2007

# Relationship Between Cognitive Distortions and Psychological and Behavioral Factors in a Family Medicine Outpatient Sample

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THE RELATIONSHIP BETWEEN COGNITIVE DISTORTIONS

AND PSYCHOLOGICAL AND BEHAVIORAL FACTORS

IN A FAMILY MEDICINE OUTPATIENT SAMPLE

By Jeffrey K. Uhl

Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Psychology

February 2007

## PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE
## DEPARTMENT OF PSYCHOLOGY

### Dissertation Approval

This is to certify that the thesis presented to us by Jeffrey K. Uhl on the 13th day of

December, 2006, 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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Dedication Acknowledgement

A dissertation is one of those projects in life, the completion of which many people contribute, but one person seems to get all the credit. Upon reflection, my family and "academic, professional, and dissertation family" of supporters and mentors are a group of people whom I have come to love or love and appreciate more deeply. These are people who have selflessly given of themselves so that I may achieve my goal of having a career in psychology.

I first thank Michele, my wife and friend, for her patience, counsel, and encouragement during the five-plus years that I have worked on completing my doctorate. Ours has truly been a partnership as we raise two beautiful children with great hope, love, and optimism for their future. Over the last 5 years, we have loved, cried, laughed, despaired and celebrated. *I thank you for the gift of our family and the gift of you. I love you.*

I thank my son Michael and daughter Rebecca for bringing moments of great joy when I needed it most. They are what make it all worthwhile as I watch each of them become the unique people they are meant to be. They make me proud every day of my life.

I thank my mother and father, who did the best they could with what they had at the time and for never giving up on me. Their unconditional love, faith, and support during my early years provided me with a belief in myself that has served me well. *Thank you.*

Sincere thanks to Dr. Robert DiTomasso, Committee Chairperson, for providing me with his support and mentorship through the entire doctoral process. His good nature, patience, and professionalism have helped me to develop into a clinician with reverence and a deep sense responsibility for what we do.

Equal gratitude is extended to my committee members: Dr. Stuart Kurlansik, for his guidance and support during the dissertation process and internship year. When I needed it most, which seemed to be often, I especially appreciated his great sense of humor. He generously made himself available to ease my fears and regularly gave up his personal time to provide supervision. I would also like to thank Dr. Barbara Golden for her support and guidance not only as a committee member but also as my academic advisor. Her compassion and support over the years was greatly appreciated.

Gratitude is also extended to the Virtua Health and their medical director, Dr. Mary Willard for opening her two family practice centers to me and allowing me to collect data. Throughout my time at Virtua, Mary has opened countless doors for me and I can only hope that I have been half the friend she has been to me. My life has been forever changed because of her. *Thank you.*

Special thanks to all who volunteered to participate in this study. Without you, this knowledge would not exist.

I also wish to thank my friends and colleagues, Elisabeth Bond, Dena Young, Meredith Mitstifer, Dave Baker, Charles Goins, Andrea Bloomgarden and Taka Suzuki. They have provided support, friendship, laughter, and professional guidance throughout my doctoral experience.

Abstract

The purpose of this study was 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, coping styles, stress moderators, treatment prognostics, and management guide. The sample was selected from a heterogeneous adult family practice outpatient population. Participants meeting inclusion criteria presented for medical treatment or routine physical examinations. Results supported the reliability and validity of the ICD as an instrument measuring cognitive distortions. Cronbach's Alpha for the Total ICD scale was .97, indicating excellent internal consistency and homogeneity of item content. The ICD proved to be an excellent measure for uncovering relationships between distorted thinking and psychological and behavioral health risks as measured by the MBMD. Of the 34 hypotheses in this study, 29 hypotheses demonstrated significant positive findings. Suggestions for future research and implication of the work are discussed.

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## Introduction and Literature Review

### *Statement of the Problem*

Cognitive theory and research has indicated that cognitive distortions in patients contribute to psychological and behavioral disorders (Beck et al., 2004; Millon & Davis, 1996), and these same patients often present in medical settings with physical complaints. The complaints that patients bring to their primary care physicians are generally not symptoms of biological diseases (Kroenke & Manglesdorff, 1989). The 10 most common complaints are headache, dizziness, fatigue, chest pain, edema, back pain, shortness of breath, insomnia, numbness, and abdominal pain (Blount, 2003). Biological causes for these symptoms are found only 25% of the time. Other researchers have hypothesized that the remaining 75% of patients struggle to find relief for their symptoms in the medical model, which is traditionally not very responsive to a patient's behavioral health needs. (Addington, J., Van Mastrigt, Hutchinson, & Addington, D., 2002).

### *Limited Research*

An extensive literature review revealed no research addressing the frequency of cognitive distortions in a heterogeneous adult medical outpatient sample meeting criteria for a wide range of psychological and behavioral problems. Most studies were limited to the examination of diagnoses such as depression or anxiety with the possibility of co morbid personality disorders (e.g., Ilardi & Craighead, 1999). No studies were found assessing the relative contribution of the frequency of cognitive distortions to factors that

influence the course of treatment of medically ill adult patients.  A recent study, which focused on psychological disorders across diagnostic axes, found cognitive distortions correlated with the number and severity of psychological disorders across diagnostic axes (Rosenfield, 2004).   This study used the Inventory of Cognitive Distortions (ICD) to examine the relationship between cognitive distortions and clinical diagnoses as determined by the Millon Clinical Multiaxial Inventory-III.

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 potentially exacerbate a medical condition would be useful both to psychologists and to medical doctors.  In some cases, these underlying psychological conditions may be the root cause of a medical condition.

Treatment of cognitive distortions is highly successful with pointed therapies such as Cognitive-Behavioral Therapy (CBT), but if left untreated, cognitive distortions can leave even the most experienced medical doctor befuddled. This, in turn, may result in more doctor visits, higher heath care costs, and continued suffering for the patient (i.e. feeling poorly; side effects of medications prescribed to treat symptoms).

*The Purpose of the Study*

The purpose of this study was twofold: 1) to  determine the relationship between the frequency of cognitive distortions, as measured by Yurica and DiTomasso's ICD (Yurica 2002, see Appendix A), and psychological and behavioral factors, as measured by the Millon Behavioral Medicine Diagnostic (MBMD) (Millon, 2001, see Appendix B), which include negative health habits (Lifestyle behaviors exhibited by patients that

may exacerbate their medical problems or undermine efforts to treat their illnesses.), psychiatric indications (reasons for referral to a health or clinical psychologist), coping styles (reflecting the cognitive, behavioral, and interpersonal strategies patients use to acquire reinforcers and to avoid pain and discomfort in medical settings and in other spheres of their lives), stress moderators (psychosocial modulators of disease condition and progression), treatment prognostics (identifying behavioral and attitudinal aspects of a patient's life that may complicate or enhance treatment efficacy), and management guide (These scales integrate and summarize a patient's major problem areas.); 2) to investigate further the psychometric properties of the ICD in a primary care population.. Operational definitions of the factors have been explained later in the literature review. A list of definition of terms for the MBMD can be found in Appendix G.

The value of doing this research is found in early detection of maladaptive ways of thinking and by thus providing, therapist, physician and patient, the opportunity to understand how cognitive distortions may be impacting their patients' conditions. It has been demonstrated that treatment occurring earlier in the course of psychological disorders correlates with a number of therapeutic benefits, including fewer office visits to physicians, positive treatment outcome, and reduced health care costs (Kaplan, 2000). In a primary care setting, the ICD may be a useful diagnostic instrument that would provide an early warning indicator for preventive psychotherapy.

*Rationale for the Study*

The clinical value of correlating cognitive distortions with psychological and behavioral factors is that it may determine the psychological and behavioral factors that have a correlational relationship with cognitive distortions in medically ill adult patients.

It has been hypothesized that the reason such measures as the Health Belief Model (HBM) (Rosenstock, 1966) have limited predictive value is the assumption that health-relevant information is evaluated and acted on in a rational manner (Janis, 1984). For example, when an individual is predisposed to appraising a situation in a distorted manner, conventional health beliefs are unlikely to predict health behavior or preventative-health behavior. Descriptive reports made by Meichenbaum and Turk (1987) are consistent with the view that some patients hold irrational beliefs that may undermine adherence. Current research suggests that distorted thinking and appraisals may result in increased behavioral disability or dysfunction among physically ill and depressed individuals (Flor & Turk, 1988; Smith, Peck, Milano, & Ward, 1988). To date, no research has been conducted on the use of cognitive distortions by patients in the family practice setting as they relate to psychological and behavioral factors.

The ICD may also provide both medical and mental health clinicians with an effective tool that supports the biopsychosocial model of patient care. For the medical clinician, a patient's presenting problems are better understood in terms of the confounding role that cognitive distortions may be playing in negative treatment outcomes. This deeper level of understanding may promote the more timely referral to a mental health clinician. It may also provide mental health clinicians with psycho-educational data that can be used to help the patients understand the effect their cognitions have on their medical conditions. A collaborative remedial plan may then be developed to help the patients acquire the cognitive and behavioral skills needed to address their particular patterns of cognitive distortions (Beck & Freeman, 1990).

Aaron Beck's (1976) research and cognitive model predict a positive correlation between cognitive distortions and pathology associated with psychological and behavioral factors. This theory is the foundation of cognitive therapy because emotion and behavior are heavily influenced by cognition (e.g., Beck, 1976). The effect of distorted cognitions results in negative emotions and ineffective and maladaptive behaviors. This study was closely modeled after this theory because the ICD measured patients' cognitive distortions and the MBMD measures their negative emotions and ineffective and maladaptive behaviors.

Value was also found in further assessing the psychometric properties of the ICD. Yurica and DiTomasso(Yurica, 2002) developed the ICD as a psychometric self-report instrument for measuring cognitive distortions in an adult clinical population. The ICD is designed to measure distorted cognitions in an outpatient clinical population and normal controls, using a 69-item self-report inventory. The instrument consists of single sentence items answered on a five-point Likert scale (Likert, 1932). The ICD provides a total score reflecting the total frequency of cognitive distortion along with scores on 11 factors/cognitive distortions. The range of the total score is from 69 to 345. The ICD contains 11 cognitive distortion subscales: (1) Externalization of Self-Worth; (2) Fortune-Telling; (3) Magnification; (4) Labeling; (5) Perfectionism; (6) Comparison to Others; (7) Emotional Reasoning; (8) Arbitrary Inference/Jumping to Conclusion; (9) Minimization; (10) Mind-Reading; (11) Emotional Reasoning and Decision-Making (Yurica, 2002). Initial validation results of this psychometric test are promising. Levels of internal consistency were demonstrated by a total scale Coefficient Alpha of .98 and test-retest reliability was stable     (r = .98) (Yurica, 2002).

*Literature Review of Related Research*

In this section the literature on health practices and cognitive models are reviewed and synthesized. It becomes clear how research in this area may hold the key to providing psychologists and physicians an effective tool that will make collaborative care much more efficient. This research is firmly based in the biopsychosocial model of patient care.

*Health Practices and Medical Regimen Adherence*

Over the past three decades, health-related behavior and the cognitive factors that influence that behavior have been the focus of health-behavior theory research. No model has been as influential in advancing our understanding of health behavior as the Health Belief Model (HBM) (Rosenstock, 1966). According to the HBM, when an individual perceives that there is a high probability of injury or eminent physical threat and when the perceived health benefits of a behavior outweigh any barriers, an individual will engage in the positive health-related behavior. In more recent research, to the surprise of many, the HBM has proven to be of only modest predictive value for health behavior and other studies have found no predictive association with preventative-health behavior (Janz & Becker, 1984; Bond, Aiken, & Sommerville, 1992). An example of health behavior would be the decision not to smoke or the decision to take medication as directed, and an example of preventative-health behavior would be the decision to run three miles four times per week or the decision to eat only healthy foods. The reason that the HBM has limited predictive value is its assumption that health-relevant information is evaluated and acted on in a rational manner (Janis, 1984).

Conversely, Weinstein (1982, 1983, and 1984) has found an optimistic and pervasive bias in individuals' health risk judgments. There seems to be a tendency for people to believe that they are less susceptible to the risk of developing an illness than those around them. It seems that little research has been done in examining the behavioral implications of individual differences in susceptibility judgments. It has been hypothesized by Millon et al. (2001) that this optimistic bias may also result in poor treatment compliance. People may discontinue treatment as soon as they feel better. This black or white thinking, "I am sick when I feel sick and I am not sick when I do not feel sick", could in some cases be very dangerous when it affects decisions around medical compliance. Currently there are no psychometric measures available to assess differences in the tendency to appraise health-related situations or experiences in biased or distorted manners. This issue represents an important area of concern for a number of reasons. First, thinking processes affect emotion and behavior and as such are likely to influence physical health practices. Second, it seems reasonable to assume that consistent and frequent distorted thinking may have an adverse impact on health and health practices. Third, discovering relationships between cognitive distortions and negative health practices may provide important inroads to understanding how information processing patterns may be altered to promote more effective interventions in behavioral medicine contexts. It is also clear that there is a need for integration of psychological and medical expertise. Current medical facilities, at best, tend to collaborate with psychologists because they operate under the same roof. The current trend in psychology and medical training programs is showing promise for the realization of truly integrated services. Empirical research on the integration of services is a recent but growing trend

(Belar & Deardorf, 1995). Managed care companies have been particularly interested in the efficiencies it creates, particularly in relation to important issues such as over utilization of medical services.

*Confounding Problems for Physicians*

Confounding problems facing primary care physicians that add to over-utilization problems are poor patient mental health literacy and a negative stigma attached to the utilization of mental health services. Both originate from a patient's perspective and are significant hurdles that the primary care physician must face in convincing the patient to obtain mental health services. Bias toward physical disease by the physician is apparent, but the patient possesses a more subtle bias. The patient tends to present with physical symptoms, as opposed to psychological ones (Jorm, 2000). This mode of interacting with the physician confounds the physician's efforts in the detection of mental health related disorders (Jorm, 2000), and conversely, the detection of mental disorders improves if the patient acknowledges that symptoms reflect a mental health problem (Herran, Vazquez-Barquero, and Dunn, 1999). Herran et al. conclude that the top-down approach of promoting mental health through the communication of evidence-based research results may not be effective in improving mental health literacy.

