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Philadelphia College of Osteopathic Medicine

Department of Psychology

THE RELATIONSHIP BETWEEN COGNITIVE DISTORTIONS AND
PSYCHOLOGICAL AND BEHAVIORAL FACTORS IN A SAMPLE OF
INDIVIDUALS WHO ARE AVERAGE WEIGHT, OVERWEIGHT, AND OBESE

By Christina Berchok Shook

Submitted in Partial Fulfillment of the Requirements of the Degree of

Doctor of Psychology

August 2010

**PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE
DEPARTMENT OF PSYCHOLOGY**

Dissertation Approval

This is to certify that the thesis presented to us by Christina Berchock Shook on the 8th day of June, 2010, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.

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Acknowledgements

I owe my deepest gratitude to my mentor and chairperson, Dr. Robert DiTomasso, who provided encouragement, guidance, and support from the initial level to the final level of this project. He generously provided his time, knowledge, experience, and leadership throughout the dissertation process, and he inspired me to gain a deeper understanding of cognitive behavioral therapy and primary care medicine. He is a remarkable clinician, researcher, mentor, and teacher.

Equal gratitude is also extended to Dr. Donald Masey, who taught me countless things about clinical health psychology that I use in clinical practice and research endeavors. He is a knowledgeable clinician, dedicated teacher, and empathic mentor.

I would also like to thank Dr. Harry Morris, who made his support available to me in a number of ways. His guidance throughout this project and clinically in the health care centers of PCOM has deepened my desire to help individuals manage not only their psychological well-being, but also their physical well-being.

A special thanks is given to the Central Penn Health and Fitness Center and the primary care clinics of PCOM for opening their doors to me and allowing me to collect data.

I would like to extend a final thank you to my husband, Bryan Shook, and my parents, Michael and Sara Berchock, who have provided endless support and encouragement throughout my academic endeavors. Without them I would not be where I am today. Everyone should know what it feels like to have a family that fully supports your dreams.

Abstract

The current study was designed to investigate the relationship between the frequency of cognitive distortions, as measured by the Inventory of Cognitive Distortions (ICD), and psychological and behavioral factors, as measured by the Millon Behavioral Medicine Diagnostic (MBMD), which includes negative health habits, psychiatric indications, and treatment prognostics among a sample of individuals who were average weight, who were overweight, and who were obese. The sample of 385 men and women was recruited primarily from a health and fitness center. The results of this study indicated that negative health risk behaviors such as inactivity and overeating, as well as depression were associated with increased obesity rates. The findings of this study did not suggest that individuals who are obese engage in higher levels of distorted thinking. Instead, the results confirmed previous research indicating that there was a relationship between the frequency of cognitive distortions and psychological and behavioral factors, such as negative health habits, psychiatric indications, and treatment prognostics. It is possible that distorted thinking impacts individuals' abilities to manage psychological problems and behavioral problems, which, in turn, impact the course of medical conditions such as obesity. Gaining further evidence that there is a strong relationship between cognitive distortions and psychological and behavioral factors that impact medical conditions and influence the course of treatment lends support for the utilization of cognitive behavioral treatments in medical settings. Utilization of tailored cognitive behavioral interventions in medical settings may produce more successful management of mental and physical health conditions, resulting in more positive treatment outcomes, decreased rates of morbidity and mortality, and reduced health care costs.

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THE RELATIONSHIP BETWEEN COGNITIVE DISTORTIONS AND
PSYCHOLOGICAL AND BEHAVIORAL FACTORS IN A SAMPLE OF
INDIVIDUALS WHO ARE AVERAGE WEIGHT, OVERWEIGHT, AND OBESE

Chapter 1: Introduction

Statement of the Problem

Obesity is a major public health concern in the United States. The prevalence of obesity continues to increase at an alarming rate among children, adolescents, and adults (Fabricatore & Wadden, 2006; Flegal, Carroll, Ogden, & Johnson, 2002; Hedley, Ogden, Johnson, Carroll, Curtin, & Flegal, 2004; Ogden, Carroll, McDowell, & Flegal, 2007). Obesity, particularly severe or morbid obesity, is a multifaceted disease that is associated with increased morbidity (e.g., diabetes, cardiovascular disease, sleep apnea, osteoarthritis) and mortality. Although behavioral and pharmacological treatments have been developed and have been shown to result in a clinically significant weight loss of about 10% of initial weight (Cooper, Fairburn, & Hawker, 2003; Wing, 2002), mean weight losses achieved with nonsurgical approaches have remained virtually unchanged over the past 20 years (Fabricatore & Wadden). Researchers suggest this is due to statistics indicating that most weight lost through behavioral interventions is reliably regained within 5 years (Perri & Corsica, 2002; Jeffery et al., 2000; Wilson & Brownell, 2002; Wadden & Butryn, 2003). With the prevalence of obesity continuing to increase, it is evident that clinical weight loss interventions are not providing a solution to the growing obesity crisis (Fabricatore & Wadden).

Purpose of the Study

This study sought to investigate how behavioral, psychosocial, and cognitive variables may differ among individuals who are obese, are overweight, and are of average weight. More specifically, it sought to understand what it is that contributes to individuals' maintaining behavioral patterns and negative health behaviors that are counterproductive to weight loss and that contribute to weight regain. Thus, the purpose of this study was twofold: 1) to investigate the relationship between psychological and behavioral factors, as measured by the Millon Behavioral Medicine Diagnostic (MBMD; Millon, Antoni, Millon, Meager, & Grossman, 2001), which includes measures of negative health habits, psychiatric indications, coping styles, stress moderators, treatment prognostics, and management guides among a sample of individuals who are obese, overweight, and of average weight, and 2) to investigate further the relationship between the frequency of cognitive distortions, as measured by the Inventory of Cognitive Distortions (ICD; Yurica & DiTomasso, 2001), and psychological and behavioral factors, as measured by the MBMD (Millon et al.), among a sample of individuals who are obese, overweight, and average weight.

Relevance to Cognitive Behavioral Therapy

Cognitive theory and research indicate that cognitive distortions contribute to psychological and behavioral disorders (Beck, Rush, Shaw, & Emery, 1979; Beck, Freeman, & Davis, 1993; Millon & Davis, 1996). The complex interplay of psychological, cognitive, and behavioral factors that contribute to the development and maintenance of obesity makes it a very difficult disease to manage and treat. Moreover, one of the greatest challenges in the long-term management of obesity is the maintenance

of weight loss. For many individuals who are overweight or obese, and who achieve weight loss using behavioral or pharmacological treatments, one of the most difficult issues is preventing subsequent weight regain when treatment is discontinued.

Investigating the relationship between cognitive distortions and psychological and behavioral factors may help to understand the psychological underpinnings of what it is that contributes to individuals' maintaining behavioral patterns and negative health behaviors that are counterproductive to weight loss and that contribute to weight regain. More specifically, maladaptive patterns of thinking are associated with negative health behaviors that are known to contribute to obesity (Uhl, 2007). These maladaptive patterns of thinking may be contributing to the ongoing difficulty that many individuals have not only in losing weight, but also in maintaining weight loss. Thus, the identification of distorted cognitions associated with negative health behaviors that contribute to the maintenance of obesity may offer primary care providers and mental health clinicians an increased understanding of how distorted cognitions are impacting the health of the individuals they treat.

Providing physicians and mental health clinicians with information about the relationship between distorted cognitions and health behaviors that impact weight management may encourage physicians to make referrals to mental health clinicians and assist in the process of managing health behaviors and weight. In addition, mental health clinicians can tailor cognitive behavioral treatments to individuals to produce more successful weight loss and prevention of weight regain. Mental health clinicians can also provide psychoeducational information to individuals struggling with weight loss and weight regain in order to increase the understanding of the interplay of cognitive

distortions and behavioral factors. In addition, by utilizing a cognitive behavioral intervention tailored for the treatment of obesity, clinicians are able not only to help individuals who are obese develop the skills needed to lose weight, but also to help them alter the cognitions that underlie barriers to weight loss and to behaviors known to contribute to weight regain. Ultimately, this will result in more positive treatment outcomes, improvements in weight-related comorbidities, reduced health care costs, and decreased rates of mortality.

Chapter 2: Literature Review

Definitions and Prevalence of Obesity

Obesity is a worldwide major public health concern. The World Health Organization (WHO) estimated that 1.6 billion adults worldwide are overweight, and 400 million adults are obese (World Health Organization, 2005). In the United States, obesity affects over 72 million adults (Ogden et al., 2007). According to the National Institutes of Health (NIH; U.S. Department of Health and Human Services [USDHHS], 1998), overweight refers to weighing more than a standard level for a certain height and weight, but obesity is considered a chronic disease of excessive body fat. The most commonly used measure of obesity is body mass index (BMI), which categorizes weight as it relates to height. BMI is calculated as weight in kilograms divided by the square of height in meters. According to the NIH, individuals with a BMI of 18.5 to 24.9 kg/m² are defined as average weight, a BMI of 25 to 29.9 kg/m² is defined as overweight and a BMI greater than or equal to 30 kg/m² is categorized as obese (USDHHS). In addition, researchers characterize severe or morbid obesity as a BMI of greater than or equal to 40 kg/m² or a BMI of 35 kg/m² with comorbidities (Fobi, 2004).

Obesity is of particular concern in the United States because its prevalence continues to increase among children, adolescents, and adults (Flegal et al., 2002; Hedley et al., 2004; Ogden et al., 2007). More than 50% of U.S. adults over 20 years of age exceed healthy weight ranges (i.e., BMI greater than 25 kg/m²); 59.3% of these adults are men and 49.6% are women (Field, Barnoya, & Colditz, 2002). Using results from the Centers for Disease Control's [CDC] 2003-2004 National Health and Nutrition Examination Survey [NHANES], the CDC estimated that in 2004, 17.1% of United

States children and adolescents were overweight, and 32.2% of adults were obese (i.e., BMI greater than or equal to 30 kg/m²). In terms of ethnic differences, the prevalence of obesity is higher among African Americans and Hispanics; approximately 67% of adult African American and Hispanic women are considered overweight or obese, compared with 46% of adult non-Hispanic white women (Field et al.). Thus obesity affects most cultural groups and is now considered to be a worldwide epidemic that must be addressed more effectively.

Not only is obesity among the most prevalent of diseases, but it is also associated with substantial societal and personal costs. For example, obesity is related to a wide variety of negative health outcomes including co-morbidity with other physical health concerns, mortality, and disability, which result in considerable economic costs to society (Wadden, Brownell, & Foster, 2002). In 1995, obesity-related complications were estimated to cost our nation 70 billion dollars (Field et al., 2002). Thus, not only does obesity have consequences for the individual, but also for the larger society.

In recent years there has been a growing interest in research which examines the psychosocial aspects of obesity (for reviews see Fabricatore & Wadden, 2004; Friedman & Brownell, 1995). In the past, researchers believed that excess weight was the manifestation of underlying psychopathology (Fabricatore & Wadden). It has been argued that the assumption that all individuals who are obese suffer from greater levels of psychopathology, is the result of methodological problems with previous research (Istvan, Zavela, & Weidner, 1992). With many methodological problems addressed, research on psychological correlates of obesity has now entered what Friedman and Brownell (p. 4) describe as a “second generation”, in which researchers are attempting to

identify risk factors for psychopathology within the obese population. In the second generation of obesity research, studies suggested that certain groups such as women, individuals who are extremely obese, and individuals who are obese and have binge eating disorder are at greater risk for psychopathology (Fabricatore & Wadden). Over the past several years, research has started to move into a third generation, in which studies are designed to uncover temporal and causal relations between body weight and psychological distress (Friedman & Brownell).

The current study is designed as a means of continuing into the third generation of research and understanding more fully the behavioral and psychosocial presentation of individuals who are obese. Specifically, the study is designed to examine the associations between cognitive distortions, psychological variables, and behavioral factors that may shape the way individuals manage health problems that contribute to the maintenance of obesity. A review of the literature is presented to further the readers' understanding of the relationship between obesity, cognitive distortions, and biopsychosocial factors. First, research is presented on biological and psychosocial factors related to obesity. Second, the cognitive model is reviewed. Third, cognitive factors that influence health-related behaviors are reviewed as they pertain to obesity. Fourth, the cognitive model is presented. Last, cognitive-behavioral treatment of obesity is reviewed as it relates to helping individuals develop the behavioral skills needed to address barriers to weight loss and alter distorted cognitions that underlie barriers to weight loss and also to behaviors known to contribute to weight regain.

Biopsychosocial Factors Related to Obesity

Biological Factors

Obesity, particularly severe or morbid obesity, is a multifactorial disease that develops from a complex interaction of biological (genetic, physiological, metabolic, neuroendocrine) and psychosocial (environmental, social, behavioral, cognitive, cultural) variables. Moreover, obesity results in considerable biological and psychosocial consequences. For example, studies have linked obesity to increased risk of Type II diabetes mellitus (Li, Bowerman, & Heber, 2005; Pi-Sunyer, 1993), hypertension (Li et al.), cardiovascular disease (Pi-Sunyer; Rexrode et al., 1997), dyslipidemia (Li et al.), gall bladder disease (Wadden, Brownell, et al., 2002), sleep apnea (Li et al.; Wadden, Brownell, et al.), osteoarthritis (Li et al.; Wadden, Brownell, et al.), asthma (USDHHS, 1998), and certain types of cancer (Bergstrom, Pisani, Tenet, Wolk, & Adomi, 2001; Calle, Rodriguez, Walker-Thurmond, & Thun, 2003).

In addition to the increased risk of health complications, obesity is also associated with increased risk for mortality. Researchers have consistently shown that adults with a BMI over 30 kg/m² are at a greater risk of death (Baik, Ascherio, & Rimm, 2000; Manson et al., 1995). Obesity is also considered to be the second leading cause of preventable premature death in the United States (Stein & Colditz, 2004). For example, Peeters et al. (2003) concluded that overweight women and men lived 3.3 and 3.1 fewer years, respectively, than their average-weight counterparts, after controlling for the effects of smoking. Additionally, studies show that life expectancy is shortened by approximately 5.8 years for women and 7.1 years for men (Flegal, Graubard, Williamson,

& Gail, 2005; Peeters et al.). Overall, excessive weight is clearly associated with an increased risk of death.

Psychosocial Factors

In addition to the physical health problems related to obesity, there are numerous psychological and psychosocial consequences. The social impact of obesity is far-reaching for individuals because psychological and psychosocial factors ultimately influence health and general well-being (Fine et al., 1999; Stein & Colditz, 2004). For example, overweight and obesity are associated with social discrimination, depression, disordered eating, and poor quality of life (Fabricatore & Wadden, 2006). More recent research suggests that the risk of such problems is greater among certain subgroups of individuals who are overweight and obese, such as women, patients seeking bariatric surgery, and the extremely obese (Bean, Stewart, & Olbrisch, 2008). Because mental health professionals are more likely to see these subgroups of the obese population, it is important to have an understanding of the emotional and psychological complexities that impact treatment approaches and the maintenance of successful weight loss. Thus, psychosocial variables are presented and examined in terms of those which occur more frequently among certain subgroups.

Discrimination. One of the most prevalent psychosocial consequences of obesity is discrimination. Despite the increasing occurrence of being overweight and being obese, stigma, prejudice, and discrimination against persons with obesity are common consequences in our society (Bean et al., 2008; Fabricatore & Wadden, 2003). Research indicates that individuals who are overweight and obese are characterized as “mean, stupid, ugly, unhappy, less competent, socially isolated, and lacking in self-discipline,

motivation, and personal control” (Puhl & Brownell, 2006, p. 1802). Other studies show that as early as age five, children rate other children who are overweight and obese as less likeable (Penny, 2007). In addition to various forms of indirect discrimination, individuals who are overweight and obese frequently face direct discrimination in the form of negative comments, social exclusion, being stared at, and subjection to physical barriers and obstacles (Bean et al.).

Bias and discrimination against individuals who are overweight and obese appear to persist into adulthood and ultimately affect relationships, employment, physical health, personal well-being, and psychological health. For example, research suggests that weight gain is associated with poorer well-being, especially among women (Rumpel, Ingram, Harris, & Madans, 1994). In addition, Gortmaker, Must, Perrin, Sobol, and Dietz (1993) followed over 10,000 adolescents, some of whom were overweight and some of whom were normal weight for 7 years and found that females who were overweight had completed significantly fewer months of school, were less likely to be married, and had lower household incomes than females who were nonoverweight despite comparable intellectual aptitudes. Males who were overweight were less likely to be married than their peers who were nonoverweight. In contrast, peers with chronic conditions such as asthma, rheumatoid arthritis, and cerebral palsy did not differ from their peers on any of the outcomes. Thus it appears that in our society there continues to be bias against individuals with a chronic condition such as obesity; however, it is considered unacceptable to hold biases against individuals with other chronic conditions.

The pressure to be thin is promulgated throughout the media and is endorsed by social and cultural norms. Some researchers argue that given our society’s obsession with

thinness, it is not surprising that people who are obese are stigmatized for excess weight (Schwartz & Brownell, 2002). The compilation of media pressure, social pressure, discrimination, and stigmatization places significant stress on people to obtain the thin ideal body. Puhl and Brownell (2006) argued that the stress and societal emphasis on thinness may result in body dissatisfaction, stress, anxiety, and most commonly, emotional eating. Emotional eating is described as a common coping response to stigmatization, and plays a pivotal role in the development and maintenance of obesity (Puhl & Brownell). Given the evidence of discrimination against persons who are overweight and obese, the potential for elevated levels of stress, body dissatisfaction, and emotional eating, and the contribution of these factors to the development and maintenance of obesity, it seems clear that these are areas in need of attention when providing treatment for obesity. Moreover, addressing these factors may help individuals who are obese develop healthy behaviors that produce weight loss, and encourage the maintenance of treatment effects over time so as to discourage weight regain.

Psychological well-being. In addition to discrimination, certain groups of individuals who are overweight and obese may experience consequences that also affect their psychological well-being. In recent years, research has increasingly emphasized the importance of considering the psychosocial aspects and consequences of obesity (for reviews see Fabricatore & Wadden, 2004; Friedman & Brownell, 1995). In the past, researchers believed that all individuals who are obese suffered from greater levels of psychopathology; however, it was argued that this finding was the result of methodological problems with previous research (Istvan et al., 1992). Nevertheless, early studies that found few differences in psychological functioning between individuals who

are obese and nonobese in the general population (Stunkard & Wadden, 1992; Wadden & Stunkard, 1985), also suffered from methodological shortcomings such as small sample size, lack of nationally representative surveys, variable criteria to define overweight and obesity, lack of control groups, the use of self-report measures only, and inadequate examination of gender differences (for reviews see Friedman & Brownell; Wadden et al., 2001). Thus, over the last 10 years researchers have attempted to examine more accurately, the psychological impact of obesity.

In more recent years, the psychological consequences of obesity have been studied, based on nationally representative samples. According to these studies, populations who are obese differ minimally in terms of psychological status, with a substantial minority of individuals who are overweight and obese having significant emotional complications (Carpenter, Hasin, Allison, & Faith, 2000; Fabricatore & Wadden, 2006). Although, overall, there appear to be minimal differences between groups, researchers have identified subgroups of individuals who are overweight and obese who are at greatest risk of experiencing emotional complications. These groups include women, individuals who are extremely obese, and individuals with binge-eating disorder (Bean et al., 2008; Wadden et al., 2001).

