy is not surprising. Whereas, self-efficacy assesses self-perceptions of abilities to take a course of action and maintain it, locus of control assesses perceptions of how much control people have over the forces that influence their lives. All human beings, no matter how efficacious they are, are subject to happenstance and historical forces over which they have absolutely no control. People may believe that their lives are in the hands of chance or God;
however, they can simultaneously believe that God helps those who help themselves and chance has nothing to do with the reality of the outcome. Therefore, the relationship between locus of control and excess weight loss would be expected to be attenuated. These findings support, in part, those of Stotland and Zuroff (1990) who developed the DBS. In their study composed of normal weight women, internality correlated significantly with higher weight, perceptions of being overweight, binge eating tendencies a propensity to diet and weight fluctuations. Zotland and Zuroff (1990), concluded that these tendencies may have contributed to the “feeling that they should diet and should be able to control their weight and to the adoption of internal beliefs about weight control” (p. 201).

What is surprising is that weight locus of control was negatively related to weight loss and quality of life. This finding is counterintuitive and in the opposite direction that was anticipated. In this study, post-bariatric surgery patients who exhibited more externality in locus of control achieved greater weight loss than those who had a more internal locus of control. The data were examined to make sure that coding was appropriate; data from the creators of the scale indicate sufficient tests of reliability and validity. Therefore, what follows is speculative.

Obesity, in part, can be viewed as a food addiction. In virtually all 12 Step programs designed for addictions—alcohol, drugs, gambling, sex—the first step in recovery is to admit powerlessness over the addiction. The second step is to believe in a greater power than oneself; the third step is to turn one's will and one's life over to that greater power. Put succinctly, the first step in addiction recovery is to relinquish control. The psychological principle underlying the relinquishing of control is to
remove oneself from the cycle of good intentions, failure, and blame. Food addiction, especially for patients who are severely obese, has serious physical and psychological consequences. The findings suggest that those who are more internal are less successful in weight loss than those who are more external in their locus of control. The findings suggest that those who have more internal locus of control may be more likely to self blame. They may also be less willing or capable of seeking outside help for their addictive behavior. They may have been less involved in a 12 Step program such as Overeaters Anonymous that encourages them to relinquish personal control and call on a higher power to help them. These findings suggest that those who lost more weight had an external locus of control. Perhaps external locus of control is more influenced by social support, or stigma, or peer pressure to maintain a lower weight. These speculations could be addressed in future studies.

The inverse relationship between internal locus of control and weight loss among post-bariatric surgery patients raises a host of questions. Is this relationship artifactual or does it reflect real-world experience? Can this relationship be replicated in this and other populations associated with addictions? If this relationship is empirically valid, why do those who externalize lose more weight than those who have an internal locus of control? Did the participant who lost more weight participate in support groups? Perhaps an alternate explanation of the inverse relationship between internal locus of control and weight loss speaks to the value attributed to weight loss among post-bariatric surgery patients. Rotter (1975) emphasized the need to consider the value placed on the reinforcement or outcome when attempting to use locus of control as a predictor. The implication of this finding is that the percent or amount of
weight loss may not be the most valued outcome of bariatric surgery. Perhaps having greater mobility, decreased pain, improved self-esteem, or discontinuing medications due to improved/resolved medical conditions, and generally feeling better may be more valued than percent of weight loss to the post-bariatric patient.

Hypothesis 1b, which was supported by the findings, indicated that self-efficacy, locus of control and percent of excess weight loss (%EWL) are relevant in predicting quality of life in adult post-bariatric surgery participants. The results indicated that the percent of excess weight loss was a mediating variable in predicting quality of life. Therefore, self-efficacy and locus of control appear to have a greater direct impact on percent of excess weight loss than on quality of life for post-bariatric surgery patients. Additionally, self-efficacy and locus of control in combination accounted for a significant portion of unique variance in predicting quality of life.

The findings on percentage of weight loss in quality of life, serving as a mediating variable replicate those found by previous researchers (Fontaine & Barofsky, 2001; Karlsson, Sjostrum, & Sullivan, 1998; Klem et al., 2000; Kolotkin, Crosby, & Williams, 2002). As noted by Fontaine and Barofsky (2001), improved quality of life, especially physical functioning, seems to be the most important benefit of weight loss following bariatric surgery. However, this study answers two questions that have not been addressed in the research on weight loss among post-bariatric patients. First, to what extent does percent of excess weight loss mediate the role locus of control and self-efficacy play in influencing quality of life for post bariatric surgery patients? Second, to what extent do locus of control and self-efficacy predict quality of life independent of weight loss? The two variables collectively accounted for 28% of the
variance in quality of life. When percent of excess weight loss was entered into the
equation, it explained 36% of the variance in quality of life; the two cognitive variables
accounted for an additional 5% of the variance, which was significant. However, when
examined individually, locus of control did not account for a significant portion of
variance once weight loss was controlled. This suggests that the influence of locus of
control on quality of life is indirect through its influence on weight loss. However,
self-efficacy contributes both directly and indirectly (through percent of excess weight
loss) on quality of life of post-bariatric patients.

Lefcort, (1984), Neumann, (1995), and Wallston, Wallston, Kaplan, & Maides,
(1976) suggested that locus of control, and by extension, self-efficacy, do not influence
weight control independently, but reflect the support structures that create a positive
context for weight control. In this study, both variables had direct effects on weight
loss. Support structures may be able to influence locus of control and self-efficacy;
however, this issue was not investigated in this study since social support was not
included in the regression analyses. Future research needs to more carefully parcel out
the relationship between social support and self-efficacy and locus of control on weight
loss. It is also important to note that their relationships with quality of life were
mediated by weight loss, although there also was evidence of some direct effects of
self-efficacy on quality of life.