Mental health illiteracy may be further compounded by a cultural bias against such services. Research has shown that Latinos are culturally reluctant to engage mental health services and are more likely to turn to their religion or to family members for support (Kouyoumdjian, Zamboanga, and Hansen, 2003). Religion and family support are often insufficient care, thereby causing symptoms to persist or become worse. In addition, efforts toward improving literacy are often stymied by varying degrees of

acculturation, which can make it difficult to develop effective psychoeducational programs. Large, varying degrees of acculturation can exist not only within a single community but also within a family.  In the following section the tenets of the cognitive model are reviewed.

*Overview of Cognitive Therapy*

Cognitive therapy came to prominence in the late 1960s and early 1970s in response to inadequacies in the behavioral and psychodynamic approaches that dominated psychotherapy at the time (Dobson & Dozois, 2001).  The mechanistic focus of the behavioral model failed to account for the multiplicity of forces that guide human behavior.  Although behavior therapists could successfully produce therapeutic change by focusing on disorders characterized by maladaptive behavior or by targeting behavioral symptoms, many therapists were aware that they offered only partial solutions to complex psychological problems.  In contrast, psychodynamic therapists viewed therapeutic change as an exceedingly complex process, emphasizing unconscious mechanisms, early experiences, and a long-term therapeutic relationship.  However, a growing number of critics noted that there was negligible evidence to support the effectiveness of traditional psychodynamic therapy.

Cognitive-behavior therapy (CBT) is founded on three basic propositions (Dobson & Dozois, 2001).  The first proposition is that cognitions influence behavior. This assumption emanates from the philosophy of the Greek Stoics, who believed that one's subjective perception of events, rather than events themselves, primarily determined the behavioral response (Beck & Weishaar, 1989; Dryden & Ellis, 2001). The second proposition is that cognitive processes are amenable to observation and

change (Dobson & Dozois, 2001). The third proposition is directly related to the first: by altering cognitions one can achieve desired behavior change.

*Beck's Cognitive Model.*

Two of the foremost theorists in CBT are Beck (1979, 1993; Beck, Rush, Shaw, & Emery, 1979; Beck & Weishaar, 1989; DeRubeis, Tang, & Beck, 2001) and Bandura (1977, 1986, 1997); they emerged into this field from studies in classic psychoanalysis and radical behaviorism. Beck began as a classic Freudian, ultimately concluding from studies of depressed patients that Freud's theory of "melancholia" as inward-directed anger was flawed (Beck & Weishaar, 1989; DeRubeis et al., 2001). Departing from psychoanalytic thinking, Beck focused on the negative biases and distortions that were common to the cognitive processes of depressed patients. Based on his observations, Beck identified the cognitive triad: negative view of the self, current experience, and the future (Beck, 1976; Beck et al., 1979). Once set into motion, cognitive biases reinforce perceptions of low self-worth, helplessness to change unfavorable 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 ranging in scope from adult depression to trauma-focused CBT for sexually abused children (Cohen, Deblinger, & Mannarino, 2004).

Three key mechanisms for inducing change in cognitive therapy are collaborative empiricism, Socratic dialogue, and guided discovery (Beck, 1976; Beck & Weishaar, 1989). In collaborative empiricism, client and therapist conjointly determine treatment goals, which may change over the course of therapy, and they mutually solicit and offer feedback. Through Socratic dialogue, the therapist creates a set of questions to promote

new learning consistent with the therapeutic emphasis on goal clarity, cognitive processes, and understanding of the mechanisms underlying maladaptive beliefs.  In guided discovery, the therapist acts as a facilitator of change, directing the process of altering distorted beliefs and assumptions.

Beck (1976) recognized essential similarities between cognitive therapy and behavior therapy.  Both modalities are more structured than other therapeutic formats and the therapist assumes a more active role.  Following a detailed diagnostic interview, the therapist formulates the client's presenting problem according to cognitive or behavioral terms and devises a system of strategies targeting the client's specific problem areas.  The therapeutic process is strategic and goal-focused, with the therapist acting as coach, guide, and facilitator to induce the desire responses and behaviors.

A second commonality is that both cognitive and behavior therapy act directly on the symptoms that cause distress (Beck, 1976).  A third common point is that there is much less emphasis than there is in psychodynamic therapies on relating current problems to issues of early childhood development and family dynamics.  Both cognitive and behavior therapy emphasize the "here-and-now" as opposed to the past (Beck, 1976, p. 321).  Beck also noted distinctions between the cognitive and behavioral approaches. However, most current interventions fall into the category of "cognitive-behavior therapy," a term that encompasses more than 20 different therapeutic approaches derived from the cognitive model (Young, 2002).  Beck (1993) acknowledged that the behavioral component of CBT has expanded to occupy a significant part of therapeutic interventions.

*Strategies and Cognitive Change.*

Interestingly, Bandura is sometimes regarded as a cognitive therapist (Lev & Owen, 2000). However, he was originally influenced by radical behaviorism to which he added such concepts as modeling (Bandura, 1977, 1986). By acknowledging the role of cognitive processes in behavior rather than focusing on external stimuli and rewards, Bandura essentially humanized behaviorism. Self-efficacy theory, which has become a cornerstone of health psychology, is based on the recognition that human beings have an intrinsic need to feel competent in order to attain their desired goals (Bandura, 1997). Bandura (1977) initially used the term "social learning theory" to distinguish his concept of learning from the stimulus-response orientation of radical behaviorism. He eventually relabeled the model "social cognitive theory," a term that more effectively captures the sophisticated processes that motivate human behavior (Bandura, 1986).

The social cognitive concepts of modeling and self-efficacy generally form the foundation for the cognitive component of CBT (Bandura, 1986). In modeling, the therapist models a desired behavior or technique that the client subsequently enacts (behavior rehearsal). Behavioral techniques promote the development of self-efficacy, which reinforces the ability of cognitive strategies to produce enduring change (Bandura, 1997; Lev & Owen, 2000). The sense of control derived from perceived self-efficacy is particularly important for individuals managing chronic health conditions. For example, self-efficacy is a key predictor of dietary adherence in individuals with diabetes, complementing the role of autonomous self-regulation (Senecal, Nouwen, & White, 2000). Control is a prominent theme in the narratives of cancer patients; perceived control eases psychological and physical distress and moderates the detrimental effects of

stress (Lev & Owen, 2000).  Outcome expectancy, also derived from social cognitive

theory, has been found to predict client responses to a specific intervention

(Kwekkeboom, 2001).  Both cognitive and behavioral strategies can be used to enhance

outcome expectancy.

Cognitive-behavioral therapies fall into three predominant classifications

depending on whether or not the emphasis is on coping skills, problem-solving strategies,

or cognitive restructuring (Dobson & Dozois, 2001).  The distinction lies in the extent to

which the focus is on achieving cognitive change versus behavioral change.  A major

strength of CBT is that the synthesis of cognitive and behavioral techniques forms a

package that can be tailored to the needs of a specific problem area or to a population

group such as children or adolescents.  As examples, interventions for clients with serious

illness (or their caregivers) emphasize coping skills; problem-solving strategies are

essential to substance abuse prevention and intervention and cognitive restructuring is a

core element of CBT for depression.

Eversole (1997) used the term "bending the frame" to denote a therapeutic

framework in which the therapist extends conventional boundaries by utilizing a

repertoire of skills and strategies to fit specific client needs.  Originally applied to the

biopsychosocial needs of clients with HIV/AIDS, a "bent frame" approach is intended to

promote the empowerment of clients as successful consumers of mental health services.

Although bending the frame is applicable to all forms of therapy, it is particularly

congruent with multifaceted CBT interventions that draw on a variety of strategies and

techniques to alter distorted cognitions and facilitate behavioral change.

Since the inception of CBT in the mid-20th century, an overwhelming body of empirical evidence has accumulated to support its effectiveness (Dobson & Dozois, 2001). The most extensive use of CBT has been in treating depression (Beck, 1993). In addition to treating depression, CBT also has empirical support for treating anxiety disorders, panic disorder and agoraphobia, social phobia, obsessive-compulsive disorder, eating disorders, and even psychoses and schizophrenia. Indeed, a more intense and complex formulation of CBT has shown promise with a variety of personality disorders (J. Beck, 1998). Schema-focused therapy is an extension of cognitive therapy uniquely developed to treat personality disorders (Young, 2002).

The list of clinical applications is continually expanding. An integral part of health psychology, the active, solution-focused, goal-directed approach of CBT is extremely well designed for facilitating medication adherence (Marcinko, 2003). Even more broadly, CBT is typically the model of choice for managing complex health conditions such as diabetes (Senecal et al., 2000). CBT has also proven effective for managing chronic pain (Eimer, 1989). Recent innovations include CBT interventions for patients with cancer (Kwekkeboom, 2001; Lev & Owen, 2000; Walker, 2004; Walker et al., 1999) and HIV/AIDS (Antoni et al., 1991; Church, 1998; Eversole, 1997).

*Conceptualizations of Cognitive Distortions*

Whether the focus is on the cognitive dimension or on the behavioral dimension, all therapeutic approaches operating under the cognitive-behavioral umbrella will share a common theoretical perspective. The underlying assumption is that "internal covert processes" labeled "thinking" or "cognition" takes place, and that cognitive activity may mediate behavior change (Dobson & Dozois, 2001, p. 6). A second assumption is that

behavioral change is not contingent on the activation of "elaborate cognitive mechanisms" (p. 6). Regardless of the specific approach, there is implicit recognition that distorted or maladaptive cognitions play a prominent role in the etiology and perpetuation of psychological distress. In fact, Prochaska and Prochaska (1999), who created the transtheoretical model of behavior change, identified maladaptive cognitions as a major cause of problem behaviors, but also one that is highly accessible. Many cognitive-behavioral therapists interpret behavior change as an indirect sign that cognitive change has occurred (Dobson & Dozois, 2001).

*Defining Cognitive Distortions.*

In his work with depressed patients, Beck observed that thought patterns were characterized by systematic inaccuracies in reasoning (Beck & Weishaar, 1989). From these persistent patterns, Beck discerned six types of cognitive distortions: 1) arbitrary inference (reaching a conclusion that has no logical validity); 2) selective abstraction (formulating an idea on the basis of a detail taken out of context, while ignoring other relevant information); 3) overgeneralization (deriving a general rule from isolated incidents and applying it to various other situations); 4) magnification and minimization (perceiving something to be much more, or much less, important than it is); 5) personalization (internalizing attribution for external events); and 6) dichotomous thinking (classifying experiences according to one or two extremes).

Burns (1999) expanded the list of cognitive distortions, phrasing them to make them more accessible to the layperson. Burns' Checklist of Cognitive Distortions includes: 1) all-or-nothing thinking; 2) overgeneralization; 3) mental filter (dwelling on negatives while ignoring positives); 4) discounting the positives; 5) jumping to

conclusions (including mind-reading, or assuming that all people view one negatively, and fortune-telling, or arbitrarily predicting negative outcomes); 6) magnification or minimization; 7) emotional reasoning, 8) "should statements"; 9) labeling (identifying with one's flaws); and 10) personalization and blame.

Certain cognitive distortions are specific to diagnosed psychological disorders. Detailing how cognitive therapy (CT) can be adapted to treat the complex needs of clients with Axis II disorders, Judith Beck (1998) outlined a core set of distorted beliefs that underlies each personality disorder. Although they appear to parallel the cognitive distortions that fuel Axis I disorders, distorted beliefs are much more deeply embedded in the mental processes of individuals with personality disorders.

Self-blame is a common cognitive distortion in victims of interpersonal trauma (Janoff-Bulman, 1992). Although it may be construed as a manifestation of personalization, self-blame resulting from victimization is most effectively addressed within a trauma-focused framework (Cohen et al., 2004; Gill & O'Carroll, 2004).

*Cognitive Models and Cognitive Distortions*

*Schemas and Cognitive Distortions.*

In Beck's model, cognitive distortions result from a reversion to a "primitive information-processing system" activated through the "interaction of personal and environmental factors" (Beck & Weishaar, 1989, p. 24). The process is unique to each individual; each person has certain individual characteristics that regulate vulnerability to psychological distress. The factors that influence vulnerability include personality structure, and one's basic beliefs about the self and the world. These basic cognitive structures or schemata develop in early childhood as a result of one's personal experience

and interactions with significant others.  As the person develops, additional learning

experiences build on early formulations, reinforcing a dynamic process that affects the

development of additional beliefs, values, and attitudes.  Beck's model is congruent with

Erikson's (1950) model of psychosocial development.  One may argue that these schemas

influence the way individuals navigate the stages of life span development.

According to the cognitive model, schemas may be positive and adaptive or they

may be negative and dysfunctional (Beck & Weishaar, 1989).  Additionally, schemas

may be general or specific.  Competing schemas may also exist simultaneously.  The

model postulates that schemas are typically dormant but spring into play when activated

by stimuli.  Young (2002) views schemas as a "template for processing experience" that

gains in complexity over time, demarcating the person's behaviors, thoughts, feelings,

and interpersonal relationships (p. 205).

Building on Beck's model, Young (2002) defines schemas as "implicit,

unconditional motifs held by individuals" (p. 205).  The rigidity in the term

"unconditional" implies that schemas are inherently dysfunctional.  Whereas underlying

assumptions are amenable to change, schemas are far more deeply ingrained.

Young (2002) developed schema-focused therapy for the specific treatment of

individuals with personality disorders.  The distinction Young makes between underlying

assumptions and schema is consistent with Judith Beck's (1998) differentiation between

working with clients with Axis I disorders and Axis II disorders.  According to J. Beck

(1998), clients presenting with anxiety or depressive disorders who have an essentially

healthy personality structure are capable of exhibiting adaptive, reality-based, functional

beliefs about the self, others, and their places in the world.  Equipped with a repertoire of

behavioral strategies, they have the capacity to make realistic appraisals and choose appropriate strategies. Indeed, successfully treated clients may view the world through an adaptive optimistic bias. Although their distress is caused by irrational cognitions, most Axis I clients do not have enduring problems after their symptoms are alleviated.

Conversely, individuals with personality disorders display dysfunctional beliefs, maladaptive behavioral strategies, and impaired cognitive processing even in the absence of an Axis I disorder (J. Beck, 1998). Virtually all information is processed within the context of negative beliefs. Clients with personality disorders have a limited behavioral repertoire that serves the needs of their core beliefs. For example, core beliefs of individuals with paranoid personality disorder determine that they are vulnerable and that other people are malicious. From this perspective their safety is guaranteed only if they remain hyper vigilant and perennially suspicious of others. Young (2002) proposed three automatic schema processes that are reflected in J. Beck's (1998) cognitive model of personality disorders. These are maintenance, avoidance, and compensation (Young, 2002). Schemas represent the most deeply entrenched level of cognitive processes, thus the resulting cognitive distortions are less accessible than those resulting from flawed or irrational assumptions.