In terms of women, many earlier studies failed to examine gender differences, and subsequently the psychological impact of obesity was assumed to be minimal. Several studies that addressed gender differences revealed that women who were obese appeared to experience different psychosocial consequences than men who were obese (Carpenter et al., 2000; Istvan et al., 1992; Onyike, Crum, Lee, Lyketsos, & Eaton, 2003). First, Istvan et al. found a positive relationship between BMI and symptoms of depression

among women who smoked. No relationship was found among women who never smoked. In contrast to women, no relationship between BMI and depression was observed in men, regardless of smoking status. Second, Carpenter et al. used a structured interview with a nationally representative sample of over 40,000 people and found that women who were obese were 37% more likely to have experienced major depression in the previous year than women who were of average weight. In addition, women who were obese were significantly more likely to report suicidal ideation and suicide attempts. In contrast, men who were obese had significantly reduced risks of major depression and suicide attempts. Interestingly, being underweight, rather than being obese, was associated with an increased risk of all three adverse events in men. Similar to the two epidemiological studies cited above, Onyike et al. found that obesity was significantly related to depression for women who are obese, but not for men who are obese. It is not surprising that the relationship between obesity and depression is moderated by gender, given the finding that the prevalence of depression is higher among women than among men in the general population (American Psychiatric Association, 2000). Some researchers suggest that women may be at higher risk than men of emotional complications because of the greater social pressures on females to be thin and also the greater weight related stigma (Carpenter et al., 2000; Puhl & Brownell, 2006). Although these factors may not fully account for the differential relationship between obesity and depression among men and women, they are likely to contribute to it.

In addition to women, studies identify individuals who are extremely obese as a group that is at greater risk of experiencing emotional complications (Berkowitz & Fabricatore, 2005; Onyike et al., 2003; Wadden et al., 2001). First, Wadden et al.

examined symptoms of depression, as measured by the Beck Depression Inventory (BDI; Beck, Steer, & Brown, 1996), among a group of women who were extremely obese (BMI ≥ 40 kg/m²) and who were seeking bariatric surgery and a group of women (BMI ≥ 40 kg/m²) who were seeking weight reduction by pharmacotherapy. Results indicated that the women who were extremely obese and who were seeking bariatric surgery (BMI ≥ 40 kg/m²) reported significantly greater symptoms of depression, as well as lower self-esteem, than the group of women (BMI ≤ 40 kg/m²) who were seeking pharmacotherapy. Second, Onyike et al. found individuals with a BMI ≥ 40 kg/m² to be five times more likely to meet criteria for major depression, compared with persons of average weight. Last, Berkowitz and Fabricatore found that persons who were extremely obese and sought weight-loss surgery had lower self-esteem and higher rates of depression than individuals who were less obese and sought behavioral and pharmacological weight loss interventions. Further studies of this issue are needed; however, it appears that as BMI increases beyond 40 kg/m², individuals are increasingly likely to experience health and psychological complications such as depression.

Individuals with binge eating disorder are also considered to be a group at high risk for experiencing psychological complications. According to the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, text revision (DSM-IV-TR; American Psychiatric Association [APA], 2000) binge eating is characterized by the consumption of an amount of food that is definitely larger than most individuals would eat under similar circumstances in a discrete period of time, with a subjective sense of loss of control. Previous research has found that binge eating is related to increased rates of depression among individuals who are obese and are seeking weight reduction

(Stunkard, 2002; Telch & Agras, 1994; Wadden, Foster, Letizia, & Wilk, 1993). For example, Telch and Agras found that individuals with severe binge eating reported significantly greater symptoms of depression than did individuals who were obese with moderate or no binge eating. Similarly, other studies found that individuals who were obese and diagnosed with binge eating disorder have higher rates of depression than individuals who were not obese without a diagnosis of binge eating disorder (Kuehnel & Wadden, 1994; Mussell, Peterson et al., 1996). Several studies have also found that even subthreshold binge eating disorder is associated with significant psychopathology and distress (Goldschmidt et al., 2008). In contrast, Brody, Walsh, and Devlin (1994) found no differences in reported symptoms of depression among individuals who were obese with binge eating disorders and those without binge eating disorder. Although there is some inconsistency in the research findings, it appears that the majority of the research indicates that, in comparison with individuals who were obese without binge eating behaviors, those individuals who were obese with binge eating behaviors are more likely to report increased symptoms of depression.

In addition to increased rates of depression among individuals who are obese with binge eating behaviors, research has also found a significantly greater lifetime prevalence of other Axis 1 disorders, as well as substance abuse and dependence (Eldredge & Agras, 1996; Mussell, Mitchell, et al., 1996; Mussell, Peterson, et al., 1996; Specker, de Zwann, Raymond, & Mitchell, 1994; Tanofsky, Wilfley, Spurrell, Welch, & Brownell, 1997; Telch & Agras, 1994; Williamson & Martin, 1999). In sum, the research findings concerning binge eating disorder emphasize the need to distinguish between individuals who are obese with an eating disorder and those without an eating disorder. At present,

the relationship among obesity, binge eating, and depression are not well understood (Wadden, Womble, Stunkard, & Anderson, 2002). Nevertheless, given the evidence that certain subgroups of obese persons are at elevated risk for psychological distress, it seems clear that this is an area in need of attention when providing treatment for obesity.

Moreover, assessment should be provided to understand further the contribution of these factors to the development and maintenance of obesity. Addressing these factors it may help individuals who are obese develop healthy behaviors that produce weight loss, and encourage the successful maintenance of treatment effects over time.

Quality of life. In conjunction with psychological distress, obesity also has adverse psychosocial effects on quality of life. Health-related quality of life refers to the burden of suffering and limitations in work and social functioning associated with illness (Wadden, Womble, et al., 2002). Studies show that individuals who are obese report greater impairments in social and occupational roles, increased complaints of pain, reduced vitality, increased physical comorbidities, poorer physical health, and increased self-consciousness in public (for a review see Wadden et al., 2001). Overall, a large proportion of obese individuals experience undesired physical or social consequences of their weight that diminish quality of life. The emotional consequences typically do not require professional intervention, but are likely to detract from the individuals' enjoyment of work and leisure activities (Wadden, Womble, et al.). Moreover, the diminished opportunities to engage in physical activity and the social consequences of weight contribute to the difficulty which some individuals have in losing weight and preventing weight regain.

Based on the research presented, it is evident that individuals who are obese are frequently confronted with discrimination and experience diminished quality of life. In addition, research also indicates that certain groups of individuals who are obese are at greater risk for psychological distress. It is also evident that obesity places individuals at increased risk for physical health complications. It is believed that the presence and combined impact of biopsychosocial stressors can impair the ability to make necessary behavioral and dietary changes required to achieve weight loss and prevent weight regain. What research has not yet shown is how cognitive factors contribute to the development and maintenance of obesity.

Cognitive Factors

Cognitive theory and research indicate that cognitive distortions contribute to psychological and behavioral disorders (Beck et al., 1979; Beck et al., 1993; Millon & Davis, 1996). Nevertheless, the complex interplay of psychological and behavioral factors that contribute to the development and maintenance of obesity is not clearly understood. Furthermore, one of the biggest challenges in the long-term management of obesity is the maintenance of weight loss. For many individuals who are overweight and obese achieve weight loss using both behavioral and pharmacological treatments; however the most difficult part is preventing subsequent weight regain when treatment is discontinued. Investigating the relationship between cognitive distortions and psychological and behavioral factors may help to understand what contributes to individuals maintaining behavioral patterns that contribute to weight regain. A review of the cognitive model and Cognitive Behavioral Therapy (CBT) for obesity is presented to further the readers understanding of the relationship between obesity, cognitive

distortions, and factors that impact the maintenance of behavioral patterns and negative health behaviors that are counterproductive to weight loss and contribute to weight regain.

The Cognitive Model and Obesity

A review of the literature revealed no research addressing the frequency of cognitive distortions among a sample of individuals who are overweight and obese. Moreover, no studies were found assessing the relative contribution of the frequency of cognitive distortions to behavioral and psychological factors that influence the course of treatment for individuals who are overweight and obese. Among the many benefits of gaining a more comprehensive understanding of how cognitive distortions relate to psychological and behavioral factors, acquiring an understanding of the psychological underpinnings of what may contribute to the obesity epidemic would be useful to medical doctors and psychologists. In some cases, underlying cognitive distortions may contribute to the difficulty which individuals who are obese have in losing weight and preventing weight regain. In these cases, treatment of cognitive distortions should be highly successful with interventions such as CBT. If left untreated, however, cognitive distortions may contribute to ongoing difficulty with maintaining behavioral plans, with compliance with treatment recommendations, and with overall success with weight loss. In turn, this results in increased utilization of medical services and higher health care costs, due to increased frequency of doctors visits and continued treatment of obesity-related comorbid conditions. In order to provide a more comprehensive understanding of cognitive distortions and the use of CBT, the defining features of the cognitive model and CBT are presented.

Overview of the Cognitive Model

CBT is founded on three basic propositions (Dobson & Dozois, 2002). First, cognitions influence behavior. Second, cognitive processes are amenable to observation and change. Third, desired behavior change can be achieved by altering cognitions. One of the foremost theorists of CBT is Aaron T. Beck, who began his career in psychoanalysis and embarked on systematic research into the nature of depression that eventually led to the development of CBT (Freeman, Pretzer, Fleming, & Simon, 2004). In contrast to the psychoanalytic view that depression was due to hostility that is turned inwards, Beck found that negative biases and distortions were common to conscious cognitive processes of individuals who are depressed (DeRubeis, Tang, & Beck, 2002). Subsequently, Beck identified the cognitive triad, which consists of a negative view of the self, current experiences, and the future (Beck, 1976; Beck et al., 1979). The presence of these negative views can be understood in terms of irrationality in the way we organize and interpret reality. Thus, psychological problems such as depression are the product of commonplace processes such as faulty learning and making incorrect inferences on the basis of inadequate or incorrect information, resulting in distorted thinking and irrational beliefs (Beck). Once this process begins, cognitive distortions reinforce perceptions of low self-worth, helplessness to change one's circumstances, and hopelessness about the future. Conceptualized as the relationship between thoughts, feelings, and behavior, the cognitive triad is an integral part of CBT interventions (Freeman et al., 2004).

Characteristics of CBT

There are three main features of CBT that distinguish it from other forms of psychological treatment. First, CBT is based on a cognitive conceptualization of the

processes that maintain the problem in question (Cooper et al., 2003). More specifically, treatment is derived from a theory concerning the maintenance of the problem that places central importance on the contribution of cognitive processes. For example, in the case of depression, it is proposed that the disorder is maintained to a large extent by the presence of certain characteristic depressive thoughts and assumptions regarding the self, the world, and the future (Beck, 1976). In the case of bulimia nervosa, it is proposed that a central maintaining mechanism is the tendency to judge self-worth almost exclusively in terms of shape and weight and a dichotomous (“black-and-white”) way of thinking (Fairburn, 1995). For each of these disorders, the particular cognitive theory of maintenance provides the basis for a specific cognitive-behavioral treatment.

The second main feature of CBT is that it is designed to modify the postulated cognitive maintaining mechanisms, the prediction being that this is necessary for lasting change (Cooper et al., 2003). Thus, the primary aim of CBT is to produce cognitive change while also addressing other features. The third main feature of CBT is that it uses a combination of cognitive and behavioral procedures to help identify and change the targeted maintaining mechanisms. Commonly used treatment procedures include the presentation and personalization of the relevant cognitive theory of maintenance and the use of behavioral “experiments” to help patients try new ways of behaving and test their expectations regarding the consequences of behavior change (Cooper & Fairburn, 2002). Another commonly used procedure is to systematically identify and evaluate dysfunctional thoughts and assumptions using methods such as collaborative empiricism, Socratic questioning, and guided discovery (Beck, 1976).

All therapeutic procedures implemented while conducting CBT work under the same underlying assumption. The assumption is that cognitive processes play a prominent role in the etiology and perpetuation of psychological distress, and therefore may mediate behavior change when adapted (Dobson & Dozois, 2002). In 1976, Beck identified six cognitive distortions that he believed were important components of common psychological problems. Beck's cognitive distortions were: 1) personalization, 2) polarized, dichotomous thinking, 3) magnification and minimization 4) overgeneralization, 5) selective abstraction, and 6) arbitrary inference. First, Beck described personalization as a propensity to interpret events in terms of their personal meanings. For example, a depressed person may attribute external events such as a stranger frowning, as personally relevant. Second, polarized thinking was described as the tendency to think in extremes and interpret experiences according to these extremes (Beck). For example, events may be interpreted as good or bad, terrific or terrible. Third, Beck described catastrophizing as anticipation of extreme, adverse outcomes, or the tendency to perceive something to be much more important than it really is. Fourth, overgeneralization refers to deriving a generalization on the basis of a single incident and then applying it to other incidents (Beck). Fifth, Beck described selective abstraction as the process of taking specific details out of context and formulating another idea. Last, Beck identified arbitrary inference as the process of jumping to a conclusion without evidence. Beck's identification of cognitive distortions helped to formulate the basic understanding of how thoughts relate to feelings and influence actions. Moreover, the relationship between mood, cognitions, and behaviors is an important part of the cognitive understanding of psychological problems.

In 1999, Burns expanded Beck's list of cognitive distortions and rephrased them to make them more understandable and accessible to the layperson. Burns' list of 10 cognitive distortions includes: 1) all-or-nothing thinking, 2) overgeneralization, 3) mental filter, 4) disqualifying the positive, 5) jumping to conclusions (including mind-reading and fortune-telling), 6) magnification or minimization, 7) emotional reasoning, 8) should statements, 9) labeling and mislabeling, and 10) personalization. For example, should statements refer to the use of "should" and "have to" statements to provide motivation or control behavior. Another example would be disqualifying the positive, referring to the tendency to discount positive experiences which would conflict with an individual's negative views. Cognitive distortions are observed in many disorders, and in conjunction with mood, can set the stage for a self-perpetuating cycle (Freeman et al., 2004). Human thought is subject to cognitive distortions, which can lead to erroneous conclusions that affect the way individuals perceive situations. When situations are perceived erroneously, the distortions amplify the impact of the misperceptions, which creates a self-perpetuating cycle (Freeman et al.).

The Therapeutic Process

There are a number of interventions designed to address cognitive distortions in order to break the cycles that perpetuate and amplify the client's problems. In addition, there are many possible intervention points and clients' problems are often quite complex (Freeman et al., 2004), requiring a strategic approach to therapeutic intervention that depends on the presenting problem and the individual characteristics of the client and therapist. The process of conducting CBT has been described as collaborative empiricism (Beck et al., 1979) because the therapist is attempting to work with the client to identify

the cognitions, behaviors, emotions, and other factors that contribute to client problems. Cognitive techniques are designed to enable the therapist and client to observe client behaviors and test the validity of the client's maladaptive thoughts, erroneous beliefs, and assumptions. As cognitive distortions are identified, the therapist and client can work to identify more adaptive alternatives to assist the client in making necessary changes in both cognition and behavior (Freeman et al.).

The process of identifying cognitive distortions and adapting behaviors is facilitated through specialized learning experiences with several goals in mind: 1) to monitor negative, automatic thoughts, 2) to recognize linkages between cognition, affect, and behavior, 3) to examine evidence that supports and refutes distorted cognitions, 4) to substitute more reality-based interpretations for distorted cognitions, and 5) to learn to identify and change dysfunctional beliefs that predispose one to distort experiences (Beck et al., 1979). By utilizing these techniques to adapt cognitive processes, the client and therapist can bring about positive change and effectively treat behavioral and psychological disorders.

The Role of Cognitive Factors on Health Behaviors

One of the most heuristic approaches to medical illness is the biopsychosocial model of health and illness. The biopsychosocial model posits that biological, psychological, and social factors play a complex and significant role in the development and maintenance of illness (Engle, 1977). This model is in contrast to the purely reductionist medical model designed to explain disease in terms of diagnosis and quick, simple treatment. A growing body of research points out the important role that factors such as psychosocial stress can play in health and illness (Kiecolt-Glaser, McGuire,

Robles, & Glaser, 2002; Salovey, Detweiler, Steward & Rothman, 2000; Rozanski, Blumenthal, & Kaplan, 1999). In addition, research utilizing the Millon Behavioral Medicine Diagnostic (MBMD; Millon et al., 2001), an instrument developed to identify psychosocial factors that may support or interfere with a chronically ill patient's course of medical treatment, shows that patient attitudes toward health can be important for predicting help-seeking behavior, psychological adjustment to the burdens of a chronic disease, initial psychological reactions to diagnosis of a life-threatening medical illness, the ability to make the lifestyle changes required by certain diseases, responses to rehabilitation efforts, decision making concerning treatment choices, the progression of physical disease and related physiological changes, and recovery from and survival after major medical procedures (Millon et al.). Although there is increasing acceptance within the medical field that health problems have psychological components, the National Institutes of Health (2005) emphasize the need for physicians to be trained in biopsychosocial factors that influence disease and illness, and many physicians endorse the importance of this approach for health conditions; a minority of physicians actively incorporate biopsychosocial approaches and training into their practices (Astin, Sierpuina, Forsy, & Clarridge, 2008). As the medical field continues to realize that good health care involves attention to psychological as well as physical aspects of health and illness, psychologists become increasingly valued members of medical treatment teams.

The opportunities for psychologists to work collaboratively as members of treatment teams in medical settings have increased with the growing emphasis on the mind-body interaction and the development of the biopsychosocial model (Belar, 2008; Kaslow et al., 2007). Both the medical field and psychology field have focused their

attention increasingly on promoting long-term behavior and life-style changes such as exercising more, eating healthier, and refraining from substance use. With more emphasis being placed on a variety of health-related challenges, including disease management, modification of maladaptive lifestyle behaviors, and promotion of self-care, it is important for physicians and psychologists to understand how thinking processes affect emotion and behavior, and how they are likely to influence physical health practices.

As discussed, and in accordance with cognitive theory and research, cognitive distortions contribute to psychological and behavioral disorders (Beck et al., 1993; Millon & Davis, 1996). It is reasonable to assume, based on the cognitive theory, that consistent and frequent distorted thinking may have an adverse impact on health and health practices. Research confirms that the more likely patients in medical settings are to engage in cognitive distortions, the more likely they are to engage in negative psychological and behavioral risk factors (Uhl, 2007). The implications of these findings are far reaching for cognitive behavioral clinicians who are skilled in providing strategic and efficient use of cognitive and behavioral techniques for behavior change. Being able to understand the relationship between cognitive distortions and negative health practices provides clinicians with important knowledge of how information processing patterns may be altered to promote more effective interventions in behavioral medicine contexts.

The importance of identifying relationships between cognitive distortions and negative health behaviors also has important implications in the treatment of obesity, especially in primary care settings. Researchers have suggested that cognitive factors play a role in the development and maintenance of obesity (Cooper & Fairburn, 2001; Herman & Polivy, 1984; Ogden, 2000); however, there is a paucity of empirical studies which

have examined this issue. Describing the relationship between cognitive factors and obesity, Herman and Polivy propose that food intake of restrained eaters is regulated by a cognitively determined diet boundary in which dieters attempt to replace physiological control with cognitive control, and are often unsuccessful. The unsuccessful attempts result in overeating and no actual weight loss (Herman & Polivy).

It has also been suggested that overeating may be related to cognitive distortions such as all or nothing thinking, a belief that is considered to be responsible for the high relapse rate shown by alcoholics and smokers (Marlatt & Gordon, 1985). For example, Ogden (2000) described how abstaining alcoholics often engage in all or nothing thinking, believing either in total abstinence or in relapse, which may promote the progression from lapse to full-blown relapse. Similarly, for individuals who are obese and attempting to lose weight by restraining from eating, it is possible that they engage in all or nothing thinking, which promotes the shift from a high calorie (binge) lapse to a “what the hell” relapse and subsequent overeating (Ogden). Such a transition from lapse to relapse is supported by previous research indicating that the transition is associated with changes in mood and cognitions, such as lowered self-esteem, self-blame, decreased mood (Brownell, Marlatt, Lichtenstein, & Wilson, 1986; Grilo, Shiffman, & Wing, 1989; Ogden), and distorted thinking (Ogden & Wardle, 1990). Although there is a lack of empirical research addressing the frequency of cognitive distortions among individuals who are obese and their role in the development and maintenance of obesity, the findings of these studies suggest that a relationship may exist. In sum, the relationship between cognitive distortions and factors that contribute to individuals who are obese maintaining behavioral patterns and negative health behaviors that are counterproductive to weight

loss is in need of further investigation in order to create more successful treatments for obesity.