The findings of the study indicated a significant relationship between percent of
excess weight loss and quality of life, with percent of excess weight loss accounting for
36% of the variance in quality of life. This finding is consistent with studies
examining relationships of weight loss and quality of life following bariatric surgery
Hypothesis 2 suggested that there would be significant differences in post-bariatric surgery patients between those who lose more than 50% of their excess weight loss goal and those who lose less than 50% of their excess weight loss goal on weight self-efficacy, weight locus of control, and quality of life. The findings from this study reveal that those who achieve the goal of more than 50% of their excess weight loss goal had higher quality of life, higher levels of self-efficacy, and tended to be more external in their locus of control. This finding adds to our understanding of differences in subgroups of bariatric surgery patients from a social cognitive perspective. The combination of having confidence that one can resist the desire to eat in a variety of situations (high self-efficacy) coupled with an external locus of control (in which one believes genetics, or the need for encouragement from others or the role that chance plays in their ability to lose weight) distinguishes those who have lost more than 50% of their excess weight loss goal. Examining the role of locus of control in samples of obese and nonobese samples, Mills and Cullen (1993) found greater internality for obese participants having no history of family obesity versus obese participants with a history of family obesity. Therefore the finding in this study that those who lost more weight had higher self-efficacy but lower internal locus of control may reflect a family history of obesity and the role genetics played in their difficulty in previous weight loss attempts. Attributing power to genetics is one item on the locus of control scale indicating an external sense of control. It is important that the relationship of locus of
control, self-efficacy, weight loss, family history of obesity and genetic factors be explored further in future research.

Although the findings of the study were robust, they were limited by the fact that the sample included volunteers from a single bariatric surgery program located within a community teaching hospital in Cleveland, Ohio. Therefore, the findings cannot be generalized to a national population. Additionally, the study did not include a pre-test so it was not possible to measure whether self-efficacy or locus of control remained constant or if there were fluctuations in quality of life over time.

Implications for Practice

The study findings appear to have several possible implications for programs, treatment planning and for clinical practice. Patient education is an essential role of health care providers. Individuals considering bariatric surgery frequently report being overwhelmed with the amount of information they must process about weight loss surgery. Patients must be informed of the risks and benefits of various types of surgical procedures, as well as the physical and psychosocial challenges they face following surgery. An objective of patient education is to provide information that empowers the patient with knowledge and skills to make informed decisions about health related behavior.

The current study addresses the gap in the literature by bridging the theoretical concepts of social learning theory with bariatric surgery outcomes. Regarding clinical practice, program and treatment planning, the WEL the DBS and IWQOL-Lite are instruments that are easy to complete, score, and provide valid and reliable information. These instruments could be used as screening instruments both pre and
post-bariatric surgery. Additionally, the inventories could be used to design more responsive programs providing education, clinical interventions, and support service components tailored to the overall and specific needs of bariatric surgery patients. Providing patient education and support designed to meet the individualized needs of the bariatric patient is essential to effective health care delivery. Due to the task and situation-specific nature of self-efficacy, pre and post-surgery education focusing on increasing patient’s self-efficacy in reported behavioral areas where they experience difficulty could help address patients’ specific needs.

The findings of the study have several implications for psycho-educational practice prior to and following bariatric surgery. First, because self-efficacy is related to both weight loss and quality of life, such programs should focus on building a patient's self-efficacy. There are a number of ways in which this can be done: first, as with Weight Watchers and other self-help programs, participants work on alternative ways to think about their problems that may help them approach it from a different perspective; second, programs can provide suggestions, either through the leader or through group discussion, of different ways of approaching and solving problems; third, such programs can lead members in developing problem-solving skills that would help them become more efficacious in coping with problems.

A requirement for eligibility for bariatric surgery should be participation in both individual professional counseling and a self-help group counseling conducted either by hospital staff or a voluntary association like Overeaters Anonymous. These research findings on locus of control suggests that bariatric surgery participants who seem to follow the precepts of 12 Step programs by relinquishing personal control over
their addictions are likely to have greater success post surgery than those who do not. Obesity is a disorder that isolates the individual. Persons who are obese are stigmatized and often face rejection in the larger society. Some of the great benefits of self-help groups are that they act as a bulwark against such social isolation, they provide people who are stigmatized common ground with others who have experienced similar discrimination, and they provide a community of people who will support them in their efforts to overcome destructive behaviors.

Clinical experience suggests the need for counseling and psychological support both pre and post-bariatric surgery. In addition to group counseling and support, pre and post-surgical individual counseling may be instrumental for long term postsurgical success focused on helping patients establish a balance of internal and external control beliefs (enabling them to believe that weight loss is under their control yet leaving them amenable to the guidance of health professionals) while increasing self-efficacy related to weight loss behaviors.

Recommendations for Future Research

This study focused on social cognitive and social learning variables, specifically self-efficacy and locus of control as predictors of quality of life and weight loss as they apply to adult post-bariatric surgery patients. Success following surgery was also assessed in relationship to social learning constructs and quality of life. This investigation represents an attempt to understand the interrelated, complex, and multifaceted influences on bariatric surgery outcomes. The following is a list of suggestions that may be of benefit to future researchers. These suggestions are not
placed in order of importance and the recommendations are not intended to be all inclusive:

1. The population utilized in this study was limited to a one time post-surgery testing of bariatric surgery adults. A longitudinal study, perhaps testing a cohort pre-surgery and post surgery at multiple time frames may help capture a clearer picture of the trajectory of self-efficacy and locus of control outcome beliefs at different periods of time in relation to weight loss and quality of life. This may provide a better understanding and tracking of cognitions and selected behaviors that inhibit or enhance long term success.

2. The study participants were recruited from one hospital in Northeast Ohio. Perhaps implementing a multi-site approach to include bariatric clinics and hospitals in varying locations would yield a larger sample size, a more heterogeneous population and help address gender, racial, and ethnic differences. A multi-site study could also provide additional outcome information that may vary based on additional types of procedures performed at other sites.