*Cognitive Content and Processes.*

Kendall's (1992) cognitive processing taxonomy comprises four key elements: 1) cognitive content, 2) cognitive processes, 3) cognitive products, and 4) cognitive structures. Cognitive content refers to thoughts, beliefs, and images stored and organized in memory (Kendall, 1992). Self-referent speech is derived from cognitive content. Cognitive processing encompasses the mechanisms for attending to, encoding, and

retrieving information.  Cognitive structures are mental templates that direct one's focus to, or filter out specific stimuli.  Cognitive products are the thoughts, assumptions, and beliefs that may be either adaptive or maladaptive, depending on the interaction of cognitive content, processes, and structures.

*Cognitive Processes and Cognitive Science.*

A recent development in the evolution of cognitive therapy is a call for integrating neuroscience and CBT (Ingram & Siegle, 2001).  It is now recognized that neurobiological processes may play a role in the etiology of psychological disorders.  Ingram and Siegle (2001) propose that the development of methods for assessing brain correlates of cognitive processes may ultimately lead to the understanding of a biological basis for change in cognitive therapy.  Although work in this area of cognitive science is in a fledgling state, the authors suggest that theoretically, advances in neuroscience may enhance the practice of CBT.

A promising area for cognitive therapy involves neuroscience research into individual differences in emotional regulation (Ochsner & Gross, 2004).  In particular, research into the use of reappraisal may enhance understanding of how therapeutic interventions may be structured to enable individuals to experience more positive emotion and less negative emotion.  The ultimate goal of such research is to enable individuals to optimize the adaptive capacity of emotional regulation.

The tenets of cognitive therapy are incorporated into the neuropsychological model of affect regulation (Larsen & Prizmic, 2004).  Larsen and Prizmic note that of the myriad of definitions of affect regulation, most include the idea that in the process of monitoring and appraising affective states, individuals engage in actions either to sustain

or to alter the intensity of affect, or to lengthen or shorten the affective episode. The purpose of regulating affective states is clear: affective states impact behavior, experience, and cognition, particularly in the context of social interactions. Affect regulation is especially pertinent to the treatment of depression and anxiety. Studies of the neural correlates of emotion suggest that impairment of the ability to regulate the duration of negative affect and to suppress or inhibit it may be critical factors in the etiology of mood disorders. There is also substantial interest in exploring the physiological impact of affect suppression although the association between affect regulation and long-term health outcomes remains vague and subject to debate.

The value of altering cognitive distortions is reinforced by a body of research suggesting that the influence of negative life events on subjective feelings is far more powerful than that of positive life events (Larsen & Prizmic, 2004). However, some researchers have argued that deficits in positive cognitions may be a feature of psychological disorders with comparable importance to overly negative cognitions (Ingram, Kendall, Siegle, Guarino, & McLaughlin, 1994). Others propose that interaction between positive and negative cognitions may be a significant factor in psychological distress.

*Cognitive Processing and Cognitive Therapy.*

The way that CBT interventions address cognitive distortions may vary with the theoretical orientation, the presenting problem, and the individual preferences of the therapist and client (Dobson & Dozois, 2001). Cognitive techniques are designed to confront directly and to challenge the client's erroneous beliefs and maladaptive assumptions. The format consists of specialized learning experiences for teaching the

client: 1) to monitor negative, automatic thoughts; 2) to recognize linkages between cognition, affect, and behavior; 3) to examine evidence that both supports and refutes distorted automatic cognitions; 4) to substitute more reality-based interpretations for biased cognitions and 5) to learn to identify and change dysfunctional beliefs that predispose one to distort experiences (Beck et al., 1979).

The cognitive component is highly verbal (Beck et al., 1979). In fact, the collaborative nature of CT creates a strong therapeutic alliance (Beck & Weishaar, 1989; J. Beck, 1998). Client and therapist engage in ongoing dialogue about treatment issues and goals, which are subject to change over the course of treatment. The therapeutic process begins with an explanation of the logic underlying the cognitive approach (Beck et al., 1979; DeRubais et al., 2001). The client learns to recognize, monitor, and record distorted cognitions in the Daily Record of Dysfunctional Thoughts (DTR). A major strength of CBT is that the client assumes an active role in the cognitive as well as in the behavioral component of treatment. Self-monitoring, journal keeping, completing homework assignments, and providing the therapist with feedback are strategies that work to "demystify" psychotherapy, reinforce learning, and make the client understand that he or she is responsible for the outcome of therapy (Beck & Weishaar, 1989).

As previously stated, three essential mechanisms for producing change in CT are collaborative empiricism, Socratic dialogue, and guided discovery (Beck, 1976; Beck & Weishaar, 1989). Although Beck emphasizes the use of verbal techniques, he acknowledges the role of imagery in cognitive processing (Beck & Weishaar, 1989; Edwards, 1989). Given this recognition, Beck emphasizes the importance of seeking information about the client's spontaneous visual imagery with the goal of restructuring

apparent distortions; this is analogous to the process of restructuring maladaptive

statements.  Schematic representations of reality are neither essentially verbal nor visual;

consequently, they can be interpreted and restructured through either modality (Edwards,

1989).

Throughout the course of CT, the therapist and client collaborate to shift

information processing from the "primitive" or dysfunctional level to the adaptive or

functional level (Beck & Weishaar, 1989).  The process builds on two core elements of

information processing.  First, the therapist and client utilize reality testing by directing

the client's attention to evidence that contradicts or refutes his or her conclusions.

Second, the therapist coaches the client to take in all relevant data in a given situation, not

only the data that support the client's dysfunctional beliefs.  This process expands and

enhances the client's ability to process cognitive information accurately.  Concurrently,

the process of devising experiments to tests beliefs also expands the client's attention

processes and allows the introduction of alternative explanations.  Thus by drawing on

strategies that allow the flow of information contradicting distorted beliefs and by

expanding the client's ability to appraise information, CT facilitates the client's return to

a functional information processing system.

*Self-Statements in Cognitive Therapy.*

Cognitive distortions are evident in negative self-statements.  Meichenbaum

(1977), who developed the concept of the internal dialogue or inner speech, asserted that

people often make distorted appraisals because of an internal dialogue that reinforces

maladaptive beliefs. Essentially, the goal of psychotherapy is to replace negative self-talk

with positive self-talk.  By engaging in positive self-talk, clients clarify goals, come to

understand the obstacles they may encounter, provide self-instructions on ways they can cope with and ultimately surmount barriers to positive change. As in conventional cognitive therapy, the therapist works with the client to alter maladaptive self-talk by helping the client come to terms with the detrimental and self-defeating internal dialogue, teaching the client to counter negative self-talk with positive affirmations.

Positive self-instruction is a technique employed to challenge and alter negative self-talk. Noting that few studies have directly assessed the effectiveness of positive self-instruction, Lange, Richard, Gest, de Vries, and Lodder (1998) conducted a study of 90 college students whose low self-esteem scores were comparable to those of clinical patients. Told they were part of a study on "Mood and Writing", participants in the experimental group were requested to compile a list of their positive attributes and incorporate them into an essay. They were then given the assignment to reduce the essay to a number of positive self-statements, ultimately transferring their statements to a small card that that they read aloud twice each day for three weeks.

After three weeks, the self-instruction task demonstrated a decisive positive impact on the participants' self-esteem (Lange et al., 1998). The task was simple to carry out, and Lange et al. suggest that it appeals to individuals with low-self esteem because it is done in private. Lange et al. noted that, in general, few researchers focus on a specific component of CT or CBT, emphasizing, instead, the utility of the overall intervention. Their study showed that even in isolation, positive self-instruction exerts a powerful impact on self-defeating cognitions.

*Rational Emotive Behavior Therapy.*

REBT has some theoretical distinctions from cognitive therapy; however, REBT operates in a manner similar to CBT to change irrational beliefs and behavior. Dryden & Ellis (2001) outline seven tasks that are essential to eliciting a "philosophical change" either at the general or at the specific level (p. 310). Individuals who desire to change need to accomplish the following:

1. Realize that to a substantial extent, people create their own psychological disturbances; although environmental conditions may play a contributing role they are usually secondary factors in the change process,

2. Recognize that they possess the ability to change these disturbances significantly.

3. Understand that emotional and behavioral disturbances emanate primarily from irrational, absolutist, dogmatic beliefs,

4. Identify irrational beliefs and learn to distinguish between irrational beliefs and rational alternatives.

5. Dispute irrational beliefs by means of logical, empirical, scientific methods.

6. Work toward internalizing new rational beliefs through the use of cognitive, emotive, and behavioral techniques, with particular focus on ensuring that behavior is congruent with rational beliefs.

7. Continue the process of challenging irrational beliefs and using multimodal change strategies throughout the life span.

The different adaptations of CT and CBT have documented effectiveness in treating psychological distress and bringing about positive behavior change. The most successful interventions are those that most accurately match the treatment to the client's

specific needs (Eversole, 1997).  The almost limitless adaptability of CBT endows the modality with a unique advantage in this regard.  The following section will address the role of cognitive distortions in psychological disorders and health psychology with implications for targeting treatment.

In summary, there is a substantial amount of theoretical and empirical support providing the foundation for the critical importance of cognitive processes and beliefs in human behavior.  These theories outline the critical tenets and cognitive components that are likely to influence mental and physical health of patients.  One key cognitive component is the manner in which information is actively processed by patients.  The extent to which this processing is distorted may be considered as an important component in psychological and physical disorders.

*The Role of Cognitive Distortions in Psychological and Physiological Disorders*

In the subsequent sections the relationship between cognitive distortions and the manifestation both of psychological and of physical disorders is discussed.  Particular attention is given to disorders commonly seen in primary care settings.

*Depression.*

Since Beck formulated the cognitive triad, a large body of research has documented the effectiveness of cognitive therapy and cognitive-behavior therapy for treating depression (Beck, 1993). Whisman, Miller, Norman, and Keitner (1991) recruited 55 inpatients with major depression for an exploration of cognitive distortions in depression.  Thirty-one of the patients were randomly assigned either to a standard treatment format (n = 17) or to standard treatment plus CT (n = 14).  The individualized

CT sessions were based on Beck's model (Beck et al., 1979). All patients were receiving antidepressant medications.

Following treatment, patients in both groups showed significant reductions in hopelessness and automatic thoughts (Whisman et al., 1991). Distinctions between the two treatment groups were pronounced at post-treatment, at six-month and at 12-month follow-up assessments. Compared to the patients who received the standard care, patients who engaged in CT reported less hopelessness and fewer cognitive biases at all three assessments as well as fewer dysfunctional attitudes at the six-month follow-up. The differences were significant on all measures, despite the fact that for both groups there was no difference in the severity of depression. Although the comparable scores on depression may be interpreted to mean that both treatments were equally effective, Whisman et al. emphasized that CT produced "specific effects [original emphasis] on measures of cognitive distortion" (p. 286), thereby attesting to its unique impact on depressive symptoms. Drawing on the theoretical assumption that individuals with fewer cognitive distortions are less likely to become depressed in response to negative events, Whisman et al. note that depressed patients who receive CT, have demonstrated lower rates of relapse.

McDermut, Haaga, and Bilek (1997) drew on the models both of Beck (Beck, 1976; Beck et al., 1979) and of Ellis (Dryden & Ellis, 2001) in their investigation of cognitive bias and irrational beliefs in depression and dysphoria. In addition to combining both cognitive and REBT paradigms in their study, McDermut et al. took the unique approach of including adults with dysphoria (n = 21) as well as with major

depression (n = 21), and comparing their perceptions to those of a non-depressed control group (n = 34).

Individuals with depression exhibited irrational beliefs, particularly on the themes of achievement demands and low tolerance to frustrating or difficult conditions (McDermut et al., 1997). Interestingly, McDermut et al. observed only insignificant differences between the major depression and dysphoric groups, somewhat in contrast to Ellis, who postulated the idea that irrational beliefs distinguished individuals who are prone to depression from those more appropriately characterized as sad, disappointed, or frustrated. However, the results were congruent with assumptions of how cognitive biases operate in depression. Depressed individuals were more biased in their justifications of negative events but less biased in their explanations of positive events than were non-depressed individuals, thus reflecting pessimism and optimism, respectively. The responses of the dysphoric group consistently occupied a median point between the depressed and non-depressed groups, providing some evidence to support the proposition of McDermut et al. that the cognitions underlying depression fall on a continuum ranging from very mild to very severe.

Cahill et al. (2003) observed that in randomized controlled trials of psychotherapeutic interventions, participants who do not complete treatment are frequently excluded from data analyses. Thus they raise the question of whether or not the results are based on a sample of strongly motivated and committed clients as opposed to a group that reflects the diverse clientele encountered in clinical practice. To address this issue, Cahill et al. based their study of CT for depression on 58 clients who were referred to a jointly managed health service and clinical research clinic. The clients were

offered between 12 and 20 sessions of CT for depression.  Of the original 58 clients, 23 dropped out before completing 12 sessions, or before completing the number of sessions in their contracts with the therapist.

In general, CT proved an effective therapy for depression in the context of the routine practice setting (Cahill et al., 2003).  Not surprisingly, clients who completed the number of treatments in their contracts derived greater benefits than those who did not.  Attesting to the efficacy of CT, 71% of the completers demonstrated reliable and clinically significant improvements on the Beck Depression Inventory (BDI), whereas only 13% of the non-completers achieved such impressive changes.  Cahill et al. noted that when the two groups were compared on the extent of statistically significant change within a matched number of sessions, there were no significant distinctions between the two groups.  Furthermore, the majority of clients (70%) who withdrew from treatment attained reliable degrees of improvement.  Cahill et al. speculate that some clients may have perceived their improvement as adequate, although they caution that unresolved or subclinical symptoms leave them susceptible to relapse.  Nonetheless, the study showed that CT effectively alleviates depressive symptoms, and even a few sessions can yield some benefits.

According to the reformulation of the learned helplessness model of depression, the tendency toward internal, stable, and global explanations for negative events increases the risk of depression (Seligman et al., 1988).  Using the Attributional Style Questionnaire, Seligman et al. examined the role of explanatory styles in 39 patients undergoing CT for unipolar depression and 12 patients with bipolar disorder in the midst of a depressive episode.