Traditional Treatments for Obesity

Because of the complex interplay among biopsychosocial factors, obesity is a very difficult disease to manage and treat. Broadly speaking, there are three categories of weight loss options for individuals who are overweight and obese: 1) lifestyle modification (i.e., diet, exercise, and psychotherapy), 2) pharmacotherapy, and 3) bariatric surgery. According to Wadden and Osei (2002), when determining the appropriate treatment option it is important to consider the individual's weight, health status, previous weight loss attempts, behavioral readiness, and individual preferences. For example, an individual may be eligible for pharmacotherapy or bariatric surgery; however, if he or she has never participated in traditional behavioral weight loss programs then the less intensive treatment option should be selected first. In contrast, an individual with a BMI of 40 kg/m^2 , cardiovascular disease, and a long history of weight cycling is likely to have more success with long terms pharmacotherapy or bariatric surgery. Wadden and Osei suggest that individuals with a BMI of less than 30 kg/m^2 are most suited to treatments such as monitoring by a primary care physician, self-help and commercial programs, and/or behavioral weight loss programs. For individuals with a BMI of 30 kg/m^2 to 39 kg/m^2 , low-calorie, portion controlled diets and pharmacotherapy are often the most appropriate treatment options (Wadden & Osei). Individuals with a BMI of 40 kg/m^2 and greater, require special attention from health care providers and are candidates for surgical intervention utilizing a technique such as vertical banded gastroplasty, gastric bypass, and gastric banding procedures. Although these more

traditional treatments have some benefits, researchers suggest that treatments for obesity should consider the role that cognitive factors play in the development and maintenance of obesity (Cooper & Fairburn, 2001; Herman & Polivy, 1984; Ogden, 2000).

Behavior Therapy

One of the principal components of the lifestyle modification approach to the treatment of obesity is standard behavior therapy. Behavior therapy is based primarily in learning theory and involves the principles of operant and classical conditioning. There is a substantial body of evidence supporting the use of behavior therapy in the treatment of obesity (Wing, 1998). Specifically, behavior therapy has been shown to result in clinically significant weight loss, with an average loss of about 10% of initial weight among those who complete treatment (Wing, 2002). As a result of the weight loss, subsequent improvements in weight-related comorbidities are found (Fabricatore & Wadden, 2006). Although behavior therapy can effectively result in weight loss, facilitating the long-term maintenance of such losses remains a challenge to clinicians and researchers (Fabricatore & Wadden). Some researchers suggest that most weight lost through behavioral interventions is reliably regained within 5 years (Perri & Corsica, 2002; Wadden & Butryn, 2003). Thus, it appears that behavior therapy is effective in producing weight loss; however, it does not appear as effective in preventing weight regain.

The Problem of Weight Regain

Facilitating the long-term maintenance of weight loss is one of the greatest challenges in the long-term management of obesity (Perri, 1998). Research demonstrates that behavioral and pharmacological treatments for obesity are effective in producing

weight loss; however, the problem is that once treatment is stopped, the lost weight is regained. The disappointing, long-term results of behavioral treatments for obesity may be attributed to the neglect of the contribution of cognitive factors to weight regain. Over the years, behavioral treatments for obesity have been increasingly adapted to include cognitive techniques in order to elicit behavior change, to facilitate more successful weight loss, and ultimately to prevent weight regain. Nevertheless, Cooper and Fairburn (2002) argue that the inclusion of a limited number of cognitive techniques in the course of typical behavioral treatment for obesity does not qualify the intervention as cognitive behavioral treatment. Subsequently, Cooper and Fairburn argue that a targeted cognitive behavioral treatment for obesity is the best approach for preventing weight regain after successful weight loss. Accordingly, the CBT approach to the prevention of posttreatment weight regain is derived from a cognitive-behavioral analysis of the processes responsible for weight regain.

In the cognitive-behavioral analysis of weight regain, Cooper and Fairburn (2001, 2002) suggest that the failure to engage in effective weight control behavior is a result of two interrelated processes. The first process described by the researchers is a progressive decrease in the belief that weight can be controlled to a meaningful extent. It is argued that this process develops in response to the decline in the rate of weight loss experienced by most patients after 4 to 6 months of attempting to lose weight. At this point, Cooper and Fairburn believe there is a growing realization that original weight loss goals may not be achieved. In addition, there is a sense that there may be no secondary gains, such as improved physical appearance, increased self-confidence, increased activity, and a reduction in comorbid health conditions. Cooper and Fairburn propose that these

realizations lead to the belief that attempts to control weight are not worth the effort. As a result, further weight loss attempts are abandoned (Cooper & Fairburn).

When attempts at weight loss are abandoned, Cooper and Fairburn (2001, 2002) believe the second process begins to operate. Specifically, when individuals believe that goals will not be achieved and it is no longer worth the effort, weight control is completely abandoned and there is a return to prior eating habits. Subsequently, weight is regained. The cycle of behavior described by Cooper and Fairburn is paradoxical because it would be more reasonable to maintain any benefits that have been obtained through weight loss efforts, even if the benefits are not as successful as originally intended. Cooper and Fairburn believe that the reason people do not attempt to maintain a less than perfect outcome of weight loss attempts is that original weight loss goals are unrealistic and that they are not in the right frame of mind to consider or accept weight maintenance as a worthwhile goal. Moreover, when people begin to undervalue the weight loss that they have already achieved, and minimize or discount any other gains, they underestimate the extent to which they are already controlling their weight (Cooper & Fairburn). Eventually, the preoccupation with not achieving originally desired weight loss goals results in neglecting the importance of acquiring and practicing effective weight maintenance behavior (as distinct from that required for weight loss) (Cooper & Fairburn).

Cognitive Behavioral Therapy for Obesity

There are several scientifically based, cognitive behavioral weight management programs available today. First, for example, Judith Beck (2007) utilizes a cognitive behavioral approach to the treatment of obesity that helps individuals learn a set of

cognitive and behavioral skills that teaches dieters to think differently and overcome common dieting pitfalls and sabotaging thoughts. Second, the LEARN program for weight management (Brownell, 2004) is a scientifically sound and effective weight management program that incorporates cognitive behavioral techniques. Last, on the basis of the cognitive behavioral analysis of weight regain, Cooper et al. (2003) developed a cognitive behavioral treatment for obesity that addresses the cognitive obstacle of unrealistic weight loss goals that result in abandonment of weight loss attempts and the neglect of acquiring and using effective weight maintenance behaviors. The treatment program by Cooper et al. will be used to present an overview of the cognitive behavioral model of treatment for obesity.

Unlike traditional behavior therapy for obesity, CBT not only seeks to change eating and exercise behaviors, but also is aimed at the cognitive processes proposed to undermine successful weight loss and weight maintenance behavior (Cooper & Fairburn, 2002; Cooper et al., 2003). Subsequently, changes in eating and exercise behaviors are seen as the consequence of altering the cognitions that underlie these behaviors (Fabricatore, 2007). Thus, Cooper et al.'s treatment is designed not only to achieve weight loss, but also to minimize subsequent weight regain by addressing key obstacles to long-term weight control.

In order to accomplish the goals of weight loss and the prevention of weight regain, Cooper et al.'s (2003) CBT for obesity contains three distinctive elements. First, a distinction between weight loss and weight maintenance is introduced from the beginning and is maintained throughout the treatment. The distinction is also inherent in the structure of the treatment, which has two phases: 1) a weight loss phase, during which

weight loss is the goal, and 2) a weight maintenance phase, during which weight stability is the goal (Cooper & Fairburn, 2002).

The second distinctive element of Cooper et al.'s (2003) CBT for obesity is that potential obstacles to the acceptance of weight maintenance are addressed during the weight loss phase of treatment. According to the researchers, addressing potential obstacles involves three steps: 1) identification and moderation of unrealistic weight goals, 2) addressing body image concerns, and 3) direct attention to primary goals. In this phase of treatment, therapeutic goals are focused not only on weight loss, but also on the achievement of change in other areas such as appearance, self-confidence, quality of relationships, and physical fitness (Cooper et al.). In addition, emphasis is placed on learning how to identify small successes and changes as they are made in treatment, yet also recognizing that certain things will not change (e.g., body proportions). A crucial goal for the end of the weight loss phase is for patients to accept that they can engage in weight loss behaviors and successfully control their weight to a *worthwhile* extent. The purpose of this goal is to emphasize the ability to maintain weight that is already lost rather than to continue to focus on continued, unrealistic weight loss goals that ultimately result in weight regain. In the end, Cooper and Fairburn (2002) believe that this will help patients recognize their successes and promote weight stability. The third and final distinctive element of Cooper and Fairburn's (2001, 2002) CBT for obesity is helping patients to acquire and practice the behavioral skills and cognitive responses needed for effective weight control, which is the focus of the second phase of treatment.

Although it theoretically and intuitively, it makes sense that cognitive distortions may be partially responsible for problems with weight loss and weight regain, empirical

support for Cooper et al.'s (2003) CBT for obesity has not yet been published.

Nevertheless, there is empirical evidence that supports the premise that unrealistic weight goals may negatively impact the success of treatments for overweight and obesity (Foster, Wadden, Vogt, & Brewer, 1997; Wadden, Womble, Sarwer, Berkowitz, Clark, & Foster, 2003). For example, Foster et al. found that participants in behaviorally focused lifestyle modification treatments had unrealistic expectations such as hoping to lose approximately one-third of their body weight. Although a reduction of this size can be realistically expected with bariatric surgery, Foster et al. noted that it is more than three times the mean weight loss achieved with diet, exercise, and behavior therapy. In a separate study, participants seeking weight loss with a standard behavioral program continued to maintain their unrealistic weight loss expectations even after being informed of the average weight losses achieved, utilizing the behavioral approach (Wadden et al., 2003). These findings suggest that unrealistic expectations function as firmly held beliefs that result in distorted cognitive processes which ultimately undermine successful weight loss and weight maintenance behavior.

Although some research indicates that unrealistic weight-loss goals are common among persons seeking lifestyle modification, and can have a negative impact on treatment outcome, there are studies suggesting that unrealistic weight-loss goals may be associated with improved long-term weight reductions (Jeffrey, Wing, & Mayer, 1998; Linde, Jeffrey, Finch, Ng, & Rothman, 2004). For example, Linde et al. studied differences between participants' weight goals prior to the start of an 8-week behaviorally oriented lifestyle modification program. Although participants with "dream" (i.e., more unrealistic) weight loss goals did not have significantly different weight changes as

compared with participants who had more realistic weight goals at the end of treatment, they maintained significantly greater weight losses at the 18 month follow-up. These results suggest that unrealistic weight-loss goals may not inhibit long-term weight control. Thus it is evident that more research is necessary in order to determine the extent to which distorted cognitive processes impact the maintenance of weight control over time.

In sum, it is unclear whether or not there is a relationship between cognitive distortions, weight loss, and weight regain among individuals who are obese. It is evident that research is needed to examine the impact of cognitive distortions on attempts to lose weight and maintain weight loss over time. If cognitive distortions are contributing to difficulties with weight loss and weight regain, then CBT for obesity is certainly a necessity. Before such research can be conducted, however, it is necessary to determine if cognitive distortions exist among overweight and obese individuals. Moreover, it is also important to determine if the frequency of cognitive distortions varies among individuals of different weights. If there are differences in the presence and frequency of cognitive distortions between individuals who are of average weight, overweight, and obese, then it is possible that cognitive distortions are influencing behavioral factors such as negative health behaviors that impact weight loss and contribute to weight regain. Currently there is no research that has examined the presence of cognitive distortions among individuals who are of average weight, overweight and obese. Moreover, there is no research that has examined cognitive distortions in relation to negative health behaviors that influence weight loss and weight regain among such a sample. Thus the present study is designed as an initial step toward examining not only potential differences between the frequency

of cognitions among individuals of varying weights, but also the influence of cognitive distortions on behavioral factors that contribute to difficulties with weight loss and weight regain.

Chapter 3: Hypotheses/Research Questions

Research Question 1

What is the relationship between the Negative Health Habits Domain (i.e., caffeine, alcohol use, drug use, smoking, inactivity, eating), as measured by the Millon Behavioral Medicine Diagnostic (MBMD) and weight, as measured by BMI?

Hypothesis 1

Individuals who have a likely negative health habit problem area will be more likely to be obese, than those individuals who have an unlikely negative health habit problem area, as measured by the MBMD.

- 1a) Individuals who have a Likely Caffeine Problem Area score will be more likely to be obese than individuals who have an Unlikely Caffeine Problem Area score.
- 1b) Individuals who have a Likely Alcohol Problem Area score will be more likely to be obese than individuals who have an Unlikely Alcohol Problem Area score.
- 1c) Individuals who have a Likely Drug Problem Area score will be more likely to be obese than individuals who have an Unlikely Drug Problem Area score.
- 1d) Individuals who have a Likely Smoking Problem Area score will be more likely to be obese than individuals who have an Unlikely Smoking Problem Area score.
- 1e) Individuals who have a Likely Inactivity Problem Area score will be more likely to be obese than individuals who have an Unlikely Inactivity Problem Area score.
- 1f) Individuals who have a Likely Eating Problem Area score will be more likely to be obese than individuals who have an Unlikely Eating Problem Area score.

The rationale for this hypothesis is based on research indicating that negative health risk behaviors are correlated with increases in obesity rates (Horgen & Brownell, 2002; Price, 2002; Wadden & Phelan, 2002).

Research Question 2

What is the relationship between weight (i.e., average, overweight, obese), as measured by BMI, and the Psychiatric Indications Domain (i.e., Depression, Anxiety, Cognitive Dysfunction, Emotional Liability, Guardedness), as measured by the MBMD?

Hypothesis 2

- 2) Individuals who are obese will have higher scores on the Psychiatric Indications Domain than individuals who are not obese.

The rationale for this hypothesis is based on previous research indicating that individuals who are obese are at higher risk for experiencing psychological difficulties than individuals who are not obese (Bean et al., 2008; Fabricatore & Wadden, 2006; Wadden et al., 2001).

Research Question 3

What is the relationship between weight (i.e., average, overweight, obese), as measured by BMI, and the Treatment Prognostics Domain (i.e., Interventional Fragility, Medication Abuse, Problematic Compliance, Information Discomfort, Utilization of Services Scales), as measured by the Millon Behavioral Medicine Diagnostic (MBMD)?

Hypothesis 3

- 3) Individuals who are obese will have higher scores on the Treatment Prognostics Domain than individuals who are not obese.

The rationale for this hypothesis is based on previous research suggesting that individuals who are obese may have more difficulty with factors that influence the success of weight loss efforts, such as adherence to treatment recommendations (Wadden & Phelan, 2002).

Research Question 4

What is the relationship between weight (i.e., average, overweight, obese), as measured by BMI, Negative Health Habits (i.e., caffeine, alcohol use, drug use, smoking, inactivity, eating), as measured by the Millon Behavioral Medicine Diagnostic (MBMD), and distorted thinking, as measured by the Inventory of Cognitive Distortions (ICD)?

Hypothesis 4

Individuals who have a likely negative health habit problem area and are obese will have significantly higher levels of cognitive distortions, as measured by the ICD, than those individuals who have an unlikely negative health habit problem area, as measured by the MBMD, and are not obese.

4a) Individuals who have a Likely Caffeine Problem Area score and are obese will have higher frequencies of cognitive distortions than individuals who have an Unlikely Caffeine Problem Area score, and are not obese.

4b) Individuals who have a Likely Alcohol Problem Area score and are obese will have higher frequencies of cognitive distortions than individuals who have an Unlikely Alcohol Problem Area score and are not obese.

4c) Individuals who have a Likely Drug Problem Area score and are obese will have higher frequencies of cognitive distortions than individuals who have an Unlikely Drug Problem Area score and are not obese.

4d) Individuals who have a Likely Smoking Problem Area score and are obese will have higher frequencies of cognitive distortions than individuals who have an Unlikely Smoking Problem Area score and are not obese.

4e) Individuals who have a Likely Inactivity Problem Area score and are obese will have higher frequencies of cognitive distortions than individuals who have an Unlikely Inactivity Problem Area score and are not obese.

4f) Individuals who have a Likely Eating Problem Area score and are obese will have higher frequencies of cognitive distortions than individuals who have an Unlikely Eating Problem Area score and are not obese.

The rationale for this hypothesis is based on previous research indicating that negative health risk behaviors are correlated with increases in obesity rates (Horgen & Brownell, 2002; Price, 2002; Wadden & Phelan, 2002), and that individuals more likely to engage in negative health habits and behaviors (i.e., drug, eating, caffeine, inactivity, and smoking) are more likely to engage in cognitive distortions (Uhl, 2007).

Research Question 5

What is the relationship between the Psychiatric Indications Domain (i.e., Depression, Anxiety, Cognitive Dysfunction, Emotional Liability, Guardedness), as measured by the Millon Behavioral Medicine Diagnostic (MBMD) and the frequency of distorted cognitions, as measured by the Inventory of Cognitive Distortions (ICD)?

Hypothesis 5

5a) There will be a significant, positive correlation between Depression Scale scores and the total score on the ICD.

5b) There will be a significant, positive correlation between Anxiety Scale scores and the total score on the ICD.

5c) There will be a significant, positive correlation between Cognitive Dysfunction Scale scores and the total score on the ICD.

5d) There will be a significant, positive correlation between Emotional Liability Scale scores and the total score on the ICD.

5e) There will be a significant, positive correlation between Guardedness Scale scores and the total score on the ICD.

The rationale for this hypothesis is based on previous research that has found that individuals more likely to have psychiatric indications are more likely to engage in cognitive distortions (Beck et al., 1979; Uhl, 2007).

Research Question 6

What is the relationship between the Treatment Prognostics Domain (i.e., Interventional Fragility, Medication Abuse, Problematic Compliance, Information Discomfort, Utilization of Services Scales), as measured by the Millon Behavioral Medicine Diagnostic (MBMD) and the frequency of distorted cognitions, as measured by the ICD?

Hypothesis 6

6a) There will be a significant, positive correlation between Interventional Fragility Scale scores and the total score on the ICD.

6b) There will be a significant, positive correlation between Medication Abuse Scale scores and the total score on the ICD.

6c) There will be a significant, positive correlation between Problematic Compliance Scale scores and the total score on the ICD.

6d) There will be a significant, positive correlation between Information Discomfort Scale scores and the total score on the ICD.

6e) There will be a significant, positive correlation between Utilization of Services Scale scores and the total score on the ICD.

The rationale for this hypothesis is based on previous research that has found that treatment prognostics are significantly related to levels of cognitive distortions (Uhl, 2007).

Chapter 4: Methodology

Participants

The total sample comprised 385 men and women over 18 years of age.

Participants were recruited from several locations. First, participants were recruited on the campus of The Philadelphia College of Osteopathic Medicine (PCOM) in Philadelphia, Pennsylvania. Second, participants were recruited from Central Penn Health and Fitness Center in Harrisburg, Pennsylvania. Last, participants were recruited from PCOM affiliated primary care clinics in Philadelphia, Pennsylvania. Participants remained anonymous and only basic, non-identifying information was gathered. Demographic information was obtained for age, sex, race, educational level, occupation, medical conditions, primary language, household income, and a history of brain injury, head injury, psychotic disorders, or eating disorder (see Appendix A).

Participant Inclusion Criteria

Participants were required to meet predetermined conditions in order to be included in this study. First, participants had to be over 18 years of age. Second, participants had to be able to comprehend the questionnaires and, therefore, had to have at least a 6th grade education level.

Participant Exclusion Criteria

Participants were excluded from the study if they were younger than 18 years of age. Participants who were unable to comprehend the questionnaires written at a 6th grade reading level were excluded. Furthermore, individuals were excluded if they reported a history of brain injury, head injury, or psychotic disorders.