3. This study examined the relationship of self-efficacy, locus of control, and quality of life using the composite global self-efficacy score, and the composite quality of life. To further examine the relationship among these constructs examining all subscales of the WEL and the IWQOL-Lite may provide more information regarding the strengths and weaknesses of cognitive behavioral mechanisms related to control over eating and specific information about physical and psychological areas that influence quality of life.
4. Future researchers may want to address the limitations of the underrepresentation of men in bariatric research populations. It may be of benefit to actively recruit and design a study examining cognitive variables, weight loss and quality of life with a sample of male participants so as to address gender specific areas of concern and issues most relevant to males.

5. There is a lack of ongoing supportive services for bariatric patients following surgery. A pilot study designed to include pre and post-surgery psychoeducation and psychosocial counseling focused on increasing self-efficacy and coping behaviors for a minimum period of treatment of 2 years. Additionally such a study could explore successful outcomes based on continued weight loss maintenance, cognitive variables and quality of life in a cohort receiving ongoing treatment and a matched group receiving no treatment.

6. Of great interest is the finding that external locus of control was positively related to weight loss. This was an unexpected finding, although supported by anecdotal evidence. However, more research needs to be conducted in the relationship between locus of control and success in weight loss. A number of questions remain unanswered about this relationship. For example, among people who are not obese but are overweight, what is the relationship between locus of control and weight loss? The concept of giving up control is central to all 12 Step programs. Can the findings of this study be replicated in persons attending 12 Step programs? What role does family and or social support play in the relationship between weight loss and locus of control. What is the subjective experience of post-bariatric surgery patients who successfully lose weight?
7. Further research focusing on treatment modalities could address the role of individual counseling versus group treatment pre and post-bariatric surgery. A question that should be addressed is, can internal and external control beliefs be modified in both modalities, or better reinforced in one modality versus the other (group versus individual treatment)?

Summary

This study advances our knowledge in several ways. First, this study adds to the paucity of research focused on cognitive predictors of bariatric surgery success. Second, this study extends the application of multiple social learning constructs to the field of bariatric health care. Finally, the analysis moves beyond single measures of success based on %EWL to include a more complete understanding of the participants’ reported perception of their success. These findings may benefit bariatric patients, mental health professionals, and hospitals/clinics that provide bariatric services. The findings of this study may help to inform and foster a multidimensional facet of participants’ perception of their success and quality of life. Additionally, a better understanding of the relationship among the variables of self-efficacy, locus of control, weight loss and quality of life as they relate to the bariatric population provides groundwork for the development of specific interventions to improve outcomes and adjustment following surgery.
REFERENCES


118


121
APPENDICES
APPENDIX A

BARIATRIC OUTCOMES


123
APPENDIX B

TYPES OF GASTRIC BYPASS SURGERY

FIGURE 1-A Vertical banded gastroplasty. The stomach is stapled front to back, below the gastroesophageal junction, cutting a hole, and then partitioned vertically along its lesser curvature. The elongated esophagus terminates midway along the lesser curvature of the stomach. The outlet stoma is restricted with a 1cm diameter polypropylene band. This is a restrictive procedure.

FIGURE 1-B Adjustable gastric banding: This gastric restrictive procedure, performed laparoscopically, inserts a gastric ring with an inflatable pouch, placed subcutaneously. The hollow band around the upper stomach creates a small gastric pouch with a narrow access to the larger, more distal stomach. Inflating the band with saline allows for later adjustment on the constriction, tailoring the restriction to the needs of the patient in terms of their weight loss and nutritional status. This is a restrictive procedure that is adjustable and often performed laparoscopically.
FIGURE 1-C Roux-en-Y gastric bypass: Stapling across the stomach creates a small proximal pouch (20–40 cm), which empties into a segment of lower jejunum that is brought up as a Roux-en-Y limb and empties some 40 cm into the biliopancreatic limb. This latter extension of the duodenum and proximal jejunum carry the digestive juices to the common limb where digestion and absorption occurs. There are therefore restrictive and malabsorptive components.
FIGURE 2-A Biliopancreatic diversion employs a long Roux limb and a rather long biliopancreatic limb of the small bowel. The common channel where digestive juices and ingested food mix is rather short (about 50cm), limiting digestion and absorption. The gastric pouch is about 200ml.
FIGURE 2-B  Bilio-pancreatic diversion with a duodenal switch: The duodenal switch is a modification of the Bilio-pancreatic diversion in which 60% of the greater curvature of the stomach is removed and the proximal duodenum is transected and the anastomosed (end-to-side) to the distal intestine, 250 cm proximal to the ileocecal valve.
APPENDIX C

INTRODUCTION LETTER

I recently spoke with you about participating in a research study to be conducted at The Cleveland Center for Bariatric Surgery (CCBS). I am a graduate student at The University of Akron working on a doctoral dissertation. The purpose of this study is to investigate beliefs and perceptions which may influence adjustment following bariatric surgery. The results of this study could be used to improve knowledge about eating behaviors following bariatric surgery and to help people be more successful in their weight loss efforts.

Your involvement in this study if you decide to participate consists of completing four brief questionnaires that should take about 30 minutes to complete. I have included an addressed postage paid return envelope for the questionnaires.

Participation in the study is greatly appreciated but is completely voluntary. Your involvement in this study has no effect on your medical care at the Cleveland Center for Bariatric Surgery.

All information will be coded to guarantee confidentiality and your questionnaires will be assigned a code number. Please read, sign, and put your name and date on the consent form if you wish to participate and complete the questionnaires. Please return the packets with the completed questionnaires and consent form in the postage paid envelopes within the next two weeks.

If you have any questions regarding this study please contact the investigator: Jane Fink 330 321-9733 or by email at jfink@uakron.edu. Thank you for your time and participation in this research study.