The most significant finding was that the predisposition to make internal, stable, and global attributions for bad events was a powerful predictor of depression for both groups of patients (Seligman et al., 1988). The more internal, stable, and global were the attributions, the greater the severity of depression. This result held true for the unipolar depression patients at psychotherapy intake, at termination, and at one-year follow-up and for the bipolar patients during the depressive episode. Seligman et al. also observed that the explanatory style of both patient groups was more pessimistic than that of a non-clinical control group. The strong correlation between explanatory style and depression persisted over the course of CT. In addition, CT elicited marked improvements in explanatory style and depressive symptoms that endured through the follow-up. This finding supports the observation that CT effectively reduces the risk of relapse in depression (Whisman et al., 1991).

The results of their study led Seligman et al. (1988) to conclude that explanatory style remains stable in the absence of intervention although CT can alter it substantially. In a subsequent study, Burns and Seligman (1989) explored the stability of explanatory style by analyzing the responses of 30 older adults in conjunction with diaries or letters they had written an average of 52 years earlier. The intriguing result was that explanatory style for positive events showed no stability over the years, but explanatory style for negative events appeared stable. In view of a previous study demonstrating a link between pessimistic explanatory style and poor health (Peterson, Seligman, & Vaillant, 1988), Burns and Seligman (1989) asserted that dysfunctional explanatory styles might make individuals vulnerable to physical and psychological distress. At the same

time, the study of depressed patients showed that CT has the potential to alter explanatory style successfully with results that last over time (Seligman et al., 1988).

*Anxiety Disorders.*

Next to depression, CBT for anxiety has the strongest empirical support (Beck, 1993). Anxiety reflects individual perceptions of danger or threat (Freeman & Simon, 1989). The threat is perceived as directed at the self or domain (focus of threat), from the world (locus of threat), and involves present or future consequences (direction of threat).

CBT for anxiety begins with the introduction of an actual situation, which the client assesses according to his or her basic beliefs and assumptions (Freeman & Simon, 1989). The assessment may yield either perceived threat, which elicits feelings of danger, or perceived self-efficacy, whereby the situation is viewed as a challenge rather than as a threat. Whereas mastery of challenging situations reinforces self-efficacy, avoiding situations perceived to be threatening diminishes self-efficacy and reinforces maladaptive responses.

The cognitive content of anxiety differs according to the specific disorder (Freeman & Simon, 1989). In generalized anxiety, the individual experiences a fear or threat of physical or psychological danger. In panic disorders, the perception of fear of threat is transformed into a catastrophic misconception of external stimuli. The response is not simply, "I'm worried about that"; it is more likely to be "I'm going to die" (p. 352). For people with phobias, danger or threat is perceived under specific conditions or circumstances, or alternately, related to fear of a specific entity. The initial diagnosis provides the therapist with some idea of the cognitive structure of the client's automatic

thoughts.  However, it is only a rough draft that serves as a starting point for more detailed cognitive assessment.

Treating anxiety from a cognitive orientation involves a cognitive assessment and case formulation and includes the principles and techniques of classic cognitive therapy (Freeman & Simon, 1989).   However, anxiety can impact virtually all response systems, eliciting symptoms that may be experienced as affective/emotional, behavioral, physiological, or cognitive   Therefore, the treatment of anxiety entails the utilization of a repertoire of cognitive and behavioral strategies.  Distraction, guided imagery, and relaxation training are common components of CBT for anxiety.

Unrelenting high levels of anxiety can be extremely debilitating (Freeman & Simon, 1989).  Unresolved anxiety may translate into chronic stress, which has been linked with suppressed immune functioning (O'Leary, 1990).  The appraisal of situations in ways that provoke a stress response rather than the motivation to overcome challenges may be associated with vulnerability to the detrimental effects of chronic stress.  The psychosocial interventions O'Leary recommends for immune-related illnesses are consistent with the multifaceted interventions used in CBT for anxiety (Freeman & Simon, 1989).

Anxiety is ubiquitous in-patients who have been diagnosed with cancer. Walker (2004) refers to the "Damocles syndrome," which locks patients with cancer in a constant state of anxiety over the prospect of recurrent disease.  Psychosocial interventions for cancer patients include cognitive restructuring, problem solving, stress management, and behavior modification techniques (Lev & Owen, 2000).  A dominant goal of therapy is enhancing perceptions of self-efficacy.  Guided imagery has been found to increase

lymphokine activated (LAK) cell activity and increase T cell counts of patients with

breast cancer (Walker, 2004).

Ronalds, Creed, Stone, Webb, and Tomenson (1997) investigated the outcomes of

individuals with anxiety or panic disorder and depression that were treated in the primary

care setting. For patients who had depressive or anxiety symptoms for less than six

months, 42% of each group showed some improvement. Among patients with a disorder

of less than six months duration, however, 71% of patients with depression showed

improvement compared to 52% of those with anxiety disorders. As opposed to the

naturalistic study of Cahill et al. (2003), the patients surveyed by Ronalds et al. (1997)

were provided with no specific interventions for their psychological disorders. Although

there is less documentation of the impact of CBT on the cognitive aspects of anxiety

disorders, the study of Cahill et al. (2003) clearly illustrates the benefits of structured

cognitive therapy sessions for reducing psychological distress in the clinical practice

setting.

*Interpersonal Relationships.*

Problems with interpersonal relationships are ubiquitous among individuals

regardless of whether or not they experience psychological disturbances. Although the

presence of a psychological disorder usually undermines the ability to engage in positive

social interactions, distorted beliefs about relationships are associated with lower

relationship satisfaction in otherwise healthy individuals. Hamamci (2002) addressed

this problem through an innovative approach that synthesized psychodrama with

cognitive and behavioral strategies. The study involved 24 college students who scored

above average on the Interpersonal Cognitive Distortion Scale (ICDS).

The integrated psychodrama and CBT intervention successfully decreased cognitive distortions related to intimacy avoidance, to unrealistic relationship expectancy, and to mind reading. As described by Hamanci (2002) the approach is somewhat similar to the gestalt-oriented guided imagery Edwards (1989) incorporates into CBT. Hamanci (2002) proposed that the psychodrama techniques of soliloquy, role reversal, and doubling might have been effective even without CBT strategies. At the same time, there is more empirical support for the effectiveness of CBT over a range of psychosocial disturbances, suggesting that the use of psychodrama alone might have weakened the positive impact of the combined intervention.

*Medical Health Conditions.*

Ronalds et al. (1997) conceded that outcomes for psychological disorders in primary care are extremely variable, with reported recovery rates ranging from 25% to 70%. There are no precise treatment guidelines and opinions vary widely. Some experts argue that the general practitioner should do little to intervene, yet others stress the importance of accurate assessment and active intervention.

The increasing popularity of clinical health psychology works to ensure that patients have the opportunity to address psychosocial problems related to physical illness (Belar & Deardoff, 1995). Clinical health psychologists have knowledge of the impact that physical illness has on mental health (for example, anxiety and depression in patients with cancer and HIV/AIDS) as well as a spectrum of diagnostic and therapeutic techniques that are common to psychology practice in general. With respect to cognitive processing, a crucial task for the clinical health psychologist is to understand the meaning that the patient attaches to his or her illness. More broadly, Belar and Deardoff

recommend that the clinician should be aware of the patient's worldview and general cognitive style.

As with cognitive therapy in general, a thorough assessment is requisite for effectively targeting intervention. The assessment should provide the clinician with understanding of: 1) the patient's physical and social environment, 2) the patient's relevant strengths and weaknesses, 3) evidence of psychological disturbance, 4) the nature of the disease and treatment regimen, and 5) the coping skills being utilized (Belar & Deardoff, 1995).

Belar and Deardoff (1995) formulated seven key questions to guide intervention. The questions address the primary adaptive tasks for individuals with a medical illness. These are:

1. How is the patient dealing with pain, incapacitation, and other illness symptoms?

2. How is the patient dealing with the environment of the health care facility and specialized treatment procedures?

3. Is the patient developing and sustaining positive relationships with health care staff?

4. Is the patient remaining reasonably emotionally balanced?

5. Is the patient maintaining a positive self-image and a sense of mastery and competence?

6. Is the patient preserving social relationships with family and friends?

7. How is the patient preparing for an unpredictable future?

Belar and Deardoff (1995) emphasize the fact that the clinician need not be bound to a specific theory or assessment procedure. They regard flexibility as an advantage

although they believe in attempting to stay within the biopsychosocial conceptual framework. This perspective is quite similar to that of Eversole (1997). Given that the demands of coping with HIV/AIDS exceed what is necessary for most medical conditions, a model derived for patients with HIV illness easily encompasses the psychosocial problems clinicians are likely to encounter in medical practice environments.

 *Chronic pain.*

 The physical limitations resulting from chronic pain can have a profound adverse impact on a person's self-image (Eimer, 1989). People often begin to view themselves as nonsexual, incapable, helpless, and dependent on others. Without opportunities to counter these negative self-perceptions, patterns of self-defeating beliefs and feelings are reinforced, forming a "downward spiral" of negative and depressive cognitions.

 Managing chronic pain through CBT is guided by several basic assumptions (Eimer, 1989). First, individuals are capable of filtering sensory input and selectively focusing attention, thus patients can learn to focus on stimulus sensations other than pain. A second assumption, which is addressed implicitly by Belar and Deardoff (1995), is that cognitive interpretations of pain have a dramatic impact on the pain experience (Eimer, 1989). A third assumption is that the chronic pain response is a "maladaptive collection of overt and covert learned behaviors" (p. 454). From this perspective, pain control is a skill that can be learned, internalized, and refined with repeated practice.

 Coping strategies, deep muscle relaxation, deep breathing techniques, distraction, and guided imagery are CBT techniques routinely used in pain management (Eimer, 1989). Strategically focused, they can be employed as needed at all phases of the pain

experience. Indeed, these strategies are an integral part of the package designed to enable cancer patients to cope with nausea, fatigue, and anxiety related to chemotherapy as well as with cancer-related pain (Kwekkeboom, 2001; Walker, 2004; Walker et al., 1999). Research with cancer patients confirms the efficacy of CBT strategies for reducing psychological distress and enhancing both physical and cognitive functioning.

Smith, Christensen, Peck, and Ward (1994) conducted a longitudinal study of cognitive distortion and depression in individuals experiencing chronic pain due to rheumatoid arthritis. Results indicated that higher levels of cognitive distortion and perceived helplessness predicted higher levels of depressive symptoms over a four-year span. Patients initially exhibiting tendencies toward overgeneralization, selective abstraction, personalization, and catastrophizing were more vulnerable to depression for the duration than were patients who displayed a more adaptive cognitive style. The same pattern extended to patients who reported feelings of helplessness and loss of control. Cognitive distortion and helplessness showed no relationship to baseline levels of disability, thus underscoring the powerful role that subjective perceptions play in an individual's response to chronic pain.

*HIV/AIDS.*

CBT interventions for people with HIV/AIDS tend to emphasize behavioral strategies, notably for the purpose of reducing the harmful consequences of stress (Antoni et al., 1991). Church (1998) emphasizes the importance of cognitive strategies for helping individuals cope with an illness replete with themes such as loss, uncertainty, self-blame, anger, stigmatization, and diminished self-worth. Although acknowledging parallels between the situations of individuals with HIV disease and individuals with

cancer, there are unique aspects of the disease progression and treatment of HIV/AIDS, and even more pronounced in the social situation of people with HIV/AIDS, that make them particularly vulnerable to depression. Church advocates a highly individualized approach focused on reducing feelings of hopelessness and helplessness and helping clients with HIV/AIDS regain a sense of control over themselves, over their situations, and over their futures. Church's model places much more emphasis on social and situational factors than on traditional cognitive therapy for depression.

*Diabetes management.*

In a survey of 704 adults with diabetes, self-efficacy and autonomous self-regulation were independent predictors of dietary adherence and life satisfaction (Senecal et al., 2000). Consistent with the body of self-efficacy research (Bandura, 1997), self-efficacy proved the more powerful predictor of dietary self-care. Conversely, autonomous self-regulation was more strongly related to life satisfaction. Senecal et al. proposed that self-efficacy largely determines dietary self-care activities; however, perceived happiness in life reflects the personal significance one attaches to self-care activities.

Based on their findings, Senecal et al. (2000) advocate designing interventions for individuals with diabetes, integrating self-efficacy and autonomous self-regulation into a model of motivation. This approach should promote adherence to a self-management regimen while simultaneously enhancing life satisfaction.

Critics of rational models of health behavior practices such as the Health Belief Model (HBM) argue that these are based on the fallacy that people rationally evaluate health-related information and make decisions to act accordingly (Christensen, Moran, &

Wiebe, 1999).  Christensen et al. note that although the role of cognitive distortion is recognized in producing maladaptive behavior, virtually no attention has been given to the prospect that cognitive distortion may impact health-related behavior.  To examine this issue, the researchers developed the Irrational Health Belief Scale (IHBS) to assess individual tendencies toward health-related cognitive distortions.  The purpose of their study was to provide initial validation of the unique instrument.  The IHBS was tested on a non-clinical sample of college students (N = 392) and a clinical sample of adults with Type 1 diabetes (N = 107).

Results from the college student sample indicated that the IHBS possessed internal validity and stability (Christensen et al., 1999).  Elevated scores on health-related cognitive distortions were linked with lower internal health locus of control beliefs and higher chance locus of control beliefs, and with lower positive affect and higher negative affect.  In the sample of adults with diabetes, higher scores on the IHBS showed a significant correlation with objective measures of poor diabetes management (higher blood glucose levels) and of self-reports of adherence to a diabetes management regimen.

The combined findings of Senecal et al. (2000) and Christensen et al. (1999) support the need for designing health interventions that encompass both behavioral and cognitive aspects of health self-management.  Analogous to CBT interventions for psychological disorders, health interventions should include techniques for correcting cognitive distortions that undermine adherence and behavioral techniques to enhance self-efficacy.

*Cardiac disease.*

Prevalence rates of clinically significant depressive symptoms among cardiac patients have been estimated at 14% to 27% (Shnek, Irvine, Stewart, & Abbey, 2001). Although these rates are disturbing, Shnek et al. contend that the toll of depressive symptoms on cardiac patients rises even higher in view of the adverse impact that non-clinical depression can have on health outcomes. Drawing on research that related depressive symptoms among chronic disease patients with learned helplessness, cognitive distortions, self-efficacy, and dispositional optimism, Shnek et al. devised the first study to examine relationships among these factors in patients with ischemic heart disease ($N =$ 86).