Survey/Measures

This study, which included an informational letter, three self-report questionnaires, employed the use of a physician's scale and tape measure. The informational letter informed potential participants about the general purpose of the study, and the requirements (see Appendix B). The questionnaires asked questions about cognitive distortions and psychosocial factors that may support or interfere with medical conditions. Demographic information was obtained for the following items: age, sex, race, educational level, occupation, medical conditions, primary language, household income, and a history of brain injury, head injury, psychotic disorder, and eating disorder. Information pertaining to current medical conditions was obtained to establish both a history of and current medical conditions. Primary language was obtained to determine if there was any potential for confusion about questions in the study due to a language barrier. A history of brain injury, head injury, or psychotic disorder was obtained for the purpose of excluding participants from the study. A history of an eating disorder was obtained to establish whether there was a presence of eating disorder symptomatology among the sample. Information was gathered regarding occupation and annual household income to establish the estimated socioeconomic status of participants. The total administration time of the survey packet was approximately 40 minutes.

Inventory of Cognitive Distortions (ICD)

The ICD (Yurica & DiTomasso, 2001) is a 69-item self-report inventory that is designed to measure cognitive distortions (see Appendix C). The ICD is composed of short sentences reflecting 11 factor-analyzed cognitive distortions (see Appendix D). Items are scored on a 5-point Likert-type scale, ranging from 1 (*Never*) to 5 (*Always*).

The measure is scored by summing the ratings assigned to items. Total ICD scores range from 69 to 345, with higher scores representing a higher frequency of cognitive distortions and more severe patterns of distortion.

The ICD has good internal consistency and test-retest reliability. The initial validation study of the ICD was conducted with an adult clinical population who experienced symptoms of anxiety and/or depression (Yurica, 2002). Using a sample of patients from medical practices, Uhl (2007) reported high internal consistency ($\alpha = .97$). In terms of test-retest reliability, Yurica reported a test-retest reliability of .998 for 28 adults.

Convergent validity has been demonstrated. The ICD was found to be correlated with measures of psychopathology. For example, Yurica (2002) reported that the ICD correlated with the Beck-Depression Inventory-II (BDI-II; Beck et al., 1996) ($r = .70$), measuring depression, and the Beck Anxiety Inventory (BAI; Beck & Steer, 1990) ($r = .59$), measuring anxiety. Yurica also found the ICD correlated with Weisman and Beck's Dysfunctional Attitude Scale ($r = .70$), which is a measure that assesses pervasive negative attitudes towards the self, the outside world, and the future.

The ICD has also correlated with a measure designed to assess psychological and behavioral factors that can influence the course of treatment of medically ill patients. Specifically, Uhl (2007) found the ICD correlated with 29 subscales on the MBMD. First, the ICD correlated with all 11 clinical scales that make up the MBMD Coping Style domain. The ICD most strongly correlated with the Inhibited ($r = .59$) and Dejected ($r = .59$) subscales. Second, the ICD correlated with all four of the subscales in the Psychiatric Indications domain which included, Depression ($r = .50$), Anxiety-Tension (r

= .47), Emotional Liability ($r = .43$), and Guardedness ($r = .21$). Third, the ICD correlated with five of the six Stress Moderators subscales. Specifically, correlations were .34 for Illness Apprehension, .21 for Functional Deficits, .31 for Pain Sensitivity, .36 for Social Isolation, and .31 for future Pessimism. Fourth, the ICD correlated with three of five Treatment Prognostic subscales. Specifically, correlations were .35 for Interventional Fragility, .21 for Medication Abuse, and .36 for Utilization Excess. Last, the ICD correlated with Psychiatric Referral ($r = .40$) subscale of the Management Guide domain of the MBMD.

Known group validity has also been demonstrated. Specifically, the ICD discriminated clinical outpatient samples from nonclinical control samples (Yurica, 2002). Research conducted by Rosenfield (2004) demonstrated that individuals who met criteria for any diagnosis, as measured by the MCMI-III Axis scales, on Axis I (clinical disorders) or Axis II (personality disorders), reported a higher frequency of cognitive distortions, as measured by the ICD, than individuals who were not diagnosed with a psychological disorder. Overall, the ICD has been identified as a useful tool for identifying dysfunctional cognitive processes. There are currently few instruments, if any, which are designed to assess cognitive distortions among adult populations. Thus the ICD is an invaluable instrument with multiple uses in the practice of CBT. For example, it can be used as a screening tool for identifying cognitive distortions among individuals seeking psychotherapy. Therapists can also utilize the ICD to take baseline assessments of clients and then continual assessments of progress throughout treatment, which can be extremely useful in providing evidence of a successful treatment outcome. Using the ICD in this way is supported by significant volumes of research demonstrating that cognitive

distortions correlate with a number of Axis I disorders, such as depression (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Butler & Beck, 2000; Hollan & Kendall, 1980; Rosenfield; Yurica) and anxiety (Ross, Gottfredson, Christensen, & Weaver, 1986; Yurica).

Millon Behavior Medicine Diagnostic (MBMD)

The MBMD (Millon et al., 2001) is a 165-item self-report inventory that is designed to assess psychological and behavioral factors that can influence the course of treatment of medically ill patients. The MBMD is composed of 29 Content scales grouped into five domains, as well as three Response Patterns scales, and six Negative Health Habits scales. The domains include scales that examine psychiatric indications, coping styles, stress moderators, treatment prognostics, and management guides. These scales are summarized as presented in the user manual in Appendices F and G.

MBMD items are in *true* or *false* format and raw scores are translated into Prevalence Scores (PS). The PS method of scoring is used with the MBMD rather than the more common, normalized standard t-score transformations to accommodate the naturally occurring skew found in clinical data (Millon et al., 2001). The PS identifies the presence of a disorder for the individual taking the measure, rather than identifying a position on a normal distribution curve. Thus, each disorder characteristic can be described in three levels, *Absent*, *Present*, and *Prominent*, and can range from 0 to 115. More specifically, a PS score below 35 corresponds to an asset, which is an adaptive characteristic of an individual. A PS ranging from 75 to 84 corresponds to *Present* level of liability, and a PS of 85 to 115 corresponds to a *Prominent* level of liability.

The MBMD has been found to be a psychometrically sound instrument with good internal consistency and test-retest reliability. Among the initial standardization sample of 720 patients across six major illness groups, Cronbach's alpha ranged from .76 to .89 for the Psychiatric Indications Domain, .54 to .85 for the Coping Styles Domain, .85 to .89 for the Stress Moderators Domain, .47 to .80 for the Treatment Prognostics Domain, and .77 to .79 for the Management Guides Domain. Acceptable internal consistency was also found for the entire MBMD ($\alpha = .79$). Among a sample of bariatric patients, Millon et al. (2001) found acceptable internal consistency for the entire MBMD ($\alpha = .70$).

The MBMD has also demonstrated good test-retest reliability. Using a sample of 41 individuals over 7 to 30-day intervals, Millon et al. (2001) reported correlations ranging from .79 to .88 for the Psychiatric Indications Domain; .71 to .90 for the Coping Styles Domain; .78 to .92 for the Stress Moderators Domain; .72 to .88 for the Treatment Prognostics Domain, and .78 to .81 for the Management Guides Domain. Among a sample of bariatric patients, Millon et al. reported correlations ranging from .70 to .85 for the Psychiatric Indications Domain; .56 to .80 for the Coping Styles Domain; .77 to .89 for the Stress Moderators Domain; .22 to .71 for the Treatment Prognostics Domain, and .64 to .69 for the Management Guides Domain.

The MBMD has good convergent validity. Millon et al. (2001) found the MBMD to be correlated with a variety of other measures that assess similar content domains. For example, Millon et al. found that the MBMD Depression scale correlated with the BDI-II ($r = .87$) and with the Brief Symptom Inventory Depression Scale ($r = .58$), and the MBMD Anxiety-Tension Scale correlated with the State-Trait Anxiety Inventory ($r = .74$) and the Brief Symptom Inventory Anxiety Scale ($r = .50$). Millon et al. also reported

that the MBMD Spiritual Absence Scale correlated with the Systems of Belief Inventory ($r = .85$). Millon et al. also found the MBMD to be correlated with medical staff ratings of a sample of 100 patient's attitudes and behaviors that are important to treatment outcomes (e.g., compliance, medication problems, and utilization problems). For example, the MBMD Utilization Excess Scale correlated with ratings of Utilization Problems ($r = .52$), Symptom Fabrication ($r = .41$), and Medical Complications ($r = .39$), and the MBMD Problematic Compliance Scale correlated with ratings of Compliance Issues ($r = .38$).

The MBMD is the updated version of the Millon Behavioral Health Inventory (MBHI; Millon, Green, & Meagher, 1982); however, the MBMD provides new scales (stress moderators, treatment prognostics, psychiatric indications, and management guides) and negative health habits and response patterns. Because the MBMD is a relatively new inventory, much of the research that has been conducted on its psychometric properties utilized convenience samples and may not be representative of a general medical population. Nevertheless, based on the studies utilizing convenience samples it appears that the new domains of the MBMD provide a means to conduct, comprehensively, a psychosocial assessment that yields information about psychiatric status, stress moderators, treatment prognostics, and negative health habits that can play a critical role in maintaining health, optimizing the effects of and recovery from medical treatment, and containing healthcare costs in a wide variety of medical populations (Millon et al.). A review of the literature found no research examining the relationships between cognitive distortions and the behavioral factors that influence weight loss as measured by the MBMD.

Procedure

Materials needed to implement the study were assembled into packets for each participant. A large 12" x 15" envelope contained the following questionnaires: 1) Demographic Questionnaire, 2) ICD, and 3) MBMD. In order to reduce the potential for experimenter bias, all of the packets and questionnaires included in the packet were numbered. When the participant's height and weight was obtained, the corresponding packet number was assigned to the height and weight. Thus, when BMI was calculated after the collection of the data, there was a corresponding packet number for the BMI. Thus, all participant data were analyzed without knowledge of the participant's corresponding BMI.

Participants in this study were recruited from multiple locations, including the campus of PCOM and its affiliated primary care clinics in Philadelphia, Pennsylvania, as well as the Central Penn Health and Fitness Center in Harrisburg, Pennsylvania. In all locations the responsible investigator asked all potential participants to read a brief informational letter inviting them to participate in the study and describing relevant and important details that would be likely to affect their decisions to participate; it also indicated the fact that their responses would be completely anonymous. The researcher also described the purpose and type of research being conducted. Potential participants were also informed of the expected duration of participation and the procedures that would be involved. Potential participants were advised that the study involved providing height and weight, and disclosing personal information on questionnaires that ask about behaviors, thoughts, and feelings related to physical health and well-being. Participants were also informed that if they were not comfortable with the material, that they were

under no obligation to participate. Finally, the participants were informed that responses would be recorded without identifiers and, therefore, it would be anonymous.

In the primary care clinic settings of PCOM, potential participants were asked to review the informational letter while waiting to see their physician. Participants who were unable to read the informational letter were excluded. When participants agreed to participate in the study, they were asked to complete the demographic questionnaire, which included questions that would screen participants for exclusionary criteria. After the participant completed the demographic questionnaire, the researcher examined the questionnaire and excluded any participant that did not meet the requirements for the study. Participants who met inclusion criteria completed the two remaining measures (ICD and MBMD) provided in the 12" x 15" envelope. General directions were provided, including information about their choices to discontinue participation at any time. After participants finished the measures, they were instructed to place all forms and questionnaires into the envelope and then seal it before returning it to the researcher. Participants had their height and weight measurements recorded when the nurse took them back for their appointments with the physician. Participants' height and weight data were then shared with the investigator.

In the gym setting, potential participants were approached in the lobby and asked to review the informational letter. Participants who were unable to read the informational letter were excluded. If participants were agreeable to the study, they were asked to complete the demographic questionnaire. The researcher examined the demographic questionnaire and excluded any participant that did not meet the requirements for the study. Participants who met inclusion criteria completed the remaining measures in the

12" x 15" envelope. The same general directions as provided in the primary care clinics were provided in the gym setting. After participants finished the measures, they placed them in the envelope for the researcher. Participants then had their height and weight measurements taken in a private office on a physician's standard scale. Women had the option to have their height and weight taken in the women's locker room on a physician's standard scale.

On the PCOM campus, potential participants were approached and asked to review the informational letter. Participants who were unable to read the letter were excluded. If participants were agreeable to the study, they were asked to complete the demographic questionnaire, which was used to exclude any participant that did not meet the requirements for the study. Participants who met inclusion criteria completed the remaining measures in the envelope. The same general directions as provided in the primary care clinics and gym were provided in this setting. After participants finished the measures, they placed them in the envelope for the researcher. Participants then had their height and weight measurements taken in one of two private offices, the PCOM Center for Brief Therapy or Primary Care Clinic in Roland 315 on a physician's standard scale.

In all settings, after the participant completed the demographic questionnaire, the researcher placed the participant's completed demographic questionnaire into the large manila envelope that contained the remaining questionnaires. Participants were handed the envelope and asked to complete all of the questionnaires in the packet, to the best of their ability. They were informed that they were allowed to leave at any time if they felt uncomfortable. When participants completed the packets they sealed them and returned them to the researcher. The location of the collection of data was noted on the outside of

the packet. If participants were unable to complete the packets on site they were allowed to take the packet home with them, to be returned to the researcher in a self-addressed, stamped envelope. The total administration time of the survey packet was approximately 40 minutes. Data were kept in a locked cabinet and were password-protected on a computer. Only the principal investigator, Robert DiTomaso, Ph.D., and co-investigator, Christina Berchock Shook, had access to the data.

Analyses

The data were first examined to determine if there were any outliers or missing variables. The data were then checked to determine if they met the assumptions of normality, linearity, and homoscedasticity. Before conducting analyses to determine if the data supported the hypotheses, descriptive statistics were obtained to describe the sample and to summarize the data collected on the sample. The range, mean, and standard deviation were calculated for the ICD, MBMD, annual household income, educational level, and participant age. Percentages were reported for the categorical variables in the study: participant race, primary language, sex, occupation, medical conditions, and location of data collection.

In order to conduct the analyses, participants were categorized into groups (average, overweight, and obese) based on the descriptive data collected from them. To expand, participant height and weight measurements were used to calculate their BMI, which was then used to place them into one of the three categories. Individuals with a BMI of 18.5 to 24.9 kg/m² were placed in the average group; those with a BMI of 25 to 29.9 kg/m² were placed in the overweight group and those with a BMI greater than or equal to 30 kg/m² were placed in the obese group.

Analyses were performed to determine if the data collected supported the seven hypotheses. In this study, Pearson correlations were used to determine the degree to which continuous variables were related to each other. Chi-Square Analyses were used to determine if groups differ on certain variables. Multivariate Analyses of Variance (MANOVA) was used to determine if group differences exist between the independent variables in relation to the dependent variables. In this study there were two independent variables: 1) Negative Health Habits domain, which includes 6 variables, caffeine, alcohol use, drug use, smoking, inactivity, and eating, with three levels, Unlikely, Possible, or Likely problem area, and 2) BMI, with three levels, Average, Overweight, and Obese. The dependent variables in this study were ICD total scores, Psychiatric Indications Domain Scores, and Treatment Prognostics Domain scores.

Hypotheses 1a-f: Chi-Square Analyses were conducted to determine whether or not individuals who have likely Negative Health Habits (i.e., caffeine, alcohol use, drug use, smoking, inactivity, and eating) would be more likely to be obese than individuals who have unlikely Negative Health Habits.

Hypothesis 2: MANOVAs were conducted to determine whether or not individuals who are obese would have higher scores on the Psychiatric Indications Domain Subscales than individuals who are not obese.

Hypothesis 3: MANOVAs were conducted to determine whether or not individuals who are obese would have higher scores on the Treatment Prognostics Domain Subscales than individuals who are not obese.

Hypotheses 4a-f: To determine whether or not individuals who are obese and have likely Negative Health Habits have higher frequencies of cognitive distortions than

individuals who are average weight and have unlikely Negative Health Habits, a 3 [Negative Health Habit] X 3 [BMI] ANOVAs were conducted for the dependent variable, scores on a measure of cognitive distortions (ICD).

Hypotheses 5a-e, 6a-e: Pearson correlations were conducted to determine whether or not there are positive correlations between the scales of the Psychiatric Indications Domain Subscales and Treatment Prognostics Domain Subscales, and total score on the ICD.

Chapter 5: Results

Descriptives

Participants were 56 years old on average ($M = 55.89$, $SD = 16.05$), and ranged from 19 to 82 years of age. In terms of education, years of education ranged from 9 to 23 ($M = 14.86$, $SD = 2.57$). Annual household income was \$73,400 on average ($M = 73,400.91$, $SD = 42,468.99$) and ranged from \$3,400 to \$250,000. In terms of medical conditions, participants had one medical condition, on average, ($M = 1.18$, $SD = 1.26$) with a range from 0 to 8 medical conditions per participant. As presented in Table 1, most participants had a BMI that categorized them as overweight, which requires a BMI of 25 to 29.9 kg/m². The majority of participants was female, white, and spoke English as a primary language. The majority of participants reported a cardiovascular condition as their primary medical condition. Of the minority of participants who indicated a history of an eating disorder, most reported a history of anorexia and bulimia. In addition, most participants were members of the Central Penn Health and Fitness Center in Harrisburg, Pennsylvania rather than from the campus of PCOM and its affiliated primary care clinics in Philadelphia, Pennsylvania.

Table 1

Participant Descriptive Statistics

Category	Percentage (N = 385)
BMI	
Average	31.2%
Overweight	40.8%
Obese	28.1%

Sex

Female	60.7%
Male	39.3%

Race

White	84.6%
African American	10.4%
Asian or Pacific Islander	2.1%
Hispanic	1.6%
Other	1.3%

Primary Language

English	99.2%
Spanish	0.3%
Other	0.5%

Type of Medical Condition

Cardiovascular	33.5%
Musculoskeletal	17.6%
Metabolic	16.3%
Respiratory	9.7%
Neurologic	9.0%
Gastrointestinal	4.9%
Psychological	3.1%
Autoimmune	2.4%
Cancer	1.5%

Urogenital	0.9%
Eye Condition	0.7%
Obstetric	0.4%
<hr/>	
History of Eating Disorder	
No	97.9%
Yes	1.8%
<hr/>	
Type of Previously Diagnosed Eating Disorder (N = 7)	
Anorexia/Bulimia	1.6%
Unspecified	0.3%
<hr/>	
Data Collection Location	
Fitness Center	93.5%
Primary Care Clinic	4.2%
PCOM Campus	2.3%
<hr/>	

Descriptive statistics are presented in Table 2 for the ICD total scores and the Psychiatric Indications Domain (Anxiety-Tension, Depression, Cognitive Dysfunction, Emotional Liability, Guardedness) and Treatment Prognostics Domain (Intervention Fragility vs. Interventional Resilience [IF vs. IR], Medication Abuse vs. Medication Conscientiousness [MA vs. MC], Information Discomfort vs. Information Receptivity [ID vs. IR], Utilization Excess vs. Appropriate Utilization [UE vs. AU], Problematic Compliance vs. Optimal Compliance [PC vs. OC]) of the MBMD. In terms of the ICD, the internal consistency for the ICD scale was found to be high ($\alpha = 0.967$). As seen in

Table 2, ICD scores ranged from 69 to 345, which reflect a range from no distorted thinking to being often engaging in distorted thinking.

Table 2

Descriptive Statistics for Scales

	Range	Mean	Standard Deviation
ICD	69-285	156.14	35.54
Psychiatric Indications			
Anxiety-Tension	0-107	36.11	25.59
Depression	0-110	33.89	25.96
Cognitive Dysfunction	0-93	24.57	16.61
Emotional Liability	0-95	41.59	21.75
Guardedness	0-90	49.64	20.55
Treatment Prognostics			
IF vs. IR	0-125	35.93	21.70
MA vs. MC	0-101	38.24	23.19
ID vs. IR	0-105	44.85	32.65
UE vs. AU	0-114	46.91	24.37
PC vs. OC	0-130	66.09	23.57

In terms of the Psychiatric Indications domain of the MBMD, average participant scores were within the normal range on the Anxiety-Tension, Emotional Liability, and Guardedness subscales. Average participant scores on the Depression and Cognitive Dysfunction subscales were lower than 35, corresponding to an asset, which is an

adaptive characteristic of an individual (Millon et al., 2001). On the Treatment Prognostics domain of the MBMD, average participant scores were within the normal range for each subscale. However, participant scores were higher on the subscale Problematic Compliance vs. Optimal Compliance, and scores were lower on the subscale measuring Intervention Fragility vs. Interventional Resilience and Medication Abuse vs. Medication Conscientiousness.