Jane Fink
APPENDIX D

INFORMED CONSENT TO PARTICIPATE IN THE STUDY

Statement of Research
You are being invited to participate in a research study. You were selected as a potential participant because you have had surgical treatment for weight loss, and you have previously given your permission to be contacted for research opportunities. Participation in this study is voluntary and is not connected in any way with your past, present, or future medical care at The Cleveland Center for Bariatric Surgery or St. Vincent Charity Hospital.

Information on the Research
The purpose of this research is to learn more about the long-term outcomes (18 months or more post-surgery) related to quality of life following bariatric surgery. Specifically, we want to learn more about the needs of people who have had bariatric surgery and about how to improve support after surgery. We are asking 150 individuals, who are at least 18 months or longer post-bariatric surgery, to participate in this study.

Procedures
If you take part in this study, you will be asked to complete four questionnaires. The questionnaires ask you how you feel about yourself and your life now, and what you think about eating and weight gain or loss. It will take approximately 30 minutes of your time to complete all four questionnaires. You are asked to return the completed questionnaires in the pre-addressed postage-paid envelope within two weeks of receiving the packet. The answers you provide will not become part of your medical record, since the research is separate from your medical care.

Potential Risks
Risks of participating in this study may include feeling mildly uncomfortable or distressed caused by answering questions about personal issues related to your weight, eating patterns, and how you feel about yourself. Should you experience any negative feelings please consider attending the CCBS ongoing support group for all pre and post bariatric surgery patients.
**Potential Benefits**
If you participate in this study there is no direct benefit to you. We hope that the information learned from this study will benefit other patients considering or electing to have weight loss surgery in the future.

**Compensation and Costs**
You will receive no payment or any other kind of compensation for taking part in this study. There is no cost to you or your insurance company for taking part in this study.

**Confidentiality**
The researcher will make every effort to keep personal information in the research records confidential but absolute confidentiality cannot be guaranteed. All of your personal information and your completed questionnaires will be kept in locked files and will be kept confidential to the extent permitted by law. This is a research study involving The Cleveland Center for Bariatric Surgery of St. Vincent Charity Hospital and a researcher from the University of Akron.

The Health Insurance Portability and Accountability Act (HIPAA) law protects your individually identifiable information (protected health information, also called PHI). This law requires you to sign an authorization in order for researchers to be able to use or disclose your PHI for research purposes. By signing this consent you agree to permit the Cleveland Center for Bariatric Surgery to disclose your protected health information to the researcher, Jane Fink, for the purposes of this study only. Protected health information, for example, includes information like your date of birth, height, weight loss goal, BMI and surgery date.

A summary of the results of this research study (created by pooling all of the answers from the questionnaires) will be provided to medical staff of the Cleveland Center for Bariatric Surgery so that the information you provide can help improve services for other bariatric surgery patients. Your individual information will not be shared with the medical staff, and your individual information will not be identifiable in the summary.

The questionnaires are coded with a number to assure confidentiality. Your name will not be used, only the code that has been assigned to each information packet. Information from this study may be used in scientific publications or presentations without any identifying information.

**Voluntary Participation**
Your participation in this study is voluntary. You may choose to participate or not to take part. You may refuse to answer any questions or withdraw from the research study at any time. Whether you choose to participate in the study or not participate will not influence the type of care you receive or your relationships with your treatment providers or with the Cleveland Center for Bariatric Surgery (CCBS) at St Vincent Charity Hospital. This research is completely separate from your medical treatment and the information will not become part of your medical record.
If you agree to participate in this study, you will sign at the end of this form to indicate your agreement. When you sign, you are saying that you have been told about the research in which you voluntarily agree to participate; that your questions have been answered to your satisfaction; and that the information given to you has made you informed and enabled you to make a voluntary decision to participate in this study. When you sign this form you do not waive any legal rights, and the researchers are not relieved of any liability they may have. You will keep one copy of this consent form.

**For Concerns and Questions**
If you have health questions related to your bariatric surgery, please call the Cleveland Center for Bariatric Surgery at 216 529-2801 to speak with a medical staff person.

If you have any questions about or concerns about your rights as a research participant please call Ms. Charlotte Ilc or John B. Marshall, MD at the UHHS/CSAHS Cuyahoga Inc. Institutional Review Board (IRB) at 216 363-2674 (this is the IRB for St. Vincent Charity Hospital). You may also call Ms. Sharon McWhorter at 330 972-8311 to reach The University of Akron Institutional Review Board (IRB).

For questions about the study, please call the researcher, Jane Fink, at 330-321-9733 or email her at jfink@uakron.edu.

**Consent to Participate in the Study**

I agree to take part in this study. I have read this consent form, and the study has been explained to my satisfaction. I agree that the researcher can access my protected health information (PHI) in my medical record as stated in this consent as listed under the Confidentiality section.

Name of Participant

________________________

Signature of Participant

________________________

Date: ____________

Name of Person Obtaining the Consent

________________________

Signature of Person Obtaining Consent

________________________

Date: ____________

Name of Principal Investigator

________________________

Signature of Principal Investigator

________________________

Date: ____________
Hello,

My name is Jane Fink and I am calling you because you recently indicated you were willing in being contacted to learn about research conducted at The Cleveland Center for Bariatric Surgery (CCBS). We are looking for volunteers for a study that will be looking at beliefs and views that may influence adjustment following bariatric surgery. Would you like to hear more about participating in the study?

If no: Thank you for your time and consideration. Would you like to be contacted again to hear about future research?