Not unexpectedly, higher levels of learned helplessness and cognitive distortions and lower levels of self-efficacy and optimism were significantly related to depressive symptoms both at one month after hospital discharge and after one year of recovery (Shnek et al., 2001). Consistent with the theory that optimism is a stable personality trait, optimism had the most consistent effect over time. In contrast, the influence of cognitive distortions dissipated over time. Given the powerful and persistent impact of optimism on depressive symptoms, Shnek et al. suggest targeting CBT interventions for chronic disease patients who hold pessimistic beliefs so that the focus is on strategies to promote positive thinking and optimism.

Traditionally, the emphasis in research on cardiac disease was not on depressive symptoms but rather on the Type A behavior pattern (TABP) thought to be a predisposition to coronary heart disease (CHD) (Booth-Kewley & Friedman, 1987). The defining characteristics of TABP are relentless achievement striving, time urgency and

impatience, aggression, and hostility.  Despite the presumed equation between TABP and CHD, Booth-Kewley and Friedman questioned the reliability of the association and the degree to which the relationship might exist.

To explore the relationship between TABP and CHD, Booth-Kewley and Friedman (1987) conducted a meta-analysis of 83 studies conducted between 1945 and 1984.  The meta-analysis led to several conclusions.  TABP did show a reliable association with CHD although the effect was no more than modest.  A possible explanation for the limited effect was the way in which aspects of Type A behavior influenced the development of CHD.  Although the hard-driving and competitive features of TABP appeared to be related to CHD, there was no evidence to support the role of time urgency or intense job involvement.  The most powerful predictors of coronary disease were anger and hostility.

Depression proved to be related to cardiovascular disease.  As depression has historically been neglected as a risk factor, Booth-Kewley and Friedman (1987) emphasized the fact that its role in cardiovascular disease needed to be more fully explored.  Anxiety showed a much lesser relationship to cardiovascular disease.

Since Booth-Kewley and Friedman (1987) conducted their meta-analysis, more attention has been given to personality and behavioral factors other than those attributed to TABP.  At the time, the authors were innovative in challenging the predominant image of the cardiac-prone individual as a perpetually driven, impatient workaholic.  The portrayal that emerged from their research was that of an individual with one or more negative emotions; although possibly aggressively competitive and angry as the traditional model presupposed, the person might also be depressed, easily frustrated,

anxious, or have some combination of these characteristics. Of particular significance, the term Booth-Kewley and Friedman used to describe an individual predisposed toward CHD or related diseases was a "maladapted personality" (p. 358).

*Psychoneuroimmunology*

A decade ago, Kiecolt-Glaser and Glaser (1992) published a review of research illustrating the harmful effects of stress on immune functioning. At the time, psychoneuroimmunology (PNI) was in a fledgling state, and the accumulating body of research stimulated interest in creating interventions capable of enhancing immune functioning. Researchers utilized a variety of techniques including hypnosis, relaxation, physical exercise, classical conditioning, exposure, and CBT. The populations involved were as diverse as the strategies, encompassing student and community volunteers, older adults, patients with cancer and HIV/AIDS, and individuals with snake phobia. Although Kiecolt-Glaser and Glaser noted numerous methodological flaws and weaknesses in the studies (notably excluding data on health-related behaviors that affect immune system activity), they saw considerable potential in the area of PNI intervention.

Given the stress associated with the diagnosis and treatment of cancer and HIV/AIDS, and the vital importance of diminishing the physical and psychological consequences of stress, these two illnesses assume a prominent role in PNI research. Antoni et al. (1991) investigated the use of a CBT stress management intervention in a group of gay men who had recently been informed of their HIV-positive status. Participants who practiced relaxation exercises more frequently experienced significant increases in T-helper cells and natural killer (NK) cells as well as slight improvements in other biological markers of immune functioning. Although the intervention did not

diminish depressive symptoms, the participants did not exhibit the increased depression that was prominent in the seropositive men who formed a control group.

Research on guided imagery for cancer patients generally focus on the alleviation of physical and psychological distress. A study of guided imagery and relaxation recorded increased lymphokine activated (LAK) cell activity and increased T cell counts in women with breast cancer (Walker, 2004). The more vivid the images created, the higher the women's natural killer (NK) and LAK activity after chemotherapy and 12 weeks after completing radiation treatment. Women who participated in guided imagery and relaxation therapy reported enhanced mood and quality of life and better coping ability, but those assigned to a control group reported more depression and lower quality of life during chemotherapy.

Anderson, Kiecolt-Glaser, and Glaser (1994) conceptualized a biobehavioral framework for structuring and researching interventions for cancer patients that would allow researchers to examine and analyze more fully the complex relationships between psychosocial stressors, disease factors, and health outcomes. Although studies have documented the positive impact of therapeutic interventions on biological markers of immune system activity, there is still an issue of whether or not this translates into better health outcomes for individuals with life-threatening illnesses.

Kiecolt-Glaser, McGuire, Robles, and Glaser (2002) recently updated their research on PNI. Recent studies have disclosed a link between inflammation and a range of conditions related to aging, including cardiovascular disease, osteoporosis, arthritis, Type 2 diabetes, some lymphoproliferative diseases or cancers, Alzheimer's disease, frailty and functional decline, and periodontal disease. Offering evidence of a direct

channel between emotions and health, it has been found that negative emotions and stressful experiences  activate cytokines (proteins released by cells that act as intercellular messengers, regulating immune responses to injury and infection) that induce inflammation.  Through the same mechanism, negative emotions may also work to prolong infection and delay wound healing.  Susceptibility is highest for older adults. The presence of psychosocial resources such as social relationships and positive emotions and coping styles may buffer the effect by exerting a positive impact on immune and endocrine regulation.

In a meta-analysis of 85 PNI studies, Miller and Cohen (2001) found only modest evidence that psychological interventions have the power to regulate immune responses. Hypnosis and classic conditioning yielded the most reliable results but results for relaxation exercises were minimal.  The conclusion of Miller and Cohen can best be interpreted as cautious optimism.  They propose that under certain conditions, interventions may have the ability to reliably impact immune functioning.

In summary, cognitive distortions and processes appear to play an important role in a variety of psychological and physical disorders commonly seen in the family medicine center.  In the next section the role of diagnostic inventories in identifying important clinical data is discussed.  These inventories provide a useful vehicle for assessing parameters of relevance to disorders.

*Utility of Diagnostic Inventories*

The most widely recognized diagnostic tool in cognitive therapy is the Beck Depression Inventory (BDI).  With documented utility in clinical and non-clinical populations there is also a correlation between the BDI-II and the Beck Anxiety

Inventory (BAI), consistent with the notion that symptoms of depression and anxiety often coexist (Steer & Clark, 1997). The BDI has also been adapted for use with chronic pain patients, through omission of items reflecting somatic symptoms that overlap with depression (Belar & Deardorff, 1995).

Despite overlap between symptoms of depression and anxiety, there is evidence that different patterns of cognitive processing occur in depressed and anxious states. Ingram, Kendall, Smith, Connell, and Ronan (1987) based their study of cognitive specificity on depression and test anxiety. The instruments they used included the Attributional Style Questionnaire (ASQ), Automatic Thoughts Questionnaire (ATQ), and Cognitive Interference Questionnaire (CIQ).

Depressed participants were distinguished by their endorsement of decreased self-serving attributions and negative self-relevant automatic thoughts (Ingram et al., 1987). Anxious participants, on the other hand, showed reliably higher levels of cognitive interference. To Ingram et al., the most compelling evidence in favor of cognitive specificity came from incident recall data. Both "purely" depressed individuals and "purely" anxious individuals showed superior processing efficiency for information that was congruent with their internal belief systems. Ingram et al. conceptualized the differential patterns of cognitive processing involved in depression and anxiety according to the taxonomy outlined by Kendall (1992).

*Automatic Thoughts Questionnaire.*

Automatic Thoughts Questionnaire (ATQ) was developed to assess the frequency of negative self-relevant cognitions. The ATIQ occupies an important role in facilitating the understanding of the negative cognitions associated with psychological disturbances

and of the activity of cognitive change mechanisms (Ingram et al., 1995). However, investigators have been slow to recognize the value of assessing positive cognitive factors. Consequently, Ingram et al. examined the psychometric properties of the Positive Automatic Thought Questionnaire (ATQ-P), which parallels the original ATQ (ATQ-N). Like the ATQ-N, the ATQ-P contains 30 self-statements and individuals are asked to rate the extent to which these self-statements occurred during the previous week. The instrument appeared to be stable and reliable, showing an inverse correlation with negative affective states. Like the ATQ-N, the ATQ-P was consistent with theoretical expectations and effectively reflected cognitive changes. The presence of a complement to the ATQ-N may enable researchers to gain a more precise understanding of the complex cognitive processes underlying psychological disorders.

*Inventory of Cognitive Distortions.*

Consistent with its title, Yurica and DiTomasso's Inventory of Cognitive Distortions (ICD) offers the most specific assessment of cognitive distortions (Yurica, 2002). Derived from the cognitive literature and the developers' clinical experience, the ICD consists of 69 items that effectively capture self-statements reflecting cognitive distortions and irrational beliefs as outlined by Beck (Beck & Weishaar, 1989), Burns (1999), and Ellis (Dryden & Ellis, 2001). The ICD is extremely comprehensive; in fact, its length may be a drawback in terms of time for administration;15 to 20 minutes are required to complete the survey. Development of a short form may be possible if redundancies are eliminated. Yurica (2002) acknowledged that the time needed to complete the ICD limits its utility as a tool for assessing changes in cognitive distortions for research purposes.

A comprehensive instrument like the ICD may be particularly valuable for targeting and focusing treatment. In addition to being a direct measure of 11 cognitive distortions, the ICD correlates with the BDI-II and BAI (Yurica, 2002). Further support for the ICD was found by Rosenfield (2004) when he examined the relationship between cognitive distortions and psychological disorders across diagnostic axes. His research utilized the ICD to measure cognitive distortions and the Millon Clinical Multiaxial Inventory-III to assess clinical diagnoses. The ICD determined that approximately half of the variance both in the severity and in the number of psychological dysfunction was accounted for by the frequency of cognitive distortions (Rosenfield, 2004).

*Millon Behavioral Medicine Diagnostic.*

Millon Behavioral Medicine Diagnostic (MBMD) is a thorough psychosocial self-report tool developed for the purpose of assessing psychological factors that may impact the course of treatment for patients with medical conditions (Millon, Antoni, Millon, Meagher, & Grossman, 2001). Designed through consultation with health professionals across disciplines, the MBMD captures predominant themes in the attitudes, behavior, and concerns of medical patients and can be used in various health care settings. There are seven MBMD domains. The first two domains are Response Patterns and Negative Health Habits, assessing response patterns and problematic behavior that will alert the clinician to issues that deserve attention (Millon, et al., 2001). The next five domains assess psychiatric and psychosocial variables that may shape the way patients deal with health problems, identifying attitudes that may exacerbate their ailments and interfere with their overall prognosis (Millon, et al.). The domains verbatim are: Psychiatric Indications, Coping Styles, Stress Moderators, Treatment Prognostics, and Management

Guides. In most cases, the 34 hypotheses below examine all the clinical scales within the six domains that are analyzed. The entire Response Patterns domain and the clinical scale Cognitive Dysfunction were not examined.

The MBMD was tested in research involving patients with a variety of diseases including cardiovascular diseases, HIV/AIDS, diabetes, and cancers (Millon et al., 2001). The studies found that information about a patient's coping styles and health-related attitudes can be important predictors of responses and behaviors, with patterns differing according to medical diagnoses. The researchers also noted that the MBMD scales that address emotional status, cognitive functioning, and medication abuse could be applied to predict certain health behaviors such as adherence to the complex medication regimen involved in the management of HIV/AIDS (Millon, et al.). In short, the detailed psychosocial profile yielded by the MBMD showed substantial utility for enhancing the biopsychosocial status of medically ill patients, thereby producing more favorable health outcomes.

Prevalence Scores (PS) between 60 and 74 are suggestive but are not sufficiently indicative of a scale's symptom pathology unless they stand clearly as the highest score in this segment of the profile (Millon, et al., 2001). Scores of 75 to 84 (inclusive) suggest the presence of the scale's disorder; scores of 85 and above provide strong support for the prominence of the pathological symptom (Millon, et al.).

*Research Hypotheses*

Psychological and behavioral factors were operationalized as MBMD scale scores, whereas the cognitive distortions factor was operationalized as Total ICD scores. The following research hypotheses were posited:

$H_1$: There will be a significant, positive correlation between Introversive coping style score, as measured by the MBMD, and total score on the ICD.

$H_2$: There will be a significant, positive correlation between Inhibited coping style score, as measured by the MBMD, and total score on the ICD.

$H_3$: There will be as significant, positive correlation between Dejected coping style score, as measured by the MBMD, and total scores on the ICD.

$H_4$: There will be as significant, positive correlation between Cooperative coping style score, as measured by the MBMD, and total scores on the ICD.

$H_5$: There will be as significant, negative correlation between Sociable coping style score, as measured by the MBMD, and total scores on the ICD.

$H_6$: There will be as significant, negative correlation between Confident coping style score, as measured by the MBMD, and total scores on the ICD.

$H_7$: There will be as significant, positive correlation between Nonconforming coping style score, as measured by the MBMD, and total scores on the ICD.

$H_8$: There will be as significant, positive correlation between Forceful coping style score, as measured by the MBMD, and total scores on the ICD.

$H_9$: There will be as significant, negative correlation between Respectful style score, as measured by the MBMD, and total scores on the ICD.

$H_{10}$: There will be a significant, positive correlation Oppositional coping style score, as measured by the MBMD, and total score on the ICD.

$H_{11}$: There will be a significant, positive correlation between Denigrated coping style score, as measured by the MBMD, and total score on the ICD.

$H_{12}$: People who have a Likely Alcohol Problem Area score, as measured by the MBMD, will have a significantly higher total score on the ICD than those people who have an Unlikely Alcohol Problem Area score.

$H_{13}$: People who have a Likely Drug Problem Area score, as measured by the MBMD, will have a significantly higher total score on the ICD than those people who have an Unlikely Drug Problem Area score.

$H_{14}$: People who have a Likely Eating Problem Area score, as measured by the MBMD, will have a significantly higher total score on the ICD than those people who have an Unlikely Eating Problem Area score.