Correlations

Pearson's correlations were used to examine correlations among the continuous variables: scores on the ICD, MBMD, participant BMI, age, years of education, number of medical conditions, and household income (see Table 3). Correlations indicated that scores on the ICD were significantly correlated with number of medical conditions and participant age. Participants scoring higher on the ICD, indicating higher frequency of cognitive distortions and more severe patterns of distortion, reported being younger in age and as having a greater number of medical conditions.

As seen in Table 3, significant correlations were found between the subscales of the MBMD and participant age, years of education, number of medical conditions, and annual household income. Participants scoring higher on the Anxiety-Tension, Emotional Liability, and Intervention Fragility, Problematic Compliance subscales of the MBMD, indicating higher levels of anxiety and tension, emotional instability, and inability to adjust to physically and psychologically stressful medical interventions, and lack of adherence and compliance to medical instruction, were younger in age. Persons scoring higher on the Depression, Information Discomfort, Cognitive Dysfunction, and Guardedness subscales of the MBMD, indicating higher levels of depression, lack of

receptivity to information about diagnostic, prognostic, and treatment procedures and outcomes, developmental deterioration of the brain, and mistrust and defensiveness, reported a greater number of medical conditions. Persons who scored higher on the Cognitive Dysfunction, Guardedness, Medication Abuse, and Problematic Compliance subscales of the MBMD, indicating higher levels of developmental deterioration of the brain, mistrust and defensiveness, problems with or misuse of prescribed medication, and lack of adherence and compliance to medical instruction, reported fewer years of education.

Participant BMI was significantly correlated with participant age, years of education, number of medical conditions, and scores on the Depression, Cognitive Dysfunction, Emotional Liability, Medication Abuse vs. Medication Conscientiousness, and Utilization Excess vs. Appropriate Utilization (see Table 3). Participants with higher BMI's, reported being older in age, having fewer years of education, and a greater number of medical conditions. In addition, higher BMI was associated with higher levels of depression, developmental deterioration of the brain (Cognitive Dysfunction), emotional instability (Emotional Liability), problems with or misuse of prescribed medication (Medication Abuse), and the use of medical services more often than the average person with a similar medical condition (Utilization Excess).

Participant age and years of education were significantly correlated with number of medical conditions and annual household income. Older participants reported fewer years of education and a greater number of medical conditions. Participants with more years of education also reported fewer numbers of medical conditions and a greater household income.

Table 3

Correlation Table

Variables	BMI	ICD	Anxiety-Tension	Depression	Emotional	Cognitive	Guardedness	IF	MA
BMI	-								
ICD	.07	-							
Anxiety-Tension	.00	.45*	-						
Depression	.17**	.45**	.46**	-					
Emotional	.11**	.46**	.62**	.39**	-				
Cognitive	.12*	.29**	.49**	.45**	.34**	-			
Guardedness	.06	.26**	.26**	.24**	.37**	.15**	-		
IF	.01	.36**	.68**	.34**	.50**	.38**	.37**	-	
MA	.12*	.28**	.24**	.21**	.28**	.21**	.47**	.29**	-
ID	-.03	-.06	.03	-.08	-.08	-.02	-.21**	-.05	-.14**
UE	.12*	.34**	.38**	.39**	.41**	.31**	.48**	.38**	.36**
PC	-.08	-.04	-.15**	-.19**	-.16**	-.16**	-.23**	-.17**	-.14**

Table 3 (cont'd)

Correlation Table

Variables	BMI	ICD	Anxiety-Tension	Depression	Emotional	Cognitive	Guardedness	IF	MA
Age	.11*	-.17**	-.21**	-.01	-.14**	-.01	.01	-.15**	.05
Education	-.13*	-.01	-.06	-.02	-.08	-.11*	-.17**	-.10	-.11*
Medical	.18**	.13*	.04	.17**	.07	.16**	-.16**	.01	.07
Income	-.04	-.06	.06	-.08	-.03	-.14*	-.08	.07	.03

Table 3 (cont'd)

Correlation Table

Variables	ID	UE	PC	Age	Education	Medical	Income
ID	-						
UE	-.21**	-					
PC	.32**	-.29**	-				
Age	-.16**	-.10	-.16**	-			
Education	.10	-.05	.11*	-.22**	-		
Medical	-.15**	.03	-.08	.27**	-.12*	-	
Income	-.05	-.04	.10	-.11	.26**	-.13*	-

Note. Variable Abbreviations: Emotional Liability = Emotional, Cognitive Dysfunction = Cognitive, Intervention Fragility = IF, Medication Abuse = MA, Information Discomfort = ID, Utilization Excess = UE, Problematic Compliance = PC, Medical Conditions = Medical.

N = 385.

* $p < .05$. ** $p < .001$.

*Group Differences among Participants who were Obese**Hypotheses 1a-f: Differences in Negative Health Habits*

Chi-square analyses were conducted in order to determine whether or not individuals who have likely Negative Health Habits (i.e., caffeine, alcohol use, drug use, smoking, inactivity, and eating) would be more likely to be obese than individuals who have unlikely Negative Health Habits. There were significant relationships between BMI category (i.e., average weight, overweight, obese) and the Negative Health Habits categories of inactivity ($\chi^2(4, N = 385) = 54.34, p = .000$) and eating ($\chi^2(4, N = 385) = 24.16, p = .000$), but there were no significant relationships between the variables of caffeine ($\chi^2(4, N = 385) = 2.36, p = .67$), alcohol use ($\chi^2(4, N = 385) = 7.59, p = .11$), drug use ($\chi^2(4, N = 385) = 6.42, p = .17$), and smoking ($\chi^2(4, N = 385) = 7.46, p = .11$). More specifically, the results indicated that 1.7% of average weight people had a likely eating problem; 5.1% of overweight people had a likely eating problem, and 10.2% of obese people had a likely eating problem. In addition, 0.8% of average weight people had a likely inactivity problem; 5.1% of overweight people had a likely inactivity problem, and 6.5% of obese people had a likely inactivity problem.

Hypothesis 2: Differences in Psychiatric Indications

To determine whether or not individuals who are obese would have higher scores on the Psychiatric Indications Domain Subscales than individuals who are not obese, a MANOVA was conducted for the dependent variables, scores on the subscales of Anxiety-Tension, Depression, Cognitive Dysfunction, Emotional Liability, and Guardedness. The Box's Test was not significant for this hypothesis, $F(30, 391129.57) = 1.45, p = .054$. MANOVA results revealed significant differences among the BMI

categories (i.e., average, overweight, and obese) on the dependent variables, Wilks' $\Lambda = .946$, $F(10, 756) = 2.14$, $p = .019$, partial $\eta^2 = .028$. ANOVA was conducted on each dependent variable as a follow-up test to MANOVA. The results indicated that the dependent variable of depression was significantly affected by BMI category, ($F(2, 382) = 3.50$, $p = .031$, partial $\eta^2 = .018$), but Anxiety-Tension, ($F(2, 382) = 0.42$, $p = .655$, partial $\eta^2 = .002$), Cognitive Dysfunction ($F(2, 382) = 2.08$, $p = .127$, partial $\eta^2 = .011$), Emotional Liability, ($F(2, 382) = 0.85$, $p = .428$, partial $\eta^2 = .004$), and Guardedness, ($F(2, 382) = 0.65$, $p = .523$, partial $\eta^2 = .003$), were not significantly affected by BMI category. Follow-up Tukey analyses indicated that participants who were obese ($M = 39.27$, $SD = 28.67$) had higher levels of depression than participants who were average weight ($M = 30.58$, $SD = 24.15$).

Hypothesis 3: Differences in Treatment Prognostics

To determine whether or not individuals who are obese would have higher scores on the Treatment Prognostics Domain Subscales than individuals who are not obese, a MANOVA was conducted for the dependent variables, scores on the subscales of Utilization Excess, Information Discomfort, Medication Abuse, Problematic Compliance, and Intervention Fragility. The Box's Test was not significant for this hypothesis, $F(30, 391129.57) = 1.18$, $p = .231$. MANOVA results revealed there were no significant differences among the BMI categories (i.e., average, overweight, and obese) on the dependent variables (Wilks' $\Lambda = .99$, $F(10, 756) = .396$, $p = .949$, partial $\eta^2 = .005$).

Hypotheses 4a-f: Differences in Cognitive Distortions

To determine whether or not individuals who are obese and have likely Negative Health Habits would have higher frequencies of cognitive distortions than individuals

who are of average weight and have unlikely Negative Health Habits, a 3 [Negative Health Habit] X 3 [BMI] ANOVA was conducted for the dependent variable, scores on a measure of cognitive distortions (ICD).

Caffeine. ANOVA results showed a significant main effect for the Negative Health Habit of Caffeine Problem, ($F(2, 376) = 9.05, p = .000$, partial $\eta^2 = .046$), but not for BMI category ($F(2, 376) = 1.95, p = .144$, partial $\eta^2 = .010$). Interaction between factors was not significant ($F(4, 376) = 1.65, p = .160$, partial $\eta^2 = .017$). Tukey post hoc analysis revealed that ICD total scores of participants who had a possible caffeine problem ($M = 174.99, SD = 5.51$) were significantly higher than those who had an unlikely caffeine problem ($M = 153.78, SD = 1.93$) and a likely caffeine problem ($M = 180.36, SD = 10.78$).

Alcohol. ANOVA results revealed no significant interaction between the Negative Health Habit problem area of Alcohol Problem and BMI Category. In addition, there were no significant main effects.

Drug Problem. ANOVA results showed a significant main effect for the Negative Health Habit of Drug Problem, ($F(2, 377) = 7.72, p = .001$, partial $\eta^2 = .039$), but not for BMI category ($F(2, 377) = .97, p = .381$, partial $\eta^2 = .005$). Interaction between factors was not significant ($F(3, 377) = .35, p = .792$, partial $\eta^2 = .003$). Tukey post hoc analysis revealed that ICD total scores of participants who had a likely drug problem ($M = 189.17, SD = 14.28$) and a possible drug problem ($M = 178.61, SD = 7.60$), were significantly higher than those who had an unlikely drug problem ($M = 154.52, SD = 1.88$).

Smoking Problem. ANOVA results revealed no significant interaction between the Negative Health Habit problem area of Smoking Problem and BMI Category. In addition, there were no significant main effects.

Inactivity Problem. ANOVA results revealed no significant interaction between the Negative Health Habit problem area of Inactivity Problem and BMI Category. In addition, there were no significant main effects.

Eating Problem. ANOVA results showed a significant main effect for the Negative Health Habit of Eating Problem, ($F(2, 376) = 11.91, p = .000, \text{partial } \eta^2 = .060$), but not for BMI category ($F(2, 376) = .32, p = .728, \text{partial } \eta^2 = .002$). Interaction between factors was not significant ($F(3, 376) = .78, p = .540, \text{partial } \eta^2 = .008$). Tukey post hoc analysis revealed that ICD total scores of participants who had a likely eating problem ($M = 180.95, SD = 9.66$) and a possible eating problem ($M = 162.94, SD = 2.99$), were significantly higher than those who had an unlikely eating problem ($M = 146.68, SD = 2.69$).

The Relationship between the MBMD and Total ICD Scores

Hypotheses 5a-e: Psychiatric Indications

Pearson correlations were conducted to determine whether or not there were positive correlations between the Psychiatric Indications domain subscales of the MBMD and total score on the ICD. Correlations indicated that scores on the ICD were significantly correlated with the Anxiety-Tension, Depression, Cognitive Dysfunction, Emotional Liability, and Guardedness subscales of the MBMD. Participants scoring higher on the ICD, indicating higher frequency of cognitive distortions and more severe patterns of distortion, reported higher levels of anxiety and tension, depression,

developmental deterioration of the brain (Cognitive Dysfunction), emotional instability (Emotional Liability), and mistrust and defensiveness (Guardedness).

Hypotheses 6a-e: Treatment Prognostics

Pearson correlations were conducted to determine whether or not there were positive correlations between the Treatment Prognostics domain subscales of the MBMD and total score on the ICD. Correlations indicated that scores on the ICD were significantly correlated with the Intervention Fragility, Medication Abuse, and Utilization Excess. Scores on the ICD were not significantly correlated with Information Discomfort and Problematic Compliance. Participants who scored higher on the ICD, indicating higher frequency of cognitive distortions and more severe patterns of distortion, reported higher levels of inability to adjust to physically and psychologically stressful medical interventions (Intervention Fragility), problems with or misuse of prescribed medication (Medication Abuse), and utilization of medical services, compared with the average person with a similar medical condition (Utilization Excess).

Additional Data Analyses

A regression analysis was conducted to determine how BMI would change when any one of the Psychiatric Indications or ICD independent variables was varied, while the others were held fixed. Anxiety-Tension, $t(380) = 2.62, p = .009$, Depression $t(380) = 3.31, p = .001$, $t(380) = 2.33, p = .021$, were significant predictors of BMI. The sum ICD scores did not significantly predict BMI, $t(380) = -.12, p = .916$. Adjusted R-squared for this model was .04, suggesting that 4 % of the variability for BMI was accounted for by Anxiety-Tension, Depression, and Emotional Liability scores.

Pearson's correlations were used to examine correlations among participant BMI, scores on the ICD scales of Fortunetelling and Magnification, and scores on the Anxiety-Tension, Depression, and Emotional Liability subscales of the Psychiatric Indications Domain of the MBMD. The cognitive distortion, Magnification, is the tendency to exaggerate or magnify either the positive or negative consequences of some personal trait, event, or circumstance (Burns & Seligman, 1989; Burns, 1999), while Fortune-Telling, is the process of foretelling or predicting a future event or events and believing that this prediction is absolutely true for oneself (Burns & Seligman; Burns). Correlations indicated that participant BMI was not significantly correlated with scores on the ICD scales of Magnification and Fortune-Telling. Nevertheless, scores on the Anxiety-Tension, Depression, and Emotional Liability subscales were significantly correlated with scores on the ICD scales of Magnification and Fortune-Telling. To expand, persons who scored higher on the Anxiety-Tension, Depression, and Emotional Liability subscales, indicating higher levels of anxiety and tension, depression, and emotional instability, also reported higher scores on the Magnification and Fortune-Telling scales, indicating a greater tendency to exaggerate or magnify either the positive or negative consequences of some personal trait, event, or circumstance and a greater tendency to predict a future event is absolutely true for oneself.

Chapter 6: Discussion

Summary of Findings

This study was designed to investigate the relationship between the frequency of cognitive distortions, as measured by the ICD, and psychological and behavioral factors, as measured by the MBMD, which includes negative health habits, psychiatric indications, and treatment prognostics among a sample of individuals who are of average weight, overweight, and obese. One of the primary reasons for conducting this study was to examine further how behavioral, psychosocial, and cognitive variables may differ among individuals who are obese, overweight, and of average weight in an effort to understand what contributes to individuals' maintaining behavioral patterns and negative health behaviors that are counterproductive to weight loss and which contribute to weight regain. It was expected that the identification of distorted cognitions associated with negative health behaviors that contribute to the maintenance of obesity would offer clinicians and primary care providers an increased understanding of how distorted cognitions impact the health of the individuals they treat. Subsequently, cognitive behavioral treatments could be tailored to individuals, and referrals could be made to mental health clinicians to produce more successful weight loss, prevention of weight regain, and overall health outcomes. This study produced several significant, positive findings, which are presented in terms of their implications in the context of current research and literature.

Most of the participants engaging in this study were members of the Central Penn Health and Fitness Center in Harrisburg, Pennsylvania, who had a BMI that categorized them as overweight. Participants completed the MBMD and ICD, and reported average

participant scores in the normal range of possible scores on both measures. This indicated that the majority of the participants in this study fell within the normal range in terms of distorted thinking patterns, negative health habits, psychiatric indications, and treatment prognostics.

Of the six sets of hypotheses in this study, five sets produced several significant, positive findings. The important implications of these findings and their relationship to the literature on obesity are examined below. First, the role of negative health habits is examined. Second, psychiatric indications related to obesity are considered. Third, the role of cognitive distortions is discussed. Fourth, treatment prognostics are examined. Fifth, the relationship between cognitive distortions and psychiatric indications is reviewed. Last, the role of cognitive distortions in treatment prognostics is examined.

Group Differences based on Obesity

Negative Health Habits

Partial support was found for the hypotheses that tested whether or not individuals who have likely Negative Health Habits would be more prone to being obese than individuals who have unlikely Negative Health Habits. Specifically, the results indicated that there were significant relationships between BMI category, inactivity, and eating habits. These findings support research indicating that negative health risk behaviors such as inactivity and overeating are correlated with increased obesity rates (Horgen & Brownell, 2002; Price, 2002; Wadden & Phelan, 2002). According to Horgen and Brownell, the obesity epidemic is a normal response to abnormal eating and physical activity levels among individuals in industrialized countries such as the United States. For example, daily energy expenditure decreased substantially as our nation changed

from an agricultural to an industrial economy; technological advances have facilitated sedentary behavior, and the availability of energy-dense foods with large portion sizes has made it quite easy to overeat (Tsai, Carvajal, Egner, & Wadden, 2009). The important role of environmental factors on eating and activity levels is evidenced by statistics suggesting that energy expenditure from low-level activities is thought to have decreased by 300-500 calories per day since the 1950's (Steffen et al., 2006); fewer than 50% of Americans engage in regular physical activity (Centers for Disease Control and Prevention, 2006), and the number of calories consumed by individuals has increased by approximately 12% from the years, 1971-1974 to 1999-2002 (Kant & Graubard, 2006).

The dramatic influence of inactivity and overeating on obesity is also evidenced by the recommendation that individuals who are obese should lose weight through moderate caloric restriction and increased physical activity. This lifestyle modification approach or behavioral weight control approach is considered the cornerstone of treatment for all overweight and obese individuals (National Heart, Lung, and Blood Institute, 2000), and it has been found to be an effective treatment approach for obesity (Wadden, Berkowitz, Sarwer, Prus-Wisniewski, & Steinberg, 2001; Wadden, Berkowitz, et al., 2005; Wadden, Butryn, & Byrne, 2004). The incorporation of behavioral principles in the lifestyle modification approach provides opportunities for psychologists to become pivotal members of treatment teams with their skill and training in behavior modification. With the lifestyle modification approach encompassing dietary change, physical activity, and behavior modification, psychologists can use their skills to conduct assessments, consultations, treatment, and research that ultimately helps individuals adopt new eating

and activity habits to reach weight loss goals more successfully (for a review see Wadden, Butryn, & Wilson, 2007).

Psychiatric Indications

Hypothesis testing revealed that individuals who are obese had higher scores on the Psychiatric Indications Domain Subscale of Depression than individuals who are not obese. This finding is consistent with previous research indicating that individuals who are obese experience higher levels of depression than individuals who are not obese (Bean et al., 2008; Fabricatore & Wadden, 2006; Wadden et al., 2001). The results also indicated that Anxiety-Tension, Cognitive Dysfunction, Emotional Liability, and Guardedness were not significantly affected by BMI, which is consistent with previous research on the psychological consequences of obesity among nationally representative samples (Carpenter et al., 2000). These findings suggest that individuals who are obese do not tend to be more anxious or emotionally labile than average weight individuals. Instead, individuals who are obese tend to experience more symptoms of depression.