If yes: Again, my name is Jane and I am a doctoral student at The University of Akron and I am working with the researchers at CCBS. Your involvement in this study if you decide to participate consists of completing four brief questionnaires that should take about 30 minutes to do. The questionnaires are aimed at exploring adjustment and quality of life following surgery. Information including questionnaires and a consent form will be mailed to you and include a return addressed postage paid envelope. You will be asked to return the completed questionnaires in the addressed postage paid envelope within two weeks of receiving the packet. The answers you provide will not become part of your medical record, and have no effect on your medical care at CCBS since the research is separate from your current medical care. Participation in the study is completely voluntary. You can refuse to answer any or all questions or withdraw from the research study at any time. We are requesting permission to look at your medical record to collect weight related information. Again any information collected for this study will not be made part of your medical record.
All information will be coded to keep your identity and information confidential. There will be no compensation to you for participating and no costs to you or your insurance.

Do you have any questions for me at this time? Would you like to participate in this study?

If no: Thank you for your time

If yes: Thanks, I will mail you a packet. Where would you like me to mail the packet?

When you receive the packet please look over the information and contact me if you have any questions at jfink@uakron.edu or by phone at 330 321-9733. We appreciate your participation.
Email Script

My name is Jane Fink and I am emailing you because you recently indicated you were willing in being contacted to learn about research conducted at The Cleveland Center for Bariatric Surgery (CCBS). We are looking for volunteers for a study that will be looking at beliefs and views that may influence adjustment following bariatric surgery. Would you like to hear more about participating in the study?

If no: Thank you for your time and consideration. Would you like to be contacted again to hear about future research?

If yes: Your involvement in this study if you decide to participate consists of completing four brief questionnaires which should take about 30 minutes to do. Participation in the study is completely voluntary. You can refuse to answer any or all questions or withdraw from the research study at any time. We are requesting permission to look at your medical record to collect weight related information. There will be no compensation to you for participating and no costs to you or your insurance. The answers you provide will not become part of your medical record, and have no effect on your medical care at CCBS since the research is separate from your current medical care. All information will be coded to keep your identity and information confidential. Information including questionnaires and a consent form will be mailed to you and include a return addressed postage paid envelope.

Would you like to participate and can I mail you a packet? Where would you like me to mail the packet? Thank you

Jane
APPENDIX F
DEMOGRAPHIC QUESTIONNAIRE

ID#___________     Date: ____/____/_____

Personal Demographics

1. What is your age? ____________  2. What is your gender? ____________

3. What is your race/ethnicity? ____________

4. What is your marital status? (circle one choice below)
   Never Married Widowed Married Divorced Other (specify) ____________

5. What is your highest educational background? (check one)
   _____ graduate/professional degree (MD, JD, PhD, MA)   _____ 4-yr college degree (BA, BS)
   _____ some college   _____ completed high school/GED
   _____ some high school   _____ grammar school

Bariatric Questions

6. Pre-surgery weight (pounds) ________  Pre-surgery BMI (if known) _________
7. Height ________  Current weight (pounds) ________  Current BMI (if known) ______
8. How many pounds did you expect to lose after surgery? ________
9. What % of your excess weight did you expect to lose after surgery? ________
10. Expected BMI after surgery (if known) ________  11. Date of Surgery __/__/_____
12. Type of bariatric surgery (circle one): Open Gastric Bypass Laparoscopic Gastric Bypass
    Laparoscopic Gastric Banding Other (specify) ________________________________
13. Pre-surgery employment status:
   employed full time____ part time______  not employed ________
14. Current employment status:
   employed full time____ part time______  not employed ________
13. Check which of the following statements best describes you? (circle the letter of the statement that best describes you)
   A. You are working toward achieving your reported weight loss goal but have not reached it yet
   B. You have reached your weight loss goal and are maintaining weight loss
   C. You are not working toward achieving your weight loss goal or are unable to maintain your weight loss goal

14. How successful do you feel having bariatric surgery has been for you? Circle the number below.

   1   2   3   4   5   6   7
   Not Successful  Somewhat Successful  Very Successful  Successful  Successful  Successful
APPENDIX G

WEIGHT EFFICACY LIFE-STYLE QUESTIONNAIRE

Listed below are a number of situations that lead some people to eat. We would like to know how confident you are that you would not eat in each situation.

Circle the number that best describes your feelings of confidence to not eat food in each situation according to the following scale:

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

1. I can resist eating when I am anxious (nervous).
   0 1 2 3 4 5 6 7 8 9

2. I can control my eating on weekends.
   0 1 2 3 4 5 6 7 8 9

3. I can resist eating even when I have to say “no” to others.
   0 1 2 3 4 5 6 7 8 9

4. I can resist eating when I feel physically run down.
   0 1 2 3 4 5 6 7 8 9

5. I can resist eating when I am watching TV.
   0 1 2 3 4 5 6 7 8 9

6. I can resist eating when I am depressed (or down).
   0 1 2 3 4 5 6 7 8 9

7. I can resist eating when there are many different kinds of food available.
   0 1 2 3 4 5 6 7 8 9

8. I can resist eating even when I feel it’s impolite to refuse a second helping.
   0 1 2 3 4 5 6 7 8 9

9. I can resist eating even when I have a headache.
   0 1 2 3 4 5 6 7 8 9

10. I can resist eating when I am reading.
    0 1 2 3 4 5 6 7 8 9
11. I can resist eating when I am angry (or irritable).
   0 1 2 3 4 5 6 7 8 9

12. I can resist eating when I am at a party.
   0 1 2 3 4 5 6 7 8 9

13. I can resist eating even when others are pressuring me to eat.
   0 1 2 3 4 5 6 7 8 9

14. I can resist eating when I am in pain.
   0 1 2 3 4 5 6 7 8 9

15. I can resist eating just before I go to bed.
   0 1 2 3 4 5 6 7 8 9

16. I can resist eating when I have experienced failure.
   0 1 2 3 4 5 6 7 8 9

17. I can resist eating when high-calorie foods are available.
   0 1 2 3 4 5 6 7 8 9

18. I can resist eating when I think others will be upset if I don’t eat.
   0 1 2 3 4 5 6 7 8 9

19. I can resist eating when I feel uncomfortable.
   0 1 2 3 4 5 6 7 8 9

20. I can resist eating when I am happy.
   0 1 2 3 4 5 6 7 8 9
APPENDIX H

DIETING BELIEFS SCALE (DBS)

Dieting Beliefs Scale (Stotland & Zuroff, 1990) – A measure of weight locus of control

Instructions:

Please respond to the following statements by indicating how well each statement describes your beliefs. Place a number from 1 (not at all descriptive of my beliefs) to 6 (very descriptive of my beliefs) in the box to the right of each statement.