$H_{15}$: People who have a Likely Caffeine Problem Area score, as measured by the MBMD, will have a significantly higher total score on the ICD than those people who have an Unlikely Caffeine Problem Area score.

$H_{16}$: People who have a Likely Inactivity Problem Area score, as measured by the MBMD, will have a significantly higher total score on the ICD than those people who have an Unlikely Inactivity Problem Area score.

$H_{17}$: People who have a Likely Smoking Problem Area score, as measured by the MBMD, will have a significantly higher total score on the ICD than those people who have an Unlikely Smoking Problem Area score.

$H_{18}$: There will be a significant, positive correlation between Anxiety-Tension score, as measured by the MBMD, and total score on the ICD.

$H_{19}$: There will be a significant, positive correlation between Depression score, as measured by the MBMD, and total score on the ICD.

$H_{20}$: There will be a significant, positive correlation between Emotional Lability score, as measured by the MBMD, and total score on the ICD.

$H_{21}$: There will be a significant, positive correlation between Guardedness score, as measured by the MBMD, and total score on the ICD.

$H_{22}$: There will be a significant, positive correlation between Illness Apprehension score, as measured by the MBMD, and total score on the ICD.

$H_{23}$: There will be a significant, positive correlation between Functional Deficits score, as measured by the MBMD, and total score on the ICD.

$H_{24}$: There will be a significant, positive correlation between Pain Sensitivity score, as measured by the MBMD, and total score on the ICD.

$H_{25}$: There will be a significant, positive correlation between Social Isolation score, as measured by the MBMD, and total score on the ICD.

$H_{26}$: There will be a significant, positive correlation between Future Pessimism score, as measured by the MBMD, and total score on the ICD.

$H_{27}$: There will be a significant, positive correlation between Spiritual Absence score, as measured by the MBMD, and total score on the ICD.

$H_{28}$: There will be a significant, positive correlation between Interventional Fragility score, as measured by the MBMD, and total score on the ICD.

$H_{29}$: There will be a significant, positive correlation between Medication Abuse score, as measured by the MBMD, and total score on the ICD.

$H_{30}$: There will be a significant, positive correlation between Information Discomfort score, as measured by the MBMD, and total score on the ICD.

$H_{31}$:  There will be a significant, positive correlation between Utilization Excess score, as measured by the MBMD, and total score on the ICD.

$H_{32}$:  There will be a significant, positive correlation between Problematic Compliance score, as measured by the MBMD, and total score on the ICD.

$H_{33}$:  There will be a significant, positive correlation between the Management Guide Adjustment Difficulties (Scale L), as measured by the MBMD, and total score on the ICD.

$H_{34}$:  There will be a significant, positive correlation between the Management Guide Psych Referral (Scale M), as measured by the MBMD, and total score on the ICD.

Methodology

*Particpants*

Study participants were recruited from Virtua Health System's two family practices located in Voorhees, New Jersey and Mount Holly, New Jersey (see Appendix C). A total of 150 adult outpatients presenting for medical evaluation and treatment participated in the study. Participation was voluntary and subjects retained the right to withdraw from the study at any time. All participants remained anonymous.  Only basic, non identifying, demographic information was gathered, in addition to the two survey data sets.  Demographic information recorded on the MBMD answer form included: age, race/ethnicity, sex, marital status, educational level, and the major problems for which the patient was seeking medical help. BIS, Demographic information included history of mental health services, current use of psychotropic medication, class of medication used, and compliance with that medication.

*Participant Inclusion Criteria*

Participants were required to meet predetermined conditions to be included in this study: They had to be between 18 to 85 years of age; have completed at least the $8^{th}$ grade, have no memory problems, have no intellectual impairment (mental retardation), suffer from no hallucinations, and have experienced no head injury resulting in reduced mental or physical functioning; be a patient of one of the two family medicine centers, presenting to see a physician to be treated for a physical or mental health problem.

*Participant Exclusion Criteria*

Excluded were participants who were below the age of 18 and above the age of 85; patients who had less than an 8th grade education and patients who suffered from memory problems, hallucinations, and head injury.

*Participant Recruitment*

Medical patients were asked if they would like to participate in a study of thoughts, feelings, and behaviors. Interested patients who met criteria were presented with a packet containing the following: Letter of Agreement to Participate in Study (Appendix H); Brief Information Sheet (Appendix D); Millon Behavioral Medicine Diagnostic test booklet and answer sheet (Appendix B); Inventory of Cognitive Distortions (Appendix A). Completion time was estimated to be approximately 45 minutes.

*Research Design*

The statistical tests that were used with all hypotheses, other than the Negative Health Habit Domains, were Pearson correlations. An ANOVA was used with Negative Health Habits with the continuous dependent variable being the ICD total score; categorical independent variables were Unlikely, Possible, or Likely problem area. Pearson correlations were also used to assess risk and protective factors in relation to the number of endorsed cognitive distortions and health risk factors.

Among those with significant pathology symptoms, as measured by the MBMD clinical scales, psychological and behavioral factors were operationalized as MBMD prevalence scores (PS),and cognitive distortions were operationalized as ICD total scores. Participant demographics, MBMD clinical scale scores, frequency of cognitive distortions, and the intercorrelation of all these factors were analyzed.

*Measures*

Test materials consisted of the ICD (Yurica, 2002), the MBMD (Millon, et al 2001), and a Brief Information Sheet (BIS).

*The Inventory of Cognitive Distortions*

The ICD was designed for and validated with an adult clinical population who experienced symptoms of anxiety and/or depression (Yurica, 2002). The ICD is a 69-item self-report inventory, which is composed of short sentences reflecting 11 factor-analyzed cognitive distortions (Appendix F). Items are scored on a five-point Likert (1932) scale ranging from 1 = Never to 5 = Always. Total possible ICD scores range from 69 to 345. Lower scores reflect less frequency of cognitive distortions than higher scores. The instrument has attained satisfactory construct and content validity. This study used the ICD total score to measure the presence of cognitive distortion. The higher the total score, the more severe are the patterns of distortion. Although they were not used, the scale also yields subscale scores of distortion (Appendix F). Yurica and DiTomasso's (Yurica, 2002) research findings proved the ICD to have good psychometric properties, which are as follows:

*ICD reliability.*

The test-retest reliability of the total ICD score is excellent. Test-retest reliability coefficient demonstrated during the initial validation study was .998 ($n = 28$, $p < .001$).

*ICD validity.*

During the initial validation study, Yurica and DiTomasso (Yurica, 2002) also demonstrated Total ICD scores has excellent criterion validity. Total ICD scores differentiated clinical outpatients from non-patient controls ($F = 15.2$, $df = 169$, $p <$

.0001). Concurrent validity was also good, Total ICD scores correlated positively and significantly with other well known and widely accepted measures of psychopathology, such as depression, the BDI-II (r = .70, N = 161, p < .0001); anxiety, the BAI (r = .59,  N = 161, p < .0001), and dysfunctional attitudes, the DAS (r = .70, N = 159, p < . 0001). The ICD is a brief self-report inventory of key cognitive processes demonstrated to have good psychometric properties (Yurica, 2002). Yurica and DiTomasso used mental health patients and a comparative normal group in their development and validation of the ICD (Yurica, 2002). Providing further validation for the ICD has implications that are beneficial both to practice and to research in a number of important respects.

When working in their practices, cognitive therapists begin treatment by taking baseline assessments using various diagnostic instruments of the current mental health of new patients. They may use instruments such as the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) throughout the treatment process as a way to monitor behavior and mood regularly. An instrument, such as the ICD, that could provide treatment progress data and finally post-treatment evidence of a successful treatment outcome, would prove to be extremely useful. 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 (e.g., Beck, Ward, Mendelson, Mock, & Erdbaugh, 1961; Butler & Beck, 2000; Hollon & Kendall, 1980; Rosenfield, 2004, Yurica, 2002) and anxiety (Ross, Gottfredson, Christensen, & Weaver, 1986; Yurica, 2002).

Research conducted by Rosenfield (2004) demonstrated that individuals meeting criteria for any diagnosis (Base Rate of 75 or greater on any MCMI-III Axis scale[s]), on

Axis I clinical disorders or on Axis II Personality Disorders, reported a higher frequency of cognitive distortions, as measured by the ICD, than those who were free of diagnosable psychological disorders. Even though the usefulness of such instruments is clear, there are very few instruments, if any, designed to assess cognitive distortions relative to their frequency to psychological and behavioral factors family practice medical setting.  This research has expanded the ICD applicability into this area.

*The Millon Behavioral Medicine Diagnostic*

The MBMD is a 165-item self-report test with 29 clinical scales, three Response Pattern scales, one validity indicator, and six Negative Health Habits indicators (Millon, et al., 2001). Estimated administration time is approximately 20 minutes.  It was designed to assess psychological and behavioral factors that can influence the course of treatment of medically ill patients (Millon, et al.).  The MBMD Domains and scales as described in the user manual are summarized in Appendices E and G.

The MBMD 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 (Millon, et al., 2001). The rationale for using PS scores is to accommodate the naturally occurring skew found in clinical data (Millon, et al.).  PS identifies the presence of a disorder rather than identifying a position of an individual on a normal distribution curve (Millon, Davis & Millon, 1997). Each disorder characteristic is described in three levels: Absent, Present, and Prominent (Millon, et al.).  A PS score of 0 is the minimum, and a PS score of 115 corresponds to the maximum valid PS score. A PS below 35 corresponds to an asset, which is an adaptive characteristic of an

individual. A PS of 75 to 84 corresponds to present (moderate) liability. A PS of 85 to 115 corresponds to prominent (marked) liability.

*MBMD reliability.*

Millon et al (2001) reported that the MBMD has demonstrated reasonably satisfactory stability and consistency. The instrument's test-retest estimates approached a medical value of .83 and internal consistency estimates achieved a median value of .79 (Millon, et al.).

*MBMD validity.*

The MBMD demonstrated good construct validity for each of the 27 clinical scales. The scales were correlated against other instruments with well-established validity. The convergent correlation's between MBMD scales and standard measures were nearly always moderate to high (.50 to .87), with the exception of Problematic Compliance (.38) or Utilization Excess (.39 to .52) (Millon, et al., 2001).

*MBMD Predictive validity.*

MBMD is the updated version of the Millon Behavioral Health Inventory (MBHI) which has been studied extensively. Because the MBMD is a relatively new inventory, limited research has been conducted using this measure. The MBHI has been shown to predict medical complications post heart transplant surgery (Millon, et al., 2001). In general, the MBHI was effective at predicting risk of complications after a major medical procedure because success for many of these complicated medical procedures depends on the patient's ability to maintain a rigorous aftercare routine (Harper, Chacko, Kotik-Harper, Young, & Gotto, 1998).

*Procedure*

The present investigator asked medical patients from Tatem-Brown Family Medicine Center and Family Medicine Center at Lumberton to participate in a study of thoughts, feelings, and behaviors.  The original study proposal provided a co-investigator to be trained to assist in the collection of data, but the co-investigator was unavailable during the research period. After a patient was asked if he or she would like to participate in a study on thoughts, feelings and behaviors, and he or she expressed an interest, the study coordinator confirmed that the interested patient met inclusion criteria.  When a patient met criteria, he or she was given a packet containing the following:

1.  Inventory of Cognitive Distortions (Appendix A)

2.  Millon Behavioral Medicine Diagnostic (Appendix  B)

3.  Brief Information Sheet (BIS) (Appendix D)

4.  Letter of Agreement to Participate in Study (Appendix H)

Before allowing the participant to begin the inventories, the study coordinator confirmed that he or she had read the Letter of Agreement and answered any question the participant may have had. Patients who completed all inventories, as well as the BIS, and who returned all materials to the study coordinator, were paid $10.00 for their time and effort.

Rather than provide a separate demographic information sheet, the BIS and MBMD contain specific demographic items, and these items were used for that purpose. The essential demographic information included: age, race/ethnicity, sex, marital status, educational level, and the major problems for which the patient was seeking medical help. Additional information gathered, from the BIS, included history of mental health

services, current use of psychotropic medication, class of medication used, and compliance with that medication.

      After the necessary data was gathered, each patient's survey responses were keyed into the Pearson Assessments Q Local (PAQL) software program.  To ensure the accuracy of the data entry, the PAQL software requires that all data points be entered twice. SPSS software was used to perform the statistical analysis of the data generated from PAQL, the ICD, and BIS.  It took approximately three weeks to collect the 147 patient samples.

Results

Pearson correlations were used with all the hypotheses except for the Negative Health Habit domains.  An Analysis of Variance (ANOVA) was used with the Negative Health Habit domains and the continuous dependent variables were the ICD total score; the categorical independent variables were Unlikely, Possible, or Likely problem area.

Pearson correlations were also used to assess risk and protective factors in relation to the number of endorsed cognitive distortions and health risk factors.  A series of ANOVAs were conducted to compare ICD total scores of those with significant pathology symptoms, as measured by the MBMD clinical scales. Psychological and behavioral factors were operationalized as MBMD prevalence scores (PS), whereas cognitive distortions were operationalized as ICD total scores. Participant demographics, MBMD clinical scale scores, frequency of cognitive distortions, and the intercorrelations of all these factors were analyzed.  The psychometric properties of the ICD were also examined.

Descriptive Results

*Sample Demographics*

It took approximately 2.5 weeks to collect the 150 patient sample.  During the study, two participants decided to leave before they completed the surveys and one participant's MBMD survey produced an invalid output.  As a result of these three dropouts, the size of the valid sample was reduced from the anticipated 150 to 147 (N=147).

*Age*

Participants ranged in age from 19 to 78 years of age.  The mean age was 37.9

with a standard deviation of 15.

*Gender*

The gender distribution for the total sample (N=147) is shown in Table 1.

Table 1

*Frequency Table of Descriptive Results*

| Gender | Frequency | Percent |
|--------|-----------|---------|
| Male   | 40        | 27.2    |
| Female | 107       | 72.8    |
| Total  | 147       | 100.0   |

*Marital Status*

Marital status was distributed as found in Table 2.

Table 2

*Frequency Table of Descriptive Results*

| *Marital Status* | *Frequency* | *Percent* |
|------------------|-------------|-----------|
| Married          | 62          | 59.2      |
| Living as Married | 15         | 10.2      |
| Single           | 51          | 34.7      |
| Divorced         | 8           | 5.4       |
| Separated        | 7           | 4.8       |
| Widowed          | 4           | 2.7       |
| Total            | 147         | 100.0     |

*Race/Ethnicity*

Race/Ethnicity was distributed according to the results shown in Table 3.