The relationship between obesity and mood is complex. In contrast to previous research suggesting that depression uniformly led to obesity, it appears that obesity and depression share a bi-directional relationship (Tsai et al., 2009). More specifically, researchers suggest that weight gain can lead to depressed mood or depressed mood can lead to weight gain (Stunkard, Faith, & Allison, 2003). This view is consistent with the diagnostic criteria for a major depressive disorder in the *DSM-IV-TR*, which states that depression may be characterized by significant weight loss or weight gain, or decreased or increased appetite (APA, 2000). Contributing to the complexity of the relationship between depression and obesity are some studies finding that depression is more common

among individuals who are obese, yet in other studies, individuals who are obese differ minimally in terms of depression unless they fall into the identified subgroups of women, extremely obese individuals, and individuals with binge-eating disorder (Bean et al., 2008; Fabricatore & Wadden, 2006; Wadden, et al., 2001). It is possible that among these groups, the psychosocial consequences of obesity (e.g., social discrimination and poor quality of life) that can affect relationships, employment, physical health, and personal well-being, contribute to higher levels of sadness, guilt, feelings of hopelessness, and ultimately, to depression.

Cognitive Distortions

In this study, individuals who are obese and have likely Negative Health Habits were expected to have higher frequencies of cognitive distortions than individuals who are average weight and have unlikely Negative Health Habits. These hypotheses were only partially supported. The rationale for these hypotheses was based on previous research indicating that negative health risk behaviors are correlated with increases in obesity rates (Horgen & Brownell, 2002; Price, 2002; Wadden & Phelan, 2002), and that individuals more likely to engage in Negative Health Habits (i.e., drug, eating, caffeine, inactivity, and smoking), as measured by the MBMD are more likely to engage in cognitive distortions (Uhl, 2007). Although previous research supported the hypothesis that an interaction may be present between BMI and Negative Health Habits for the ICD, there were no interactions found for any of these hypotheses. The results revealed only significant main effects for the Negative Health Habits of Drug Problem and Eating Problem, but not for BMI, meaning that participants who engaged in more cognitive distortions were more likely to have a drug problem or eating problem. These findings

are consistent with previous research that predicted that people who are likely to have a Negative Health Habit problem such as inactivity, eating, smoking, or caffeine use will also have significantly higher levels of cognitive distortions than those individuals who are unlikely to have Negative Health Habit problems (Uhl).

The lack of a significant interaction between obesity and Negative Health Habits found in this study suggested that these two factors do not interact to produce an impact on levels of cognitive distortions. Instead, it appears that regardless of whether or not an individual is obese, overweight, or of average weight, individuals who are more likely to have a problem with eating or with drugs have significantly higher levels of cognitive distortions. This finding can be conceptualized in terms of the cognitive model (Beck et al., 1979). For example, individuals who have more negative biases and distortions about themselves, about their current experiences, and about the future are more easily prone to interpret reality and life experiences irrationally. Subsequently, they may also be more easily prone to engage in negative health habits such as overeating or drug use because distorted thinking and irrational beliefs reinforce perceptions of helplessness to be able to change one's negative health habits. Research suggests that overeating may be related to cognitive distortions such as all or nothing thinking, which are the distortions also considered to be responsible for the high relapse rate shown by alcoholics and smokers (Marlatt & Gordon, 1985). For example, Ogden (2000) described how abstaining alcoholics often engage in all or nothing thinking, believing in either total abstinence or in relapse, which may promote the progression from lapse to full-blown relapse. Similarly, for individuals who are attempting to lose weight by restraining from eating, it is possible that they engage in all or nothing thinking, which promotes the shift from a

high calorie (binge) lapse to a “what the hell” relapse and subsequent overeating (Ogden). It is possible that among the individuals in this study, the relationship between the frequency and severity of cognitive distortions such as all or nothing thinking significantly impacted the ability to moderate overeating and drug use.

Treatment Prognostics

The hypotheses tested to determine whether or not individuals who are obese would have higher scores on the Treatment Prognostics Domain Subscales than individuals who are not obese, were not supported. These findings are in contrast to previous studies which have found that individuals who are obese may have more difficulty with factors that influence the success of weight loss efforts, such as adherence to treatment recommendations (Wadden & Phelan, 2002). This is surprising because the recommendations for weight loss are characterized by adherence to caloric restriction through changing nutritional choices and increasing physical activity and exercise. Assuming that the individuals in this study have some non-adherence issues because they are obese and have difficulty adhering to caloric and exercise requirements, it could also be assumed that they may have other adherence difficulties, such as utilizing medical services in excess and noncompliance with treatment recommendations. In this study, however, individuals who are obese did not have behavioral or attitudinal aspects that would complicate the ability to comply with treatment indications and recommendations as measured by this domain on the MBMD.

There are several reasons why individuals who are obese among this sample did not have more difficulty with treatment adherence and prognostics. First, consistent with the research on social discrimination and obesity, it may be inappropriate and judgmental

to assume that just because someone is obese, he or she is noncompliant with treatment recommendations and has adherence problems. Second, it may be that individuals who are obese in this sample, which was obtained primarily from a fitness center, do not have more difficulty complying with treatment recommendations in other areas of their lives because they are already complying with the recommendation to add exercise and fitness into their lives. The fact that individuals in this study already engage in some form of exercise suggests that they are already exhibiting some degree of understanding and compliance with the idea that attending a fitness center is part of maintaining a healthy lifestyle. Last, regardless of whether or not individuals who are obese in this sample are attending the fitness center to lose weight or have already started to lose weight, they are already demonstrating adherence to the notion that behavioral change and compliance with recommendations are part of the overall picture that is required to lose weight and maintain physical health.

*The Relationship between Psychological and Behavioral Factors
and Cognitive Distortions*

Psychiatric Indications

In this study, hypothesis testing revealed positive correlations between the Psychiatric Indications domain subscales of the MBMD and total score on the ICD. Participants scoring higher on the ICD, indicating higher frequency of cognitive distortions and more severe patterns of distortion, reported higher levels of anxiety and tension, depression, developmental deterioration of the brain (cognitive dysfunction), emotional instability, and mistrust and defensiveness. These findings are consistent with previous research that found that individuals more likely to have higher levels of

psychiatric indications on the MBMD were more likely to have higher levels of cognitive distortions (Uhl, 2007). These findings were also consistent with the cognitive model of emotional disorders (Beck et al., 1979) as well as Yurica and DiTomasso's (Yurica, 2002) ICD development research. In addition, they support the findings of Rosenfield (2004), who found that cognitive distortions are correlated with the number and severity of psychological disorders across diagnostic axes. Overall, this study suggests that individuals with higher levels of cognitive distortions are more easily prone to psychological problems such as depression, anxiety, mood lability, mistrust and defensiveness. Consistent with Beck's (1976) cognitive triad, this would suggest that individuals who have more negative biases and distortions about themselves, about their current experiences, and about the future are more prone to interpret reality and life experiences irrationally. Subsequently, psychological problems such as depression result when, for example, distorted thinking and irrational beliefs reinforce perceptions of low self-worth, helplessness to change one's circumstances, and hopelessness about the future. In sum, the findings of this study lend further support for the belief that cognitive distortions underlie a range of psychological disorders and that a treatment such as cognitive behavioral therapy, which involves cognitive restructuring through identification, evaluation, and response to cognitive distortions, can have a significant impact on psychological disorders.

Treatment Prognostics

In this study, hypotheses that tested whether or not there were positive correlations between the Treatment Prognostics domain subscales of the MBMD and total score on the ICD were partially supported. Participants scoring higher on the ICD,

indicating higher frequency of cognitive distortions and more severe patterns of distortion, reported higher levels of inability to adjust to physically and psychologically stressful medical interventions, to misuse of prescribed medication, and to excessive utilization of medical services. These findings were consistent with previous research that found that individuals more likely to have problematic treatment prognostics on the MBMD were more likely to have higher levels of cognitive distortions (Uhl, 2007). These findings support the growing body of research emphasizing the important role that psychosocial stress can play in health and illness (Kiecolt-Glaser et al., 2002, Salovey et al., 2000; Rozanski et al., 1999), as well as Millon et al.'s (2001) research on the MBMD, which found evidence that psychosocial factors can support or interfere with the course of medical diagnosis, prognosis, and treatment.

Finding that individuals who engage in more frequent and severe distorted thinking patterns are more likely to have difficulty adjusting to stressful medical interventions, to misuse medications, and to utilize medical services excessively has important implications for treatment. For instance, the inability to adhere with treatment recommendations is a common concern and is surprisingly high in primary care settings (DiTomasso, Chiumento, Singer, & Bullock, 2009). If consistent and frequent distorted thinking has an adverse impact on health and overall health practices, then cognitive behavioral clinicians can be of great assistance to physicians. The myriad of factors that contribute to noncompliance with treatment can be difficult to assess; however, the cognitive behavioral clinician is skilled at focusing on thoughts, attitudes, beliefs, behaviors, feelings, and situational factors. Thus, clinicians working with physicians and incorporating cognitive behavioral methods into their overall consideration of the role of

biological, cognitive, behavioral, social, psychological, and spiritual factors into the assessment and treatment of medical conditions may contribute to an improved ability to comply with treatment recommendations and to better outcomes for individuals with medical conditions.

Implications

Consistent with prior research, the results of this study indicated that negative health risk behaviors such as inactivity and overeating, as well as depression were associated with increased obesity rates. The findings of this study did not suggest that individuals who are obese engage in higher levels of distorted thinking. Instead, the results confirmed previous research indicating that there was a relationship between the frequency of cognitive distortions and psychological and behavioral factors, such as negative health habits, psychiatric indications, and treatment prognostics. Specifically, the findings suggested that individuals who engage in cognitive distortions are more likely to engage in negative psychological and behavioral risk factors. The implication for individuals who engage in cognitive distortions is that they are more likely to experience psychological problems such as depression, anxiety, and mood lability, to engage in negative health behaviors such as problematic eating, and to have difficulty managing behavioral and medical problems. Overall, it appears that although obesity alone is not associated with increased cognitive distortions, distorted thinking impacts individuals' abilities to manage psychosocial and behavioral problems, which are part of the multifaceted and complex interaction of variables that impact the development and course of obesity.

Based on previous research it seemed intuitive to reason that if cognitive distortions were associated with more psychological and behavioral problems, and obesity was associated with more psychological and behavioral problems, there may be a connection between cognitive distortions and obesity that would help us understand what contributes to individuals maintaining behavioral patterns and negative health behaviors that are counterproductive to weight loss and contribute to weight regain. Nevertheless, in this study, no interaction was found between cognitive distortions, obesity, and psychological and behavioral problems. It is possible that the measure of cognitive distortions utilized in this study, the ICD, which was developed as a measure of general distorted thinking as it pertains to psychological disorders, was too general to identify specific eating, weight, and food-related attitudes and distorted cognitions which are engaged in by individuals who are obese and are struggling with weight loss. Thus a scale designed specifically to examine eating, weight, and food-related cognitive distortions may have found a stronger connection between cognitive distortions, obesity, and psychological and behavioral problems.

On the other hand, one of the main implications of the lack of interaction between cognitive distortions, obesity, and psychological and behavioral problems, is that it appears cognitive distortions rather than obesity may be contributing to problematic medical behaviors and psychological problems. Thus obesity is not necessarily impacting individuals' abilities to manage psychological problems such as depression and treatment prognostics, or such as compliance with medical recommendations which can impact the course of obesity. Instead, it appears that cognitive distortions are impacting individuals' abilities to manage psychosocial and behavioral problems, which are part of the

multifaceted and complex interaction of variables that impact the development and course of obesity.

Gaining further evidence that there is a strong relationship between cognitive distortions and psychological and behavioral factors lends further support for one of the most heuristic approaches to medical illness, which is the biopsychosocial model. The biopsychosocial model posits the idea that biological, psychological, and social factors play a complex and significant role in the development and maintenance of medical conditions (Engle, 1977). These findings also support the movement to allow psychologists to work collaboratively as members of treatment teams in medical settings. With more emphasis being placed on disease management, modification of maladaptive lifestyle behaviors, and promotions of coping and self-care, it is important for psychologists to be able to demonstrate how thinking processes affect emotion and behavior, and how they are likely to influence physical health practices.

The findings of this study also support cognitive theory and research that cognitive distortions contribute to psychological and behavioral disorders. With the recognition that psychological and behavioral factors influence the course of general medical conditions and interfere with the treatment of general medical conditions, these findings lend support for the utilization of cognitive behavioral treatments in medical settings. The implications of these findings are far reaching for cognitive behavioral clinicians who are skilled in providing strategic and efficient use of cognitive and behavioral strategies for behavior change. Being able to extend to clinicians and primary care providers an increased understanding of how distorted cognitions are impacting the health of the individuals that they treat provides clinicians with important knowledge of

how information processing patterns may be altered to promote more effective interventions in behavioral medicine settings. Subsequently, cognitive behavioral treatments can be tailored to individuals and referrals can be made to mental health clinicians to produce more successful management of mental and physical health conditions. Ultimately, this will result in more frequent, positive treatment outcomes, decreased rates of morbidity and mortality, and reduced health care costs.

Limitations

There were a number of methodological issues that merit consideration in evaluation of this study. First it is important to consider several potential issues related to the sample. Although participants were surveyed in three possible locations, the majority of the sample came from the health and fitness center in Harrisburg, Pennsylvania. Subsequently, this sample could be biased by the fact that most participants were from one location and that they were already engaging in some form of exercise program. Moreover, it is possible that there were differences in the thinking patterns of participants who were active members of a fitness center, engaging in regular exercise, and possibly more highly motivated to attend to their health and physical well-being. Future research would benefit from the inclusion of more participants from other settings, as well as more participants from the primary care clinics in order to be able to differentiate clearly between individuals with medical conditions versus those that are engaging in health and fitness activities. This would also decrease the possibility of biased results due to sampling participants from only one location.

A second methodological limitation of this study was that it relied on self-report measures. Social desirability or fear of a lack of anonymity may have limited the

findings. Although participants were informed that answers were completely anonymous, they may not have believed this to be true. Participants in this study needed to have an awareness of their thoughts and a willingness to respond honestly to questions about their health-related behaviors and attitudes. Participants may have worried that the researcher would know who they were, based upon their answers, and subsequently did not answer the survey questions honestly. It is possible that some participants may have attempted to portray themselves in the best light possible. It is also possible that the individuals who chose to participate in this study were fundamentally different from those who did not choose to participate.

Suggestions for Future Research

The ICD was developed as a measure of general distorted thinking as it pertains to psychological disorders and was not developed as a specific measure of weight-related attitudes and distorted cognitions related to eating behaviors. Thus, a scale examining eating-related cognitive distortions more specifically may have resulted in finding a significant interaction between cognitive distortions, obesity, and psychological and behavioral problems.

Future research could focus on developing a scale similar to the ICD that would tap into cognitions hypothesized by Cooper and Fairburn (2002) to be specific to those engaged in by individuals who are obese and struggle with failed weight loss attempts. For example, the measure could ask questions about having unrealistic expectations about weight loss, black and white thinking about the probability of achieving weight loss goals, discounting the positives in regard to undervaluing weight loss achievements,

minimizing or discounting any other gains, and underestimating the extent to which weight is already being controlled (Cooper & Fairburn).

Evidence that there is a strong relationship between cognitive distortions and psychological and behavioral factors has wide reaching implications for physicians and psychologists, including the way in which patient care is provided in a medical practice setting. Another area worthy of continued investigation would be for clinical health psychologists to utilize the ICD, which can identify maladaptive levels of cognitive distortions, as a means of identifying and tracking change in cognitive distortions while treating patients in medical settings. The ICD could be utilized in conjunction with other outcome measures to assess behavioral change and medical outcomes when treating individuals in specific medical populations. Ultimately, this could serve to produce more successful management of mental and physical health conditions. Future research could also further develop the ICD for use in a medical setting by examining it with different samples of patients with varying medical conditions in order to demonstrate its utility with different medical populations.

As suggested by Uhl (2007), a final area of investigation could be the development of a short form of the ICD may also be a useful task for primary care practice work by clinical health psychologists. Future research could eliminate some of the redundant questions in the ICD and potentially increase the utility of the ICD for research purposes in primary care settings. Ultimately, this would allow researchers to more efficiently utilize the ICD, hopefully resulting in more positive treatment outcomes, decreased rates of morbidity and mortality, and reduced health care costs.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Astin, J. A., Sierpina, V. S., Forys, K. L., & Clarridge, B. (2008). Intergration of the biopsychosocial model: Perspectives of medical students and residents. *Academic Medicine, 83*, 20-27.
- Baik, I., Ascherio, A., & Rimm, E. B. (2000). Adiposity and mortality in men. *American Journal of Epidemiology, 152*, 264-271.
- Bean, M. K., Stewart, K., & Olbrisch, M. (2008). Obesity in America: Implications for clinical and health psychologists. *Journal of Clinical Psychology in Medical Settings, 15*, 214-224.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities.
- Beck, A. T., Freeman, A., & Davis, D. D. (1993). *Cognitive therapy of personality disorders*. New York: Guilford.
- Beck, A. T., Rush, J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York: Guilford.
- Beck, A. T., & Steer, R. A. (1990). *The Beck Anxiety Inventory Manual*. The Psychological Corporation.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *BDI-II manual*. San Antonio, TX: Psychological Corporation.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561-571.

- Beck, J. S. (2007). *The Beck diet solution: Train your brain to think like a thin person*. Birmingham, AL: Oxmoor House.
- Belar, C. (2008). Clinical health psychology: A health care specialty in professional psychology. *Professional Psychology: Research and Practice, 39*, 229-233.
- Bergstrom, A., Pisani, P., Tenet, V., Wolk, A., & Adomi, H. O. (2001). Overweight as an avoidable cause of cancer in Europe. *International Journal of Cancer, 91*, 421-430.
- Berkowitz, R. I., & Fabricatore, A. N. (2005). Obesity, psychiatric status, and psychiatric medications. *Psychiatric Clinics of North America, 28*, 39-54.
- Brody, M. L., Walsh, T., & Devlin, M. J. (1994). Binge eating disorder: Reliability and validity of a new diagnostic category. *Journal of Consulting and Clinical Psychology, 62*, 381-386.
- Brownell, K. D. (2004). The LEARN program for weight management. Dallas, TX: American Health Publishing.
- Brownell, K. D., Marlatt, G. A., Lichtenstein, E., & Wilson, G. T. (1986). Understanding and preventing relapse. *American Psychologist, 41*, 765-782.
- Burns, D. D. (1999). *Feeling good: The new mood therapy*. New York: Avon Books.
- Burns, M. O., & Seligman, M. P. (1989). Explanatory style across the life span: Evidence for stability over 52 years. *Journal of Personality and Social Psychology, 56*, 471-477.
- Butler, A. C., & Beck, J. S. (2000). Cognitive therapy outcomes: A review of meta-analyses. *Journal of the Norwegian Psychological Association, 37*, 1-9.
- Calle, E. E., Rodriguez, C., Walker-Thurmond, K., & Thun, M. J. (2003). Overweight,

obesity and mortality from cancer in a prospectively studied cohort of U.S. adults. *New England Journal of Medicine*, 348, 1625-1638.

- Carpenter, K. M., Hasin, D. S., Allison, D. B., & Faith, M. S. (2000). Relationships between obesity and DSM-IV major depressive disorder, suicide ideation, and suicide attempts: Results from a general population study. *American Journal of Public Health*, 90, 251-257.
- Centers for Disease Control and Prevention (2006). *SHPPS: School health policies and programs study*. Retrieved May 12, 2010, from <http://www.cdc.gov/HealthyYouth/shpps/>
- Cooper, Z., & Fairburn, C. G. (2001). A new cognitive behavioural approach to the treatment of obesity. *Behaviour Research and Therapy*, 39, 499-511.
- Cooper, Z., & Fairburn, C. G. (2002). Cognitive-behavioral treatment of obesity. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 465-479). New York: Guilford.
- Cooper, Z., Fairburn, C. G., & Hawker, D. M. (2003). *Cognitive-behavioral treatment of obesity: A clinician's guide*. New York: Guilford.
- DeRubeis, R. J., Tang, T. Z., & Beck, A. T. (2002). Cognitive therapy. In K. S. Dobson (Ed.), *Handbook of cognitive-behavioral therapies* (2nd ed., pp. 349-392). New York: Guilford.
- DiTomasso, R. A., Chiumento, D., Singer, M. S., & Bullock, O. (2009). Nonadherence in Primary Care. In R. A. DiTomasso, B. A. Golden, & H. J. Morris (Eds.), *Handbook of cognitive behavioral approaches in primary care* (pp. 291-316). New York: Springer.