<table>
<thead>
<tr>
<th>Not at all descriptive of my beliefs</th>
<th>Very descriptive of my beliefs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

1. By restricting what one eats, one can lose weight.
2. When people gain weight, it is because of something they have done or not done.
3.* A thin body is largely a result of genetics.
4.* No matter how much effort one puts into dieting, one’s weight tends to stay about the same
5.* One’s weight is, to a great extent, controlled by fate.
6.* There is so much fattening food around that losing weight is almost impossible.
7.* Most people can only diet successfully when other people push them to do it.
8. Having a slim and fit body has very little to do with luck.
9. People who are overweight lack the willpower necessary to control their weight.
10. Each of us directly is responsible for our weight.
11. Losing weight is simply a matter of wanting to do it and applying yourself.
12.* People who are more than a couple of pounds overweight need professional help to lose weight.
13. By increasing the amount one exercises, one can lose weight.
14.* Most people are at their present weight because that is the weight level that is natural for them
15. Unsuccessful dieting is due to lack of effort.
16.* In order to lose weight, people must get a lot of encouragement from others.

Note: * indicates items that are reverse scored.

References

APPENDIX I

IWQOL-LITE

Impact of Weight on Quality of Life-Lite Questionnaire

The Impact of Weight on Quality of Life-Lite Questionnaire (IWQOL-Lite) was not included in the appendices at the request of the authors due to copyright restrictions. If you would like information about the measure, contact Dr. Ronette L. Kolotkin Ph.D., Obesity and Quality of Life Consulting, 1004 Norwood Avenue, Durham, NC 27707, USA: (919)493-9995; Fax: (919) 493-9925; email address: rkolotkin@qualityoflifeconsulting.com
APPENDIX J

LETTERS OF APPROVAL

patrick6@zoominternet.net

----- Original Message -----  
From: J. Fink  
To: patrick6@zoominternet.net  
Sent: Sunday, June 17, 2007 12:50 PM  
Subject: Re: Research Design Comps paper Quantitative part

----- Original Message -----  
From: Curtis P Bradney  
To: J. Fink  
Cc: H. Gilbert Smith ; rkolutkin@yahoo.com  
Sent: Thursday, July 13, 2006 8:49 AM  
Subject: Re: Research Design Comps paper Quantitative part

Dear Jane,

Recognizing the nature of your study, we are pleased to allow you the use of the IWQOL-Lite for that purpose without charge. Please retain this email to serve as permission for use of the IWQOL-Lite in your “Dissertation Thesis/Proposal entitled The Relationship Between Weight Loss, Body Image, and Quality of Life in Post-Bariatric Surgery Patients” at St. Vincent Bariatric Center in Cleveland and/or Saint Elizabeth in Youngstown, for use with approximately 100-150 subjects. Please retain the Duke copyright notice on the copies of the instrument that you use. Of course, you should not distribute the instrument to anyone else, or use it for any other purposes.

We do not expect any financial compensation for this use of the instrument; however, we would appreciate your providing Dr. Kolotkin with demographic information (BMI, age, gender, race) on each subject in your study, and weight variables (baseline, gain, loss) with the raw data (IWQOL-Lite item scores) resulting from each use of the instrument by each subject. We do not want to receive any treatment information, or patient identifying information. This information is for use in the continued development and normalization of the instrument.

Should you wish to use the instrument in a funded study our standard license fees is $10 per subject for commercially-funded studies, $5 per subject for government and foundation funded studies, $3 per subject for internally funded, unfunded studies, and $3 per use for use in clinical practices.

I have attached scoring instructions and an English translation of the IWQOL-Lite for your use. All questions related to instrument application and scoring should be directed to Dr. Kolotkin, the developer of the instrument, who is copied on this email. Please let me know if you require any additional information.

With regards,

curt
Hi Jane,

I have made a note of the title change to our records and I appreciate your efforts to inform us. No other actions are required.
I do have one request, however, to maintain the confidential nature of the IWQOL. Since dissertations are published for library records, I would ask that you do not include the instrument in the published form of your dissertation. Thank you for understanding and good luck with your defense.

With regards,
Curtis

Hi Dr. Bradley,

You approved my use of the IWQOL-Lite for my dissertation (see below). I have my data collected and defend on 7/27/07. My Title changed since our first contact and I have included several other variables. The title is "The Role of the Social Cognitive Variables of Self-Efficacy, Locus of Control, Weight Loss and Quality of Life in Post-Bariatric Surgery Patients. I am not sure if the change in title and variables makes a difference. I was getting the approvals together for the dissertation and notices the change of title/variable. I do discuss body image but it is not a primary variable. I would be happy to send a copy of my abstract and will do so in an email to follow. I will send the requested demographic information to Dr. Ronnie Kolotkin as requested. I apologize for the lateness of this request but in honesty did not think of the title change until I went to put my information together for the appendices. I look forward to hearing from you and if there are any questions my phone number is 330-3243733. That is my work/dedicated cell I have with me all the time. As before the use of the IWQOL-Lite is for my dissertation and I am not receiving any funds to assist with the research. Thank you again for your help and for allowing the use of the instrument in my research. I did not know if I needed to contact you but thought I should do so due to the title change. Thank you again.