Table 3

*Frequency Table of Descriptive Results*

| Race/Ethnicity | Frequency | Percent |
|---|---|---|
| White | 87 | 59.2 |
| African-American | 44 | 29.9 |
| Hispanic | 6 | 4.1 |
| Asian-American | 4 | 2.7 |
| American Indian | 0 | 0.0 |
| Other | 6 | 4.1 |
| Total | 147 | 100.0 |

*Education*

Education was distributed according to the findings shown in Table 4.

Table 4

*Frequency Table of Descriptive Results*

| Education | Frequency | Percent |
|---|---|---|
| Did not graduate HS | 15 | 10.2 |
| High School Graduate | 58 | 39.5 |
| Technical Certificate | 20 | 13.6 |
| Associates Degree | 19 | 12.9 |
| Bachelor's Degree | 26 | 17.7 |
| Master's Degree | 8 | 5.4 |
| Doctorate | 1 | .7 |
| Total | 147 | 100.0 |

*Major Problems*

Primary and Secondary Major Problems were distributed according to the

findings shown in Table 5.

Table 5

<u>*Frequency Table of Descriptive Results*</u>

| <u>*Major Problems - Primary*</u> | <u>*Frequency*</u> | *Percent* |
|---|---|---|
| Accident/Injury | 7 | 4.8 |
| Arthritis | 11 | 7.5 |
| Cancer | 4 | 2.7 |
| Depression | 12 | 8.2 |
| Diebetes | 7 | 4.8 |
| Female (Gynecological) | 12 | 8.2 |
| Headaches | 5 | 3.4 |
| Heart Disease | 8 | 5.4 |
| HIV/AIDS | 2 | 1.4 |
| Pain | 11 | 7.5 |
| Stress Nerves | 9 | 6.1 |
| Stroke | 2 | 1.4 |
| Other | 57 | 38.8 |
| Total | 147 | 100.0 |

*Mental Health Treatment History and Medication Usage/Compliance*

Mental Health Treatment History was distributed according to the findings shown

in Table 6.

Table 6

*Frequency Table of Descriptive Results*

| Mental Health History and Medication Usage | Frequency | Percent |
|---|---|---|
| Mental Health Treatment – No | 98 | 66.7 |
| Mental Health Treatment – Yes | 49 | 33.3 |
| Total | 147 | 100.0 |
| Hospitalized for Mental Hlth. – No | 134 | 91.2 |
| Hospitalized for Mental Hlth. – Yes | 13 | 8.8 |
| Total | 147 | 100.0 |
| Taking Rx for Mental Hlth. – No | 118 | 80.3 |
| Taking Rx for Mental Hlth. – Yes | 29 | 19.7 |
| Total | 147 | 100.0 |
| Taking Anti-depressant Rx – No | 126 | 85.7 |
| Taking Anti-depressant Rx – Yes | 21 | 14.3 |
| Total | 147 | 100.0 |
| Taking Anti-anxiety Rx – No | 134 | 91.2 |
| Taking Anti–anxiety Rx – Yes | 13 | 8.8 |
| Total | 147 | 100.0 |
| Taking Mood Stabilizer Rx – No | 140 | 95.2 |
| Taking Mood Stabilizer Rx – Yes | 7 | 4.8 |
| Total | 147 | 100.0 |
| *Medication Compliance* | | |
| Always | 20 | 13.6 |
| Miss a day or two per week | 8 | 5.4 |
| Take less off than I do take Rx | 1 | .7 |
| Rarely | 118 | 80.3 |
| Not answered (not on Rx) | 147 | 100.0 |

It is to be noted that some of the 29 participants who were taking medication for a mental health problem were also taking multiple medications; as a result, the sum of the three medication categories totals more than the 29 medication-taking participants. Of the 29 participants who were taking medications for a mental health problem, 20 always took their medications as directed (69%), 8 may have missed a day or two per week in taking their medications (27.5%), They don't take their medication more often than they do take their medication (3.5%), 0 rarely take their medications as directed (0%).

*Internal Consistency*

Cronbach's Alpha for the ICD scale was .967 for all ICD items indicating excellent internal consistency and homogeneity of item content.

*The Relationship between the MBMD and the Total ICD Scores*

Data analysis was completed using Statistical Package for Social Sciences version 14.0 (SPSS 14.0). A number of Pearson Product Moment Correlation Coefficients, one-tailed were conducted to test the relationship between the number (operationalized as the MBMD Prevalence Scores (PS)) and the total frequency of cognitive distortions (hypotheses 1 through 11, and 18 through 34). When appropriate, a Levene statistic test was also conducted to measure the homogeneity of variances.

An ANOVA was used with the continuous dependent variable being the ICD total score and categorical independent variables of being were Unlikely, Possible, or Likely problem areas (hypotheses 12 through 17). A number of Pearson Correlations were also used to assess risk and protective factors in relation to the number of endorsed cognitive distortions and health risk factors. F tests were also conducted and when the overall F

was significant, a post hoc Tukey test was used to measure the significance of variance between groups.

*Coping Style Domain*

A variety of correlational analyses were conducted to test hypotheses about the relationship between ICD Total Scores and MBMD Clinical Scale scores.  These correlations for the Coping Style Domain and its clinical scales are described in Table 7 and are discussed separately below.

Table 7

*Correlation of the eleven Coping Style Clinical Scale Scores to Total ICD Score*

| Scale | ICD Total | Sig. (1-tailed) | $r^2$ |
|---|---|---|---|
| Introversive | .39** | p<.01 | .15 |
| Inhibited | .59** | p<.01 | .35 |
| Dejected | .59** | p<.01 | .35 |
| Cooperative | .46** | p<.01 | .21 |
| Sociable | -.27** | p<.01 | .07 |
| Confident | -.36** | p<.01 | .13 |
| Nonconforming | .30** | p<.01 | .09 |
| Forceful | .25** | p<.01 | .06 |
| Respectful | -.17* | p<.05 | .03 |
| Oppositional | .52** | p<.01 | .27 |
| Denigrated | .57** | p<.01 | .33 |

** Correlation is significant at the 0.01 level (1-tailed)
* Correlation is significant at the 0.05 level (1-tailed)

*Hypothesis 1 – Introversive.*

It was hypothesized that there would be a significant, positive correlation between introversive coping style score, as measured by the MBMD, and total score on the ICD. The results demonstrated a significant positive Pearson correlation coefficient ($r=.39$, $p<.01$, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2=.15$) indicating that 15% of the variability in Introversive Clinical Scale is attributable to differences in Total ICD scores.

*Hypothesis 2 – Inhibited.*

It was hypothesized that there would be a significant, positive correlation between inhibited coping style score, as measured by the MBMD, and total score on the ICD.  The results for this clinical scale also produced a significant positive Pearson correlation coefficient ($r=.59$, $p<.01$, one-tailed). This illustrates a coefficient of determination ($r^2=.35$) indicating that 35% of the variability in Inhibited Clinical Scale is associated with differences in Total ICD scores.

*Hypothesis 3 – Dejected.*

It was hypothesized that there would be a significant, positive correlation between dejected coping style score, as measured by the MBMD, and total score on the ICD.  The Pearson correlation coefficient on this clinical scale was both positive and significant ($r=.59$, $p<.01$, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2=.35$.) indicating that 35% of the variability in the Dejected Clinical Scale is attributable to differences in Total ICD scores.

*Hypothesis 4 – Cooperative.*

It was hypothesized that there would be a significant, positive correlation between cooperative coping style score, as measured by the MBMD, and total score on the ICD. Study findings for this clinical scale show a significant, positive Pearson correlation coefficient ($r=.46$, $p<.01$, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2=.21$) indicating that 21% of the variability in the Cooperative Clinical Scale is associated with differences in Total ICD scores.

*Hypothesis 5 – Sociable.*

It was hypothesized that there would be a significant, negative correlation between coping style score, as measured by the MBMD, and total score on the ICD. The results demonstrated a significant, negative Pearson correlation coefficient ($r=-.27$, $p<.01$, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2=.07$) indicating that 7% of the variability in the Sociable Clinical Scale is attributable to differences in Total ICD scores.

*Hypothesis 6 – Confident.*

It was hypothesized that there would be a significant, negative correlation between confident coping style score, as measured by the MBMD, and total score on the ICD. The results for this clinical scale also produced a significant, negative Pearson correlation coefficient ($r=-.36$, $p<.01$, one-tailed). This illustrates a coefficient of determination ($r^2=.13$) indicating that 13% of the variability in the Confident Clinical Scale is associated with differences in Total ICD scores.

*Hypothesis 7 – Nonconforming.*

It was hypothesized that there would be a significant, positive correlation between nonconforming coping style score, as measured by the MBMD, and total score on the ICD. The Pearson correlation coefficient on this scale was both positive and significant ($r=.30$, $p<.01$, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2=.09$) indicating that 19% of the variability in the Nonconforming Clinical Scale is attributable to differences in Total ICD scores.

*Hypothesis 8 – Forceful.*

It was hypothesized that there would be a significant, positive correlation between forceful coping style score, as measured by the MBMD, and total score on the ICD. Study findings for this clinical scale show a significant, positive Pearson correlation coefficient ($r=.25$, $p<.01$, one-tailed). This illustrates a coefficient of determination ($r^2=.06$) indicating that 6% of the variability in the Forceful Clinical Scale is associated with differences in Total ICD scores.

*Hypothesis 9 – Respectful.*

It was hypothesized that there would be a significant, negative correlation between respectful coping style score, as measured by the MBMD, and total score on the ICD. The results demonstrate a significant, negative Pearson correlation coefficient ($r=-.17$, $p<.05$, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2=.03$) indicating that 3% of the variability in the Respectful Clinical Scales attributable to differences in Total ICD scores.

*Hypothesis 10 – Oppositional.*

It was hypothesized that there would be a significant, positive correlation between oppositional coping style score, as measured by the MBMD, and total score on the ICD. The results for this clinical scale also produced a significant, positive Pearson correlation coefficient ($r$=.52, $p$<.01, one-tailed). This illustrates a coefficient of determination ($r^2$=.27) indicating that 27% of the variability in the Oppositional Clinical Scale is associated with differences in Total ICD scores.

*Hypothesis 11- Denigrated.*

It was hypothesized that there would be a significant, positive correlation between denigrated coping style score, as measured by the MBMD, and total score on the ICD. The Pearson correlation coefficient on this clinical scale was both positive and significant ($r$=.57, $p$<.01, one-tailed). This illustrates a coefficient of determination ($r^2$=.33) indicating that 33% of the variability in the Denigrated Clinical Scale is attributable to differences in Total ICD scores.

*Negative Health Habits*

These categorical correlations for the Negative Health Habits Domain and related clinical scales are described in Table 8 and are discussed separately below.

Table 8

*Analysis of Variance for MBMD categorical independent variables and Total ICD Score*

| Source | df | MS | F | *p* |
|--------|-----|--------|-------|--------|
| Between subjects | | | | |
| Alcohol | 2 | 1046.8 | .673 | p=.51 |
| Drug | 2 | 8456.7 | 5.821 | p<.01 |
| Eating | 2 | 6961.9 | 4.724 | p<.05 |
| Caffeine | 2 | 5187.3 | 3.462 | p<.05 |
| Inactivity | 2 | 7599.5 | 5.188 | p<.01 |
| Smoking | 2 | 5698.8 | 3.822 | p<.05 |
| Within subjects | | | | |
| Alcohol | 144 | 1555.8 | | |
| Drug | 144 | 1452.8 | | |
| Eating | 144 | 1473.6 | | |
| Caffeine | 144 | 1498.2 | | |
| Inactivity | 144 | 1464.7 | | |
| Smoking | 144 | 1491.1 | | |

*Hypothesis 12 — Alcohol.*

For each hypotheses, 12 through 17, a one way analysis of variance (ANOVA) was conducted with the continuous dependent variable being the ICD total score and categorical independent variables of being: Unlikely, Possible, or Likely Problem Areas. It was hypothesized that people who have a Likely Alcohol Problem Areas score, as measured by the MBMD, will have a significant, higher total score on the ICD than those who have an Unlikely Alcohol Problem Area score. The Levene statistic test of homogeneity of variances (Levene Statistic $=.437$, $p=.65$) was not significant, suggesting that the variances of the groups were similar. The results of the ANOVA revealed no significant difference ($F$ $(2, 144) = .67$, $p= .51$) between those unlikely to have alcohol be a problem possibly have it be a problem, or likely have it as a problem. Caution is necessary in interpreting these results because of differences in the number of subjects across these groups. The differences may affect the interpretation.

*Hypothesis 13 – Drug.*

It was hypothesized that people who have a Likely Drug Problem Areas score, as measured by the MBMD, will have a significant, higher total score on the ICD than those who have an Unlikely Alcohol Problem Area score. The Levene statistic test of homogeneity of variances (Levene Statistic $=.06$, $p=.94$) was not significant. The overall F test was significant ($F$ $(2, 144) = 5.82$, $p=.004$). A post hoc Tukey test was used to examine the significance of the differences between the groups. The Tukey test revealed there was a significant difference between those subjects who were categorized as unlikely to have a drug problem compared to those who possibly have a drug problem. The size of the difference was 32.29 with a $p<.01$. This indicates that those who were

unlikely to have a drug problem had significantly lower ICD total scores than subjects who possibly have a drug problem.  No other differences were significant. Caution is urged with the F test because of fairly substantial differences in the cell sizes.  With an ANOVA analysis it is best if cell sizes are exactly equal.

*Hypothesis 14 – Eating.*

It was hypothesized that people who have a Likely Eating Problem Areas score, as measured by the MBMD, will have a significant, higher total score on the ICD than those who have an Unlikely Eating Problem Area score. The Levene statistic test of homogeneity of variances (Levene Statistic =1.38, p=.25) was not significant.  The overall F test was significant (F $(2, 144) = 4.72$, p<.05).  A post hoc Tukey test was used to examine the significance of the differences between the groups.  The Tukey test revealed there was a significant difference between those subjects who were categorized as unlikely to have an eating problem compared to those who possibly have an eating problem.  The size of the difference was 19.37 with a p=.01. This indicates that those who were unlikely to have an eating problem had significantly lower ICD total scores than subjects who possibly have an eating problem.  No other differences were significant. Again, caution is urged with the F test because of fairly substantial differences in the cell sizes.