- Dobson, K. S., & Dozois, D. J. (2002). Historical and philosophical bases of the cognitive-behavioral therapies. In K. S. Dobson (Ed.), *Handbook of cognitive-behavioral therapies* (2nd ed., pp. 3-39). New York: Guilford.
- Eldredge, K. L., & Agras, W. S. (1996). Weight and shape overconcern and emotional eating in binge eating disorder. *International Journal of Eating Disorders, 19*, 73-82.
- Engle, G. L. (1977). The need for a new medical model. *Science, 196*, 129-136.
- Fabricatore, A. N. (2007). Behavior therapy and cognitive-behavioral therapy of obesity: Is there a difference? *Journal of the American Dietetic Association, 107*, 92-99.
- Fabricatore, A. N., & Wadden, T. A. (2003). Psychological functioning of obese individuals. *Diabetes Spectrum, 16*, 245-252.
- Fabricatore, A. N., & Wadden, T. A. (2004). Psychological aspects of obesity. *Clinics in Dermatology, 22*, 332-337.
- Fabricatore, A. N., & Wadden, T. A. (2006). Obesity. *Annual Review of Clinical Psychology, 2*, 357-377.
- Fairburn, C. G. (1995). Short-term psychological treatments for bulimia nervosa. In K. D. Brownell, & C. G. Fairburn (Eds.), *Eating disorders and obesity: A comprehensive handbook* (p. 344-348). New York: Guilford.
- Field, A. E., Barnoya, J., & Colditz, G. A. (2002). Epidemiology and health and economic consequences of obesity. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 3-18). New York: Guilford.
- Fine, J. T., Colditz, G. A., Coakley, E. H., Moseley, G., Manson, J. E., Willett, W. C., et al. (1999). A prospective study of weight change and health-related quality of life

- in women. *Journal of the American Medical Association*, 282, 2136-2142.
- Flegal, K. M., Carroll, M. D., Ogden, C. L., & Johnson, C. L. (2002). Prevalence and trends in obesity among U.S. adults, 1999-2000. *The Journal of the American Medical Association*, 288, 1723-1727.
- Flegal, K. M., Graubard, B. I., Williamson, D. F., & Gail, M. H. (2005). Excess deaths associated with underweight, overweight, and obesity. *Journal of the American Medical Association*, 293, 1861-1867.
- Fobi, M. A. (2004). Surgical treatment of obesity: A review. *Journal of the National Medical Association*, 96, 61-75.
- Foster, G. D., Wadden, T. A., Vogt, R. A., & Brewer, G. A. (1997). What is a reasonable weight loss? Patients' expectations and evaluations of obesity treatment outcomes. *Journal of Consulting and Clinical Psychology*, 65, 79-85.
- Freeman, A., & DeWolf, R. (1992). *The 10 dumbest mistakes smart people make and how to avoid them*. New York: HarperCollins.
- Freeman, A., & Oster, C. (1999). Cognitive behavior therapy. In M. Hersen, & A. S. Bellack (Eds.), *Handbook of interventions for adult disorders* (2nd ed., pp. 108-138). New York: Wiley and Sons.
- Freeman, A., Pretzer, J., Fleming, B., & Simon, K. M. (2004). *Clinical applications of cognitive therapy* (2nd ed.). New York: Kluwer Academic/Plenum.
- Friedman, M. A., & Brownell, K. D. (1995). Psychological correlates of Obesity: Moving to the next research generation. *Psychological Bulletin*, 117, 3-20.
- Goldschmidt, A. N., Jones, M., Manwaring, J. L., Luce, K. H., Osborne, M. L., Cunning, D., et al. (2008). The clinical significance of loss of control over eating in

- overweight adolescents. *The International Journal of Eating Disorders*, 41, 153-158.
- Gortmaker, S. L., Must, A., Perrin, J. M., Sobol, A. M., & Dietz, W. H. (1993). Social and economic consequences of overweight in adolescence and young adulthood. *New England Journal of Medicine*, 329, 1008-1112.
- Grilo, C. M., Shiffman, S., & Wing, R. R. (1989). Relapse crisis and coping among dieters. *Journal of Consulting and Clinical Psychology*, 57, 488-495.
- Hedley, A. A., Ogden, C. L., Johnson, C. L., Carroll, M. D., Curtin, L. R., & Flegal, K. M. (2004). Prevalence of overweight and obesity among U.S. children, adolescents, and adults, 1999-2002. *The Journal of the American Medical Association*, 291, 2847-2850.
- Herman, C. P., & Polivy, J. A. (1984). A boundary model for the regulation of eating. In A. J. Stunkard, & E. Stellar (Eds.), *Eating and its disorders* (pp. 141-156). New York: Raven.
- Hollan, S. D., & Kendall, P. C. (1980). Cognitive self-statements in depression: Development of an Automatic Thoughts Questionnaire. *Cognitive Therapy and Research*, 4, 383-395.
- Horgen, K. B., & Brownell, K. D. (2002). Confronting the toxic environment: Environmental and public health actions in a world crisis. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 95-106). New York: Guilford.
- Istvan, J., Zavela, K., & Weidner, G. (1992). Body weight and psychological distress in NHANES I. *International Journal of Obesity*, 16, 999-1003.

- Jeffery, R. W., Drewnowski, A., Epstein, L. H., Stunkard, A. J., Wilson, G. T., & Wing, R. R. (2000). Long-term maintenance of weight loss: Current status. *Health Psychology, 19*, 5-16.
- Jeffery, R. W., Wing, R. R., & Mayer, R. R. (1998). Are smaller weight losses or more achievable weight loss goals better in the long term for obese patients? *Journal of Consulting and Clinical Psychology, 66*, 641-645.
- Kant, A. K., & Graubard, B. I. (2006). Secular trends in patterns of self-reported food consumption of adult Americans: NHANES 1971-1975 to NHANES 1999-2002. *American Journal of Clinical Nutrition, 84*, 1215-1223.
- Kaslow, N., Bollini, A., Druss, B., Glueckauf, R., Goldfrank, L., Kelleher, K., et al. (2007). Health care for the whole person: Research update. *Professional Psychology: Research and Practice, 38*, 278-289.
- Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., & Glaser, R. (2002). Psychoneuroimmunology: Psychological influences on immune function and health. *Journal of Consulting and Clinical Psychology, 70*, 537-547.
- Kuehnel, R. H., & Wadden, T. A. (1994). Binge eating disorder, weight cycling, and psychopathology. *International Journal of Eating Disorders, 15*, 321-329.
- Li, Z., Bowerman, S., & Heber, D. (2005). Health ramifications of the obesity epidemic. *The Surgical Clinics of North America, 85*, 681-701.
- Linde, J. A., Jeffery, R. W., Finch, E. A., Ng, M. D., & Rothman, A. J. (2004). Are unrealistic weight loss goals associated with outcomes for overweight women? *Obesity Research, 12*, 569-576.
- Manson, J. E., Willett, W. C., Stampfer, M. J., Colditz, G. A., Hunter, D. J., Hankinson,

- S. E., et al. (1995). Body weight and mortality among women. *New England Journal of Medicine*, 333, 677-685.
- Marlatt, G. A., & Gordon, J. R. (1985). *Relapse prevention*. New York: Guilford.
- Millon, T., & Davis, R. D. (1996). *Disorders of personality. DSM-IV and beyond* (2nd ed.). New York: Wiley.
- Millon, T., Antoni, M., Millon, C. M., Meager, S., & Grossman, S. (2001). *Millon Behavioral Medicine Diagnostic Manual*. Minneapolis, MN: Pearson.
- Millon, T., Green, C., & Meagher, R. (1982). *Millon Behavioral Health Inventory Manual* (3rd ed.). Minneapolis: National Computer Systems.
- Mussell, M. P., Mitchell, J. E., de Zwaan, M., Crosby, R. D., Seim, H. C., & Crow, S. J. (1996). Clinical characteristics associated with binge eating in obese females: A descriptive study. *International Journal of Obesity*, 20, 324-331.
- Mussell, M. P., Peterson, C. B., Weller, C. L., Crosby, R. D., de Zwaan, M., & Mitchell, J. E. (1996). Differences in body image and depression among obese women with and without binge eating disorder. *Obesity Research*, 4, 431-439.
- National Heart, Lung, and Blood Institute. (2000). *The practical guide: Identification, evaluation, and treatment of overweight and obesity in adults*. Bethesda, MD: National Institute of Health.
- National Institutes of Health. (2005). Strengthening behavioral and social sciences in medical schools. Retrieved February 16, 2010, from http://www.grants.nih.gov/grants/guide/search_results.htm
- Ogden, C. L., Carroll, M. D., McDowell, M. A., & Flegal, K. M. (2007). *Obesity among adults in the United States - no statistically significant changes since 2003-2004*.

- (NCBS Report No. 1). Hyattsville, MD: National Center for Health Statistics.
- Ogden, J. (2000). *Health psychology: A textbook* (2nd ed.). Philadelphia: Open University.
- Ogden, J., & Wardle, J. (1990). Control of eating and attributional style. *British Journal of Clinical Psychology, 29*, 445-446.
- Onyike, C. U., Crum, R. M., Lee, H. B., Lyketsos, C. G., & Eaton, W. W. (2003). Is obesity associated with major depression? Results from the Third National Health and Nutrition Examination Survey. *American Journal of Epidemiology, 158*, 1139-1147.
- Peeters, A., Barendregt, J. J., Willekens, F., Mackenbach, J. P., Al Mamun, A., & Bonneux, L. (2003). Obesity in adulthood and its consequences for life expectancy: A life-table analysis. *Annals of Internal Medicine, 138*, 24-32.
- Penny, H. &. (2007). Anti-fat prejudice among children: The 'mere proximity' effect in 5-10 year olds. *Journal of Experimental Social Psychology, 43*, 678-683.
- Perri, M. G. (1998). The maintenance of treatment effects in the long-term management of obesity. *Clinical Psychology: Science and Practice, 5*, 526-543.
- Perri, M. G., & Corsica, J. A. (2002). Improving the maintenance of weight lost in behavioral treatment of obesity. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 357-379). New York: Guilford.
- Pi-Sunyer, P. X. (1993). Medical hazards of obesity. *Annals of Internal medicine, 119*, 655-660.
- Price, R. A. (2002). Genetics and common obesities: Background, current status, strategies, and future prospects. In A. T. Wadden, & A. J. Stunkard (Eds.),

Handbook of Obesity Treatment (pp. 73-94). New York: Guilford.

- Puhl, R., & Brownell, K. (2006). Confronting and coping with weight stigma: An investigation of overweight and obese adults. *Obesity, 14*, 1802-1815.
- Rexrode, K. M., Hennekens, C. H., Willett, W. C., Colditz, G. A., Stampfer, M. J., Rich-Edwards, J. W., et al. (1997). A prospective study of body mass index, weight change, and risk of stroke in women. *Journal of the American Medical Association, 277*, 1539-1545.
- Rosenfield, B. M. (2004). *The relationship between cognitive distortions and psychological disorders across diagnostic axes*. Unpublished doctoral dissertation. Philadelphia College of Osteopathic Medicine.
- Ross, S. M., Gottfredson, D. K., Christensen, P., & Weaver, R. (1986). Cognitive self-statements in depression: Findings across clinical populations. *Cognitive Therapy and Research, 10*, 159-166.
- Rozanski, A., Blumenthal, J. A., & Kaplan, J. (1999). Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. *Circulation, 99*, 2192-2217.
- Rumpel, C., Ingram, D. D., Harris, T. B., & Madans, J. (1994). The association between weight change and psychological well-being in women. *International Journal of Obesity, 18*, 179-183.
- Salovey, P., Detweiler, J. B., Steward, W. T., & Rothman, A. J. (2000). Emotional states and physical health. *American Psychologist, 55*, 110-121.
- Schwartz, M. B., & Brownell, K. D. (2002). Obesity and body image. In T. F. Cash, & T. Pruzinsky (Eds.), *Body image: A handbook of theory, research, and clinical*

practice (pp. 200-209). New York: Guilford.

- Specker, S., de Zwann, M., Raymond, N., & Mitchell, J. (1994). Psychopathology in subgroups of obese women with and without binge eating disorder. *Comprehensive Psychiatry*, *35*, 185-190.
- Steffen, L. M., Arnett, D. K., Blackburn, H., Shah, G., Armstrong, C., Luepker, R. V., et al. (2006). Population trends in leisure-time physical activity: Minnesota Heart Survey, 1980-2000. *Medicine & Science in Sports & Exercise*, *38*, 1716-1723.
- Stein, C. J., & Colditz, G. A. (2004). The epidemic of obesity. *The Journal of Clinical Endocrinology and Metabolism*, *89*, 2522-2525.
- Stunkard, A. J. (2002). Binge eating disorder and the night eating syndrome. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 107-121). New York: Guilford.
- Stunkard, A. J., Faith, M. S., & Allison, K. C. (2003). Depression and obesity. *Biological Psychiatry*, *54*, 330-337.
- Stunkard, A. J., & Wadden, T. A. (1992). Psychological aspects of severe obesity. *American Journal of Clinical Nutrition*, *55*, 534S-532S.
- Tanofsky, M. B., Wilfley, D. E., Spurrell, E. B., Welch, R., & Brownell, K. (1997). Comparison of men and women with binge eating disorder. *International Journal of Eating Disorders*, *21*, 49-54.
- Telch, C. F., & Agras, W. S. (1994). Obesity, binge eating, and psychopathology. *International Journal of Eating Disorders*, *15*, 53-62.
- Tsai, A. G., Carvajal, R., Egner, R., & Wadden, T. A. (2009). Obesity. In R. A. DiTomaso, B. A. Golden, & H. J. Morris (Eds.), *Handbook of cognitive*

- behavioral approaches in primary care* (pp. 595-630). New York: Springer.
- Uhl, J. K. (2007). *The relationship between cognitive distortions and psychological and behavioral factors in a family medicine outpatient sample*. Unpublished doctoral dissertation. Philadelphia College of Osteopathic Medicine.
- U.S. Department of Health and Human Services, National Institutes of Health. (1998). *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report*. (NIH Publication No. 98-4083). Retrieved September 19, 2009, from http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf
- Wadden, T. A., Berkowitz, R. L., Sarwer, D. B., Prus-Wisniewski, R., & Steinberg, C. (2001). Benefits of lifestyle modification in the pharmacologic treatment of obesity: A randomized trial. *Archives of Internal Medicine, 161*, 218-227.
- Wadden, T. A., Berkowitz, R. I., Womble, L. G., Sarwer, D. B., Phelan, S., Cato, R. K., et al. (2005). Randomized trial of lifestyle modification and pharmacotherapy for obesity. *New England Journal of Medicine, 353*, 2111-2120.
- Wadden, T. A., Brownell, K. D., & Foster, G. D. (2002). Obesity: Responding to the global epidemic. *Journal of Consulting and Clinical Psychology, 70*, 510-525.
- Wadden, T. A., & Butryn, M. L. (2003). Behavioral treatment of obesity. *Endocrinology Metabolism Clinics of North America, 32*, 981-1003.
- Wadden, T. A., Butryn, M. L., & Byrne, K. J. (2004). Efficacy of lifestyle modification for long-term weight control. *Obesity Research, 12*, 151S-162S.
- Wadden, T. A., Butryn, M. L., & Wilson, C. (2007). Lifestyle modification for the management of obesity. *Gastroenterology, 132*, 2226-2238.

- Wadden, T. A., Foster, G. D., Letizia, K. A., & Wilk, J. E. (1993). Metabolic and psychological characteristics of obese binge eaters. *International Journal of Eating Disorders, 14*, 17-25.
- Wadden, T. A., & Osei, S. (2002). The treatment of obesity: An overview. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 229-248). New York: Guilford.
- Wadden, T. A., & Phelan, S. (2002). Behavioral assessment of the obese patient. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 186-226). New York: Guilford.
- Wadden, T. A., Sarwer, D. B., Womble, L. G., Foster, G. D., McGuckin, B. G., & Schimmel, A. (2001). Psychosocial aspects of obesity and obesity surgery [Electronic version]. *Surgical Clinics of North America, 81*, 1001-1024.
- Wadden, T. A., & Stunkard, A. J. (1985). Social and psychological consequences of obesity. *Annals of Internal Medicine, 103*, 1062-1067.
- Wadden, T. A., Womble, K. G., Sarwer, D. B., Berkowitz, R. I., Clark, V. L., & Foster, G. D. (2003). Great expectations: "I'm losing 25% of my weight no matter what you say.". *Journal of Consulting and Clinical Psychology, 71*, 1084-1087.
- Wadden, T. A., Womble, L. G., Stunkard, A. J., & Anderson, D. A. (2002). Psychosocial consequences of obesity and weight loss. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 144-169). New York: Guilford.
- Williamson, D. A., & Martin, C. K. (1999). Binge eating disorder: A review of the literature after publication of DSM-IV. *Eating and Weight Disorders, 4*, 103-114.
- Wilson, G. T., & Brownell, K. D. (2002). Behavioral treatment for obesity. In C. G.

- Fairburn & K. D. Brownell (Eds.), *Eating disorders and obesity: A comprehensive handbook* (2nd ed., pp. 524-528). New York: Guilford.
- Wing, R. R. (1998). Behavioral approaches to the treatment of obesity. In G. A. Bray, C. Bouchard, & W. P. James (Eds.), *Handbook of obesity* (2nd ed., pp. 67-93). New York: Marcel Dekker.
- Wing, R. R. (2002). Behavioral weight control. In T. A. Wadden, & A. J. Stunkard (Eds.), *Handbook of obesity treatment* (pp. 301-316). New York: Guilford.
- World Health Organization. (2005). *Obesity and overweight*. Retrieved January 21, 2010, from <http://www.who.int/mediacentre/factsheets/fs311/en/index.html>
- Yurica, C. (2002). *Inventory of Cognitive Distortions: Validation of a psychometric instrument for the measurement of cognitive distortions*. Unpublished doctoral dissertation. Philadelphia College of Osteopathic Medicine.
- Yurica, C., & DiTomasso, R. A. (2001). *Inventory of Cognitive Distortions*. (Available from Robert DiTomasso, Ph.D., ABPP, 4170 City Avenue, Philadelphia, PA 19131).

Appendix A

Demographic Questionnaire

1. How old are you? _____
2. How would you describe yourself?
 - a. Male
 - b. Female
3. What is your race? (select 1 or more boxes)

a. Black or African American	c. White
b. Asian or Other Pacific Islander	d. Hispanic
c. Other: _____	
4. What is the highest grade you have completed in school? _____
5. What is your current occupation? _____
6. What is your primary language?
 - a. English
 - b. Spanish
 - c. Other: _____
7. Please list any medical conditions you have:
8. Have you ever experienced a brain injury or severe head injury?
 - a. Yes (please explain): _____
 - b. No
9. Have you ever been diagnosed with a psychotic disorder?
 - a. Yes
 - b. No
10. Have you ever or are you currently being treated for an eating disorder?
 - a. Yes (please specify type): _____
 - b. No
11. Please provide an estimate of your annual household income: _____

Appendix B

Informational Letter

Dear Participant:

The Philadelphia College of Osteopathic Medicine's Psychology Department is currently conducting a study on the relationship between people's beliefs, health behaviors, and their weight. We would like your help in understanding how thinking patterns relate to behaviors that impact health, weight, and well-being.