Jane Fink PhD Candidate
October 17, 2006

Ms. Jane Fink
796 Victoria Circle
Medina, OH 44256

Dear Ms. Fink:

You have my written permission to use the Weight Efficacy Lifestyle Questionnaire in your research. I appreciate your willingness to cite the scale in any future publications. I have enclosed a copy of the scale and a publication which may be of interest to you.

Sincerely,

Matthew M. Clark, Ph.D.
Professor of Psychology

MMC/srm
Enclosure
J. Fink wrote:

> Hi Dr. Toouli,
> I am a PhD candidate at the University of Akron, Akron Ohio. I am conducting research at St Vincent's Bariatric Center, Cleveland Ohio. I am attempting to see if there are different profiles that represent different adjustments to bariatric surgery. I am writing to see if I could include your five pictures procedures that were included in the Karmali and Shaffer article in CIM volume 28, no 4, August 2005 in my dissertation. I would be honored to be able to include the Figures 1-A through 2-B in my dissertation. I would also appreciate any Comments regarding my research topic. I have completed chapter 2 and will complete chapters 1 and three over the next month.
> I appreciate you taking the time to consider my requests and look forward to hearing from you. Thank you,
> Jane Fink BCD LISW ACSW CEDS
> PhD Candidate
> The University of Akron
> jfink@uakron.edu <mailto:jfink@uakron.edu> or
> patrick6@zoominternet.net <mailto:patrick6@zoominternet.net>
> Mobile 330 3219733

Happy for you to incorporate the figures in your thesis. Thank you for asking.
J Toouli.
December 22, 2006

Jane M. Fink, LISW, ACSW, CEDS,
The Center for Growth and Wellness
3632 W. Market Street, Suite 103
Fairlawn, Ohio 44333
Office: 330-321-9733
jfink@uakron.edu
or patrick6@zoominternet.net

On behalf of Stacy Brethauer, M.D., this letter serves as authorization of The Cleveland Clinic Foundation ("CCF"), which authorization includes that of Silas Chikunguwo, M.D., Ph.D., Philip Schauer, M.D., and illustrator Joseph Pangrace, BFA, CMI., full-time employee of CCF to Jane M. Fink, LISW, ACSW, CEDS, to publish the work further described in attachment A (Artwork) solely for the purposes set forth herein.

CCF grants to the Jane M. Fink, LISW, ACSW, CEDS, a royalty-free, non-exclusive license to use this Artwork on a ONE time "Print & Electronic" usage, in your University of Akron dissertation, working title: An Investigation of the Relationship of Weight Self-Efficacy, Locus of Control, and Quality of Life in Post Bariatric Surgery Patients'.

This work may not be recast, transformed or used as a derivative work in any form without written permission / license from CCF. All rights, title and interest in the Artwork shall remain the sole property of CCF, including but not limited to copyrights.

All uncompensated publications shall include the statement: "Reprinted with the permission of The Cleveland Clinic Foundation" and a complimentary issue of said publication supplied to: The Cleveland Clinic, Center for Medical Art & Photography - NA12.

Sincerely,

Jeffrey J. Loerch
Medical Illustration NA11
The Cleveland Clinic Foundation

CC: S. Chikunguwo
S. Brethauer
P. Schauer
J. Pangrace
A. Paladino
Research Confidentiality Agreement
The Cleveland Center for Bariatric Surgery at
St. Vincent Charity Hospital

In consideration of obtaining access to certain patients' records for the purpose of
inspection and/or copying same in connection with duly authorized research "The
Role of the Social Cognitive Variables of Self-efficacy, Locus of Control, Weight
Loss, and Quality of Life in Post-Bariatric Surgery Patients"

I, __________________________, hereby affirm that I am duly
authenticated "Responsible Investigator" within the definitions of that phrase as
approved by the UHHS/CSAHS Cuyahoga, Inc. Institutional Review Board as
related to research access to patient's charts and medical information and direct
contact with patients.

I hereby agree:

That I will confine all my inspections and/or copying from those patient's charts
furnished to me by the Cleveland Center for Bariatric Surgery (CCBS) at St.
Vincent Charity Hospital (SVCH) to the premises of the CCBS office.

That contact made with individuals identified by the medical records or patient
charts will confrom to procedures specified in the research protocol.

That I will not discuss, during the research or afterwards, any patient identity,
information, diagnosis or treatment that I observe or come into contact with during
my term of research at the Cleveland Center for Bariatric Surgery.

That I will at all times and in every way personally safeguard the patient
confidentiality of information in any patient's charts to which I am given access
pursuant to my execution of the document, and I will ensure confidentiality of
information received from patients via telephone conversations, email messages,
questionnaires, and other forms of communication used in the research.

____________________________
Signature of Responsible Investigator

3  18  07
Month / Day / Year

Rev. 3/06
March 7, 2007

Jane Fink, BCD, LISW, ACSW, CEDS, PhD Candidate
796 Victoria Circle
Medina, Ohio 44256

Dear Ms. Fink,

This letter serves as notification that the Cleveland Center for Bariatric Surgery (CCBS) at St. Vincent Charity Hospital has agreed to participate as the research site for your proposed doctoral research "The Role of the Social Cognitive Variables of Self-efficacy, Locus of Control, Weight Loss, and Quality of Life in Post-Bariatric Surgery Patients".

Before research can begin, you will need to obtain approval from the UHHS/CSAHS Cuyahoga, Inc. Institutional Review Board (IRB) and provide a copy of the approval letter for our records.

In addition, you will need to sign the enclosed CCBS Confidentiality Agreement before accessing medical records or contacting patients. Please forward a copy of your IRB approval and the signed confidentiality form in the enclosed postage-paid envelope.

We are pleased to serve as your research site and look forward to working with you.

Best regards,

Karen Schulz, RN, MSN
CCBS Executive Program Director

dmm/enc
APPENDIX K

INSTITUTIONAL REVIEW BOARD APPROVALS

April 4, 2007

Jane Marie Fink
790 Victoria Circle
Medina, Ohio 44256

Ms. Fink:

The University of Akron’s Institutional Review Board for the Protection of Human Subjects (IRB) completed a review of the protocol entitled “The Role of Self-Efficacy Levels of Control and Quality of Life on Post Bariatric Surgery Outcomes”. The IRB application number assigned to this project is 20070114.

The protocol qualified for Exempted Review and was approved on April 4, 2007. The protocol represents minimal risk to subjects and matches the following federal category for expedited review:

(7) Research on individual or group characteristics or behavior or research employing survey, interview, and history, focus group, program evaluation, human factors evaluation or quality assurance methodologies

This approval is valid until April 4, 2008 or until modifications are proposed to the project protocol, whichever may occur first. In either instance, an Application for Continuing Review must be completed and submitted to the IRB.

Enclosed are the informed consent documents, which the IRB has approved for your use in this research. Copies of these forms are to be submitted with any application for continuation of this project.

Please note that, within one month of the expiration date of this approval, the IRB will forward an annual review reminder notice to you by email, as a courtesy. Nonetheless, it is your responsibility as principal investigator to remember the renewal date of your protocol’s review. Please submit your continuation application at least two weeks prior to the renewal date, to ensure the IRB has sufficient time to complete the review.

Please retain this letter for your files. If the research is being conducted for a master’s thesis or doctoral dissertation, you must file a copy of this letter with the thesis or dissertation.

Sincerely,

Sharon McWhorter
Interim Director

Cc: Linda Perez, Advisor
Rodale Hall, IRB Chair
April 4, 2007

Jane M. Fink
796 Victoria Circle
Medina OH 44266

Re: Protocol: The Role of the Social Cognitive Variables of Self-Efficacy, Locus of Control and Quality of Life in Post-Bariatric Surgery Patients – IRB #311

Dear Ms. Fink:

The above named protocol and informed consent you submitted for review to the UHHS/CSAHS-Cuyahoga, Inc. Institutional Review Board has been approved for one year. Enclosed is the formal approval for your records.

An active protocol or research project must be reviewed periodically by the I.R.B. Your project will need to be reviewed in one year. Please be aware that approval of this study ends on March 23, 2008. We ask that you keep this in mind as you are continuing your project.

If, during the conduct of the project, any unanticipated problems involving risks to subjects or others are encountered, they must be promptly reported to the I.R.B. on an Adverse Event Report form. Any changes in the approved research during the period for which I.R.B. approval has already been given must be reported to the I.R.B. and may not be initiated without I.R.B. review and approval. The form, Investigator’s Checklist for Addendum to Approved Protocol, should be submitted when reporting protocol changes. If the study is completed or terminated prior to the expiration date, you must notify the IRB.

The I.R.B. will terminate any protocol that has not completed the requirements of the Board, and no activity may be carried out under a protocol that does not have current approval, including submission of required Continuing Review report.

If you have any questions, please do not hesitate to contact me at 216-363-2674. Thank you for your cooperation.

Sincerely,

Charlotte H. Ilc
CME/Research Coordinator

2351 East 22nd Street • Cleveland, OH 44115 • 216.363.2674 • 216.363.3334 (FAX)
INSTITUTIONAL REVIEW BOARD

INVESTIGATOR: Jane M. Fink
796 Victoria Circle
Medina OH 44266

PROTOCOL: The Role of the Social Cognitive Variables of Self-Efficacy, Locus of Control and Quality of Life in Post Bariatric Surgery Patients

IRB #311

DATE: April 4, 2007

NOTIFICATION OF IRB ACTION

<table>
<thead>
<tr>
<th>DOCUMENT</th>
<th>VERSION</th>
<th>IRB ACTION</th>
<th>IRB MEETING DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Dated 3/7/07</td>
<td>Approved</td>
<td>4/3/07</td>
</tr>
<tr>
<td>Introduction Letter</td>
<td>Approved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone/E-mail Script</td>
<td>Dated 4/2/07</td>
<td>Approved</td>
<td>4/3/07</td>
</tr>
<tr>
<td>Consent Form</td>
<td>Dated 4/2/07</td>
<td>Approved</td>
<td>4/3/07</td>
</tr>
<tr>
<td>Questionnaires</td>
<td>Approved</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments: This study is approved for one year.

Next Review Date: March 23, 2008

If you have any questions, please contact the IRB Office at 216-363-2674.

John Marshall, M.D.
Chairman, Institutional Review Board
APPENDIX L

PARTICIPANT FOLLOW-UP LETTER

Participant Number___________

Thank you so much for participating in the study, “The Role of Self-Efficacy, Locus of Control, Weight Loss and Quality of Life in Post Bariatric Surgery Patients.” Your responses contributed toward a better understanding of the impact of surgery and your needs.

The study included 92 patients, of which 79 (85.87%) were female, and 13 (14.13%) were male. The majority of the patients (91.5%) were Caucasian, with only 8.5% African American. Participants at different periods postsurgery (13 months to 8 years) were evaluated using self-report questionnaires measuring self-efficacy, locus of control, and quality of life. Self-efficacy is the belief that one can accomplish specific tasks necessary to reach a goal. Locus of control refers to the extent of control individuals believe they have over the outcomes in their lives.

The results indicated that the percentage of excess weight loss predicted quality of life. Additionally, self-efficacy and locus of control significantly differentiated between successful and unsuccessful bariatric surgery group outcomes. These findings support the need to focus on self-efficacy and locus of control beliefs with patients to improve outcomes following bariatric surgery.
This information may be beneficial to bariatric surgery patients, mental health counselors, or other professionals working with the bariatric population. In addition, the findings provide groundwork for the development of specific interventions to improve outcomes and adjustment following bariatric surgery.