If you agree to be in this study, you will be asked to complete three questionnaires that will take about 40 minutes of your time. You will also be asked to step on a scale for a weight measurement. Your height will be measured with a tape measure. Your participation in this study is completely voluntary and you may decide not to participate or to stop your participation at any point with no questions asked or consequences to you.

The items in these questionnaires ask about your feelings, thoughts, behaviors, and other personal information. You may find participating in this study was a positive experience in which you learned a few things that you did not know about yourself. However, some people may experience some discomfort upon completion of the questionnaires. In the unlikely event that this should occur, please alert the investigator about your concerns.

Please remember that your responses will be recorded with no identifying information. There will be no identifying information connected with any of your answers. Therefore, do not sign or put your name on any of the questionnaires. Thank you for your time and effort in considering your participation in this study.

If you are interested in the results of the study, you may contact one of the investigators by the following e-mail address: christinabe@pcom.edu. This study is being conducted in partial fulfillment of the requirements for the Degree of Doctor of Psychology.

Thank you for your participation.

Sincerely,

Christina Berchock Shook, M.A.
Robert A. DiTomasso, Ph.D., Professor and Chairman
Department of Psychology
Philadelphia College of Osteopathic Medicine
Department of Psychology
4190 City Avenue
Philadelphia, PA 19120

Appendix C

Inventory of Cognitive Distortions

ICD

C.L. Yurica, LCSW and R.A. DiTomasso, PhD, ABPP Copyright 2001

ICD Form A

Name: (NO NAME)

Instructions: Below you will find a list of 69 statements that represent the ways people think or feel about themselves, others or situations. Please read each statement carefully and rate **how often you tend to think or feel this way**. **Circle the corresponding response that most accurately reflects your answers**. There are no right or wrong answers. Please respond to each statement as honestly as possible. **Please mark every item.**

How to Mark Your Responses

Be certain to circle the letter you choose completely, like this

N R S **O** A

If you wish to change a response mark an X through it

and circle your new choice, like this: **N** R S ~~O~~ A

Circle **N** if you **never** think or feel this way.
 Circle **R** if you **rarely** think or feel this way.
 Circle **S** if you **sometimes** think or feel this way.
 Circle **O** if you **often** think or feel this way.
 Circle **A** if you **always** think or feel this way.

- | | |
|---|-----------|
| 1. I need others to approve of me in order to feel that I am worth something..... | N R S O A |
| 2. I feel like a fortune teller, predicting bad things will happen to me..... | N R S O A |
| 3. I believe others think about me in a negative way..... | N R S O A |
| 4. I tend to discount the good things about me..... | N R S O A |
| 5. I either like a person or do not, there is no in-between for me..... | N R S O A |
| 6. I minimize the importance of even serious situations..... | N R S O A |
| 7. I compare myself to others all the time..... | N R S O A |
| 8. I amplify things well beyond their real importance in my life..... | N R S O A |
| 9. I act as if I have a crystal ball, forecasting negative events in my life..... | N R S O A |
| 10. What others think about me is more important than what I think about myself..... | N R S O A |
| 11. Regrets in my life stem from things I should have done, but did not do..... | N R S O A |
| 12. I make decisions on the basis of my feelings..... | N R S O A |
| 13. I draw conclusions without carefully reviewing necessary details..... | N R S O A |
| 14. If a problem develops in my life, you can bet it has something to do with the way I am..... | N R S O A |

- | | |
|---|-----------|
| 15. To feel good, I need others to recognize me..... | N R S O A |
| 16. I motivate myself according to how I should be..... | N R S O A |
| 17. I have a tendency to blame myself for bad things..... | N R S O A |
| 18. Without even asking, I think other people see me in a negative light..... | N R S O A |
| 19. I do few things as well as others..... | N R S O A |
| 20. I hold myself responsible for things that are beyond my control..... | N R S O A |
| 21. I tend to disqualify the positive traits I have..... | N R S O A |
| 22. Things seem to go all right or all wrong in my world..... | N R S O A |
| 23. I tend to pick out negative details in a situation and dwell on them..... | N R S O A |
| 24. I have a tendency to exaggerate the importance of minor events..... | N R S O A |
| 25. I attempt to achieve perfection in all areas of my life..... | N R S O A |
| 26. I have a habit of predicting that things will go wrong in any given
situation..... | N R S O A |
| 27. I have a lot of should, oughts, and musts in my life..... | N R S O A |
| 28. I downplay my accomplishments..... | N R S O A |
| 29. I call myself negative names..... | N R S O A |
| 30. I have been known to make a mountain out of a mole hill..... | N R S O A |
| 31. Most people are better at things than I am..... | N R S O A |
| 32. I have a tendency to exaggerate the importance of even small events..... | N R S O A |
| 33. When a new rule comes out at work, school, or home,
I think it must have been made because of something I did..... | N R S O A |
| 34. When faced with several possible outcomes,
I tend to think the worst is going to happen..... | N R S O A |
| 35. Compared to other people like me, I find myself lacking..... | N R S O A |
| 36. I believe my negative forecasts about my future will come to pass..... | N R S O A |
| 37. Things ought to be a certain way..... | N R S O A |
| 38. I typically imagine terrible consequences from my mistakes..... | N R S O A |
| 39. When I think about it, I am quite perfectionistic..... | N R S O A |
| 40. If I feel a certain way about something, I am usually right..... | N R S O A |

- | | |
|---|-----------|
| 41. I need a lot of praise from others to feel good about myself..... | N R S O A |
| 42. In my mind, things are either black or white, there are no grey areas..... | N R S O A |
| 43. I typically make judgments without checking out all of the facts
beforehand..... | N R S O A |
| 44. People only say nice things to me because they want something or
because they are trying to flatter me..... | N R S O A |
| 45. I find I have a tendency to minimize the consequences of my actions,
especially if they result in negative outcomes..... | N R S O A |
| 46. I find that I frequently need feedback from others to obtain a
sense of comfort about myself..... | N R S O A |
| 47. I jump to conclusions without considering alternative points of view..... | N R S O A |
| 48. As far as my life goes, things are either great or horrible..... | N R S O A |
| 49. I label myself with negative words..... | N R S O A |
| 50. I find myself assuming blame for things..... | N R S O A |
| 51. I tend to dwell on the dark lining of a silver cloud..... | N R S O A |
| 52. The positive things in my life just do not count for much at all..... | N R S O A |
| 53. I must have things a given way in my life..... | N R S O A |
| 54. I believe I know how someone feels about me
without him/her ever saying so..... | N R S O A |
| 55. My negative predictions usually come true..... | N R S O A |
| 56. My feelings reflect the way things are..... | N R S O A |
| 57. It is important to strive for perfection in everything I do..... | N R S O A |
| 58. I tend to downplay compliments..... | N R S O A |
| 59. When something negative happens, it is just terrible..... | N R S O A |
| 60. My feelings are an accurate reflection of the way things really are..... | N R S O A |
| 61. Even small events can bring on catastrophic consequences..... | N R S O A |
| 62. When I compare myself to others, I come up short..... | N R S O A |
| 63. I put myself down..... | N R S O A |
| 64. There are a right way and a wrong way to do things..... | N R S O A |
| 65. I tend to dwell on things I do not like about myself..... | N R S O A |

- 66. I go with my gut feeling when deciding something..... N R S O A
- 67. If people ignore me, I think they have negative thoughts about me..... N R S O A
- 68. I underestimate the seriousness of situations..... N R S O A
- 69. I blow things out of proportion..... N R S O A

Appendix D

Inventory of Cognitive Distortions Definitions of Terms

Inventory of Cognitive Distortions: 11 theoretical factors or cognitive distortions, as defined verbatim by (Yurica, 2002):

- 1) Externalization of Self-Worth: Refers to the development and maintenance of self-worth based almost exclusively on how the external world views oneself (Freeman & DeWolf, 1992; Freeman & Oster, 1999).
- 2) Fortune-Telling: The process of foretelling or predicting a future event or events and believing that this prediction is absolutely true for oneself (Burns & Seligman, 1989; Burns, 1999).
- 3) Magnification: The tendency to exaggerate or magnify either the positive or negative consequences of some personal trait, event, or circumstance (Burns & Seligman, 1989; Burns, 1999).
- 4) Labeling: The cognitive process of labeling oneself using derogatory names (Burns & Seligman, 1989; Burns, 1999).
- 5) Perfectionism: Refers to a constant striving to live up to some internal or external representation of perfection without examining the evidence for the reasonableness of these perfect standards, often to avoid the subjective experience of failure.
- 6) Comparison to Others: The tendency to compare oneself to others whereby the outcome typically results in concluding that oneself is inferior or worse off than others.

- 7) Emotional Reasoning: Refers to the predominant use of an emotional state to form conclusions about oneself, others, or situations (Beck et al., 1979; Burns & Seligman, 1989; Burns, 1999).
- 8) Arbitrary Inference/Jumping to Conclusions: Refers to the process of drawing a negative conclusion in the absence of specific evidence to support that conclusion (Beck et al., 1979; Burns & Seligman, 1989; Burns, 1999).
- 9) Minimization: Refers to the process of minimizing or discounting the importance of some event, trait, or circumstance (Burns & Seligman, 1989; Burns, 1999).
- 10) Mind-Reading: Refers to one's arbitrary conclusion that someone is reacting negatively, or thinking negatively towards him or her, without specific evidence to support that conclusion (Burns & Seligman, 1989; Burns, 1999).
- 11) Emotional Reasoning and Decision-Making: The tendency to rely on emotions to make decisions (Yurica, 2002).

Appendix E

Millon Behavioral Medicine Diagnostic Definitions of Terms

Millon Behavioral Medicine Diagnostic Domains and Scales comprised of the following, as defined by Millon et al. (2001):

Response Patterns: helps gauge distorted response tendencies in the self-report.

- 1) Disclosure: designed to determine whether the patient is inclined to be overly frank and self-revealing. Sample item, “I protect myself by not letting people know much about my life.”
- 2) Desirability: identifies the degree to which results may have been affected by the desire to appear socially attractive, morally virtuous, or emotionally well-composed. Sample item, “I have always had a talent for being successful.”
- 3) Debasement: assesses tendency to present many minor and major symptoms, sensations, and experiences when communicating with healthcare providers. In general, this scale is the opposite of the Desirability scale. Sample item, “I sometimes exaggerate how poorly I am feeling.”

Negative Health Habits: identifies lifestyle behaviors that may exacerbate medical problems or undermine efforts to treat illness.

- 4) Alcohol: Notes the presence of an alcohol consumption problem. Sample item, “It is difficult for me to get through my day without a few drinks.”
- 5) Drug: Associated with greater use of non-prescription drugs and a greater likelihood that the patient has developed a dependency on one or more of these substances. Sample item, “Taking drugs has been a regular part of my social life.”

- 6) Eating: Assesses the presence of a relatively chronic overconsumption problem.
Sample item, "I always overeat when I'm depressed or under stress."
- 7) Caffeine: Reflects whether the patient's consumption of caffeine is excessive.
Sample item, "I feel very irritable if I haven't had a cup of coffee for a few hours."
- 8) Inactivity: Notes whether patient engages in physical exercise on a regular basis.
Sample item, "I rarely find time to exercise."
- 9) Smoking: Notes whether the patient smokes tobacco containing products on a regular basis. Sample item, "I've tried to quit smoking many times, but I always start again."

Psychiatric Indications: identifies psychiatric comorbidities that may affect health management or provide a reason for referral to a health or clinical psychologist

- 10) Anxiety-Tension: High levels of anxiety and tension are found to be related to incidence and severity of numerous disorders and diseases. High scorers on this scale may suffer from numerous somatic disorders, especially those associated with cardiovascular and digestive systems. Sample item, "I feel jumpy and under strain, but I don't know why."
- 11) Depression: Is often a consequence of patients' awareness of their increasing infirmity or imminent death. Depression is a major correlate of medical disorders. Sample item, "I've lost interest in things that I used to find pleasurable."
- 12) Cognitive Dysfunction: Assesses developmental deterioration and the destruction of brain structure. Sample item, "I often get confused about what is happening to me."

13) Emotional Liability: Often have clinical features akin to the symptoms of borderline personality disorder. These patterns are typified by dysregulation of their affect and instability in their moods, perhaps manifested in repetitive suicidal thoughts or self-mutilation. Sample item, “My feelings toward my relative often swing back and forth from love to hate.”

14) Guardedness: Identifies medical patients who display mistrust and an edgy defensiveness against those they see as hostile and deceptive. Sample item, “No one needs to know my business.”

Coping Styles: assesses characteristics that reflect the cognitive, behavioral, and interpersonal strategies used to handle everyday problems, as well as their medical conditions and life stressors. All specifically relate to interactions with healthcare personnel.

15) Introversive: These patients seem to be unconcerned about their problems, emotionally subdued, quiet, and untalkative. Typically, they lack energy, are communicatively vague, are difficult to pin down concerning their symptoms, and may be passive with regard to taking care of their physical needs. Sample item, “My emotions don’t seem to be as strong as other people’s.”

16) Inhibited: There is a tendency to be hesitant with others and are often shy and ill-at-ease. Sample item, “I guess I’ve always been a fearful and inhibited person.”

17) Dejected: High scorers on this scale are inclined to be persistently and characteristically disheartened, unable to experience the pleasures of joys of life. Sample item, “I spend much of my time brooding about things.”

- 18) Cooperative: High scorers on this scale tend to be eager to attach themselves to a supportive healthcare professional and will follow medical advice closely. Sample item, “I almost always put other people’s needs above my own.”
- 19) Sociable: High scorers on this scale tend to be outgoing, talkative, and charming; however, they may be changeable in their likes and dislikes. Sample item, “I seem to fit in right away with any group of people I meet.”
- 20) Confident: High scorers on this scale are self-assured and confident. However, they are easily upset by physical ailments and will be motivated to follow treatment regimens that they believe will ensure their well-being. Sample item, “Everything I try comes easy to me.”
- 21) Nonconforming: High scorers on this scale tend to be somewhat unconventional if not arbitrary and occasionally inconsiderate in their manner. Sample item, “it’s all right to bend the law as long as you don’t break it.”
- 22) Forceful: High scorers on this scale tend to be rather domineering and tough-minded. A straightforward approach is most effective with these patients. Sample item, “I can get nasty with people who deserve it.”
- 23) Respectful: High scorers on this scale are likely to be responsible, conforming, and cooperative. They keep their feelings to themselves and try to appear controlled, diligent, and serious minded. Sample item, “I like to follow instructions and do what others expect of me.”
- 24) Oppositional: High scorers on this scale are very different from individuals who score high on the Respectful clinical scale. They are often unpredictable and

difficult. They may be erratic in following a treatment plan. Sample item, “I often resent doing things that others expect of me.”

- 25) Denigrated: High scorers on this scale habitually focus on the most troublesome aspects of their lives, behaving as if they deserve to suffer. Sample item, “I deserve many of the misfortunes I’ve suffered.”

Stress Moderators: identifies attitudes and resources that are psychosocial modulators of disease condition and progression. This domain is supported by evidence of factors that may exacerbate or weaken the biologic status and course of various medical disorders.

- 26) Illness Apprehension vs. Illness Acceptance: Reflects focus on and awareness of changes in their bodies such as tension/relaxation and arousal/fatigue. Sample item, “My body is constantly giving me worrisome signals.”

- 27) Functional Deficits vs. Functional Competence: Assesses the degree to which patients perceive that they are unable to carry out the vocational and avocational activities, roles, and responsibilities of daily life. Sample item, “My medical condition has made daily tasks much more difficult.”

- 28) Pain Sensitivity vs. Pain Tolerance: This scale addresses the tendency to be overly sensitive and reactive to mild to moderate pain. It assesses the degree to which pain is likely to dominate the clinical picture and potentially affect adjustment and recovery following treatment. Sample item, “Physical pain is a big part of my life.”

- 29) Social Isolation vs. Social Support: This scale assesses patient’s perception of the social support in their lives. High scorers are more likely to suffer physical and

psychological ailments than low scorers. Sample item, “There’s little emotional support within my family.”

30) Future Pessimism vs. Future Optimism: This scale is designed to assess patients’ outlook toward their future health status. A high score on this scale may reflect a patient’s response to his/her current medical problems rather than a lifelong tendency to be pessimistic (as assessed by the Depression and Dejected scales).

Sample item, “My future looks like it will be full of problems and pain.”

31) Spiritual Absence vs. Spiritual Faith: This scale assesses the degree to which patients lack religious or spiritual resources for dealing with the stressors, fears, and uncertainties of their medical condition. Sample item, “I am not a very spiritual person.”

Treatment Prognostics: Identifies behaviors and attitudes that may complicate or enhance treatment efficacy.

32) Interventional Fragility vs. Interventional Resilience: This scale predicts whether patients will be able to adjust emotionally to the demands of physically and psychologically stressful medical protocols and also forecasts the route of decompensation that they are likely to present if they become overwhelmed by these stressors. Sample item, “I’ve had nightmares about medical procedures I may have to endure.”

33) Medication Abuse vs. Medication Conscientiousness: This scale predicts the likelihood that patients will have problems with or will misuse prescribed medication. This might take the form of changing dosages, combining

medications inappropriately, or using outdated prescriptions. Sample item, “If I don’t get relief from medicine, I may increase the dosage on my own.”

34) Information Discomfort vs. Information Receptivity: This scale assesses patients’ lack of receptivity to specific details about diagnostic, prognostic, and treatment procedures and outcomes. True response sample item, “I’d rather not know the details of an illness I might have.”

35) Utilization Excess vs. Appropriate Utilization: This scale assesses the likelihood that patients will use medical services more than the average patient with a similar medical condition. Sample item, “I feel entitled to all my sick days each year.”

36) Problematic Compliance vs. Optimal Compliance: This scale identifies the disinclination to follow home-care advice, to adhere to nutritional instructions, and to keep and be on time for appointments. False response sample item, “I make sure that I’m on time for all my doctor’s appointments.”

Management Guides: integrates and summarizes major problem areas:

37) Adjustment Difficulties: This scale assesses the risk of treatment complications due to the patient’s coping style, the current psychological issues operating in the patient’s life, his/her available resources for managing stress and his/her risk of engaging in unhealthy behavior. Sample item, “I think things will get much worse in the coming months.”

38) Psychiatric Referral: This scale indicates whether the patient might benefit from psychosocial intervention and the likelihood that he/she would respond well to a specific type and form of intervention. Sample item, “I start to feel crazy when medical problems turn out badly for me.”

Appendix F

Millon Behavioral Medicine Diagnostic Domains and Scales

Response Patterns		Number of Items
X	Disclosure	6
Y	Desirability	11
Z	Debasement	10
Negative Health Habits		
N	Alcohol	2
O	Drug	2
P	Eating	3
O	Caffeine	2
R	Inactivity	3
S	Smoking	3
Psychiatric Indications		
AA	Anxiety-Tension	15
BB	Depression	23
CC	Cognitive Dysfunction	14
DD	Emotional Liability	18
EE	Guardedness	20
Coping Styles		
1	Introversive	15
2A	Inhibited	17
2B	Dejected	13
3	Cooperative	15
4	Sociable	9
5	Confident	12
6A	Nonconforming	14
6B	Forceful	12
7	Respectful	17
8A	Oppositional	22
8B	Denigrated	17
Stress Moderators		
A	Illness Apprehension vs. Illness Acceptance	21
B	Functional Deficits vs. Functional Competence	16
C	Pain Sensitivity vs. Pain Tolerance	22

D	Social Isolation vs. Social Support	20
E	Future Pessimism vs. Future Optimism	16
F	Spiritual Absence vs. Spiritual Faith	7

Treatment Prognostics

G	Interventional Fragility vs. Interventional Resilience	17
H	Medication Abuse vs. Medication Conscientiousness	10
I	Information Discomfort vs. Information Receptivity	6
J	Utilization Excess vs. Appropriate Utilization	17
K	Problematic Compliance vs. Optimal Compliance	16

Management Guides

L	Adjustment Difficulties	15
M	Psychiatric Referral	14