*Hypothesis 15 – Caffeine.*

It was hypothesized that people who have a Likely Caffeine Problem Areas score, as measured by the MBMD, will have a significant, higher total score on the ICD than those who have an Unlikely Caffeine Problem Area score. The Levene statistic test of homogeneity of variances (Levene Statistic =1.87, p=.16) was not significant.  The

overall F test was significant (F (2, 144) = 3.46, p<.05). A post hoc Tukey test was used to examine the significance of the differences between the groups. The Tukey test revealed there was a significant difference between those subjects who were categorized as unlikely to have a caffeine problem compared to those who likely had a caffeine problem. The size of the difference was 26.82 with a p<.05. This indicates that those who were unlikely to have a caffeine problem had significantly lower ICD total scores than subjects who likely have a caffeine problem. No other differences were significant. Caution is urged with the F test because of fairly substantial differences in the cell sizes.

    *Hypothesis 16 – Inactivity.*

    It was hypothesized that people who have a Likely Inactivity Problem Areas score, as measured by the MBMD, will have a significant, higher total score on the ICD than those who have an Unlikely Inactivity Problem Area score. The Levene statistic test of homogeneity of variances (Levene Statistic =.36, p=.70) was not significant. The overall F test was significant (F (2, 144) = 5.19, p<.01). A post hoc Tukey test was used to examine the significance of the differences between the groups. The Tukey test revealed there was a significant difference between those subjects who were categorized as unlikely to have an inactivity problem compared to those who likely have an inactivity problem. The size of the difference was 27.12 with a p<.01. This indicates that those who were unlikely to have an inactivity problem had significantly lower ICD total scores than subjects who were unlikely to have an inactivity problem. No other differences were significant. Caution is urged with the F test because of fairly substantial differences in the cell sizes.

*Hypothesis 17 – Smoking.*

It was hypothesized that people who have a Likely Smoking Problem Areas score, as measured by the MBMD, will have a significant, higher total score on the ICD than those who have an Unlikely Smoking Problem Area score. The Levene statistic test of homogeneity of variances (Levene Statistic =.73, p=.48) was not significant. The overall F test was significant (F(2, 144) = 3.82, p<.05). A post hoc Tukey test was used to examine the significance of the differences between the groups. The Tukey test revealed there was a significant difference between those subjects who were categorized as unlikely to have a smoking problem compared to those who likely have a smoking problem. The size of the difference was 27.83 with a p<.05. This indicates that those who were likely to have a smoking problem had significantly lower ICD total scores than subjects who were likely to have a smoking problem. No other differences were significant. Caution is urged with the F test because of fairly substantial differences in the cell sizes.

*Psychiatric Indication*

The correlations for the Psychiatric Indication Domain and its clinical scales are described in Table 9 and are discussed separately below.

Table 9

*Correlation of the four Psychiatric Indication Scores to Total ICD Score*

| Scale | ICD Total | Sig. (1-tailed) | $r^2$ |
|---|---|---|---|
| Anxiety-Tension | .47** | p<.01 | .22 |
| Depression | .50** | p<.01 | .25 |
| Emotional Lability | .43** | p<.01 | .19 |
| Guardedness | .21** | p<.01 | .04 |

** Correlation is significant at the 0.01 level (1-tailed)
* Correlation is significant at the 0.05 level (1-tailed)

*Hypothesis 18 – Anxiety-Tension.*

It was hypothesized that there would be a significant, positive correlation between the psychiatric indicator score for anxiety-tension, as measured by the MBMD, and total score on the ICD. The results demonstrate a significant, positive Pearson correlation coefficient (r=.47, p<.01, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2$=.22) indicating that 22% of the variability in the Anxiety-Tension Clinical Scale is attributable to differences in Total ICD scores.

*Hypothesis 19 – Depression.*

It was hypothesized that there would be a significant, positive correlation between the psychiatric indicator score for depression, as measured by the MBMD, and total score on the ICD. The results for this clinical scale also produced a significant, positive Pearson correlation coefficient (r=.50, p<.01, one-tailed). This illustrates a coefficient of

determination ($r^2$=.25) indicating that 25% of the variability in the Depression Clinical Scale is associated with differences in Total ICD scores.

   *Hypothesis 20 – Emotional Lability.*

   It was hypothesized that there would be a significant, positive correlation between the psychiatric indicator score for emotional lability, as measured by the MBMD, and total score on the ICD. The Pearson correlation coefficient for this clinical scale was both positive and significant ($r$=.43, $p$<.01, one-tailed). This illustrates a coefficient of determination ($r^2$=.19) indicating that 19% of the variability in the Emotional Lability Clinical Scale is attributable to differences in Total ICD scores.

   *Hypothesis 21 – Guardedness.*

   It was hypothesized that there would be a significant, positive correlation between the psychiatric indicator score for guardedness, as measured by the MBMD, and total score on the ICD. Study findings for this clinical scale show a significant positive Pearson correlation coefficient ($r$=.21, $p$<.01, one-tailed). This illustrates a coefficient of determination ($r^2$=.04) indicating that 4% of the variability in the Guardedness Clinical Scale for which an individual met criteria was attributable to differences in Total ICD scores.

*Stress Moderators*

   The correlations for the Stress Moderators Domain and its clinical scales are described in Table 10 and are discussed separately below.

Table 10

*Correlation of the six Stress Moderators Scores to Total ICD Score*

| Scale | ICD Total | Sig. (1-tailed) | $r^2$ |
|---|---|---|---|
| Illness Apprehension | .34[**] | p<.01 | .12 |
| Functional Deficits | .21[**] | p<.01 | .04 |
| Pain Sensitivity | .31[**] | p<.01 | .10 |
| Social Isolation | .36[**] | p<.01 | .13 |
| Future Pessimism | .31[**] | p<.01 | .10 |
| Spiritual Absence | -.006 | p=.47 | ---- |

[**] Correlation is significant at the 0.01 level (1-tailed)
[*] Correlation is significant at the 0.05 level (1-tailed)

*Hypothesis 22 – Illness Apprehension.*

It was hypothesized that there would be a significant, positive correlation between the stress moderator score for illness apprehension, as measured by the MBMD, and total score on the ICD. The results demonstrate a significant, positive Pearson correlation coefficient (r=.34, p<.01, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2$=.12) indicating that 12% of the variability in the Illness Apprehension Clinical Scale is attributable to differences in Total ICD scores.

*Hypothesis 23 – Functional Deficits.*

It was hypothesized that there would be a significant, positive correlation between the stress moderator score for functional deficits, as measured by the MBMD, and total score on the ICD. The results for this clinical scale also produced a significant, positive

Pearson correlation coefficient ($r$=.21, $p$<.01, one-tailed). This illustrates a coefficient of determination ($r^2$=.04) indicating that 4% of the variability in the Functional Deficits Clinical Scale is associated with differences in Total ICD scores.

*Hypothesis 24 – Pain Sensitivity.*

It was hypothesized that there would be a significant, positive correlation between the stress moderator score for pain sensitivity, as measured by the MBMD, and total score on the ICD.  The Pearson correlation coefficient on this scale was both positive and significant ($r$=.31, $p$<.01, one-tailed). This illustrates a coefficient of determination ($r^2$=.10) indicating that 10% of the variability in the Pain Sensitivity Clinical Scale was attributable to differences in Total ICD scores.

*Hypothesis 25 – Social Isolation.*

It was hypothesized that there would be a significant, positive correlation between the stress moderator score for social isolation, as measured by the MBMD, and total score on the ICD.  Study findings for this clinical scale show a significant, positive Pearson correlation coefficient ($r$=.36, $p$<.01, one-tailed). This illustrates a coefficient of determination ($r^2$=.13) indicating that 13% of the variability in the Social Isolation Clinical Scale was attributable to differences in Total ICD scores.

*Hypothesis 26 – Future Pessimism.*

It was hypothesized that there would be a significant, positive correlation between the stress moderator score for future pessimism, as measured by the MBMD, and total score on the ICD.  The results demonstrate a significant, positive Pearson correlation coefficient ($r$=.31, $p$<.01, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2$=.10) indicating that 10% of the variability in the Future Pessimism

Clinical Scale for which an individual met criteria was attributable to differences in Total

ICD scores.

Hypothesis 27 – Spiritual Absence.

It was hypothesized that there would be a significant, positive correlation between

the stress moderator score for spiritual absence, as measured by the MBMD, and total

score on the ICD. The results demonstrate that there was no significant correlation (r=-

.01, p=.47, one-tailed) on this clinical scale.

Treatment Prognostics

The correlations for the Treatment Prognostics Domain and its clinical scales are

described in Table 11 and are discussed separately below.

Table 11

Correlation of the five Treatment Prognostic Scores to Total ICD Score

| Scale | ICD Total | Sig. (1-tailed) | $r^2$ |
|---|---|---|---|
| Intervational Fragility | .35** | p<.01 | .12 |
| Medication Abuse | .21** | p<.01 | .04 |
| Information Discomfort | -.02 | p=.39 | ---- |
| Utilization Excess | .36** | p<.01 | .13 |
| Problematic Compliance | -.09 | p=.14 | ---- |

** Correlation is significant at the 0.01 level (1-tailed)
* Correlation is significant at the 0.05 level (1-tailed)

*Hypothesis 28 – Interventional Fragility.*

It was hypothesized that there would be a significant, positive correlation between the treatment prognostic score for interventional fragility, as measured by the MBMD, and total score on the ICD.  The results demonstrate a significant, positive Pearson correlation coefficient (r=.35, p<.01, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2$=.12) indicating that 12% of the variability in the Interventional Fragility Clinical Scale is attributable to differences in Total ICD scores.

*Hypothesis 29 – Medication Abuse.*

It was hypothesized that there would be a significant, positive correlation between the treatment prognostic score for medication abuse, as measured by the MBMD, and total score on the ICD.  The results for this clinical scale also produced a significant, positive Pearson correlation coefficient (r=.21, p<.01, one-tailed). This illustrates a coefficient of determination ($r^2$=.04) indicating that 4% of the variability in the Medication Abuse Clinical Scale is associated with differences in Total ICD scores.

*Hypothesis 30 – Information Discomfort.*

It was hypothesized that there would be a significant, positive correlation between the treatment prognostic score for information discomfort, as measured by the MBMD, and total score on the ICD. The results demonstrate that there was no significant correlation (r=-.02, p=.39, one-tailed) on this clinical scale.

*Hypothesis 31 – Utilization Excess.*

It was hypothesized that there would be a significant, positive correlation between the treatment prognostic score for utilization excess, as measured by the MBMD, and total score on the ICD.  The Pearson correlation coefficient for this clinical scale was

both positive and significant (r=.36, p<.01, one-tailed). This illustrates a coefficient of

determination ($r^2$=.13) indicating that 13% of the variability in the Utilization Excess

Clinical Scale was attributable to differences in Total ICD scores.

*Hypothesis 32 – Problematic Compliance.*

It was hypothesized that there would be a significant, positive correlation between

the treatment prognostic score for problematic compliance, as measured by the MBMD,

and total score on the ICD. The results demonstrate that there was no significant

correlation (r=-.09, p=.14, one-tailed) on this clinical scale.

*Management Guide*

The correlations for the Management Guide Domain and its clinical scales are

described in Table 12 and are discussed separately below.

Table 12

*Correlation of the two Management Guide Scores to Total ICD Score*

| Scale | ICD Total | Sig. (1-tailed) | $r^2$ |
|---|---|---|---|
| Adjustment Difficulty | .13 | p=.06 | ---- |
| Psychiatric Referral | .40[**] | p<.01 | .16 |

[**] Correlation is significant at the 0.01 level (1-tailed)
[*] Correlation is significant at the 0.05 level (1-tailed)

*Hypothesis 33 – Adjustment Difficulties.*

It was hypothesized that there would be a significant, positive correlation between the management guide score for adjustment difficulties, as measured by the MBMD, and total score on the ICD. The results demonstrate that there was no significant correlation ($r=.13$, $p=.06$, one-tailed) on this clinical scale.

*Hypothesis  34 – Psychiatric Referral.*

It was hypothesized that there would be a significant, positive correlation between the management guide score for psychiatric referral, as measured by the MBMD, and total score on the ICD.  The results demonstrate a significant, positive Pearson correlation coefficient ($r=.40$, $p<.01$, one-tailed) on this clinical scale. This illustrates a coefficient of determination ($r^2=.16$) indicating that 16% of the variability in the Psychiatric Referral Clinical Scale is attributable to differences in Total ICD scores.

Descriptive Statistics are summarized below in Table 13.

Table 13

*Descriptive Statistics Summary*

| MBMD Clincial Scales | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| MBMD Age | 19 | 78 | 37.92 | 14.991 |
| NgHlthHabAlcohol | 1 | 3 | 1.15 | .411 |
| NgHlthHabDrug | 1 | 3 | 1.22 | .546 |
| NgHlthHabEating | 1 | 3 | 1.62 | .645 |
| NgHlthHabCaffeine | 1 | 3 | 1.34 | .667 |
| NgHlthHabInactivity | 1 | 3 | 2.02 | .735 |
| NgHlthHabSmoking | 1 | 3 | 1.45 | .694 |
| Anxiety Tension | 5 | 102 | 50.56 | 25.656 |
| Depression | 5 | 105 | 44.96 | 29.886 |
| Emotional Laability | 5 | 90 | 51.98 | 19.628 |
| Guardedness | 10 | 92 | 53.50 | 18.389 |
| Introversive | 0 | 110 | 45.96 | 30.512 |
| Inhibited | 0 | 115 | 48.35 | 27.626 |
| Dejected | 0 | 115 | 36.01 | 34.833 |
| Cooperative | 5 | 115 | 56.59 | 25.547 |
| Sociable | 0 | 93 | 57.87 | 20.506 |
| Confident | 0 | 90 | 53.07 | 21.337 |
| Nonconforming | 5 | 88 | 48.52 | 19.898 |
| Forceful | 5 | 77 | 44.78 | 19.104 |
| Respectful | 0 | 102 | 49.53 | 24.534 |
| Oppositional | 10 | 112 | 57.50 | 21.762 |
| Denigrated | 0 | 115 | 57.62 | 27.414 |
| Illness Apprehension | 10 | 109 | 51.43 | 23.411 |
| Functional Deficits | 5 | 105 | 50.73 | 24.972 |
| Pain Sensitivity | 10 | 115 | 52.54 | 25.911 |
| Social Isolation | 0 | 98 | 57.51 | 22.211 |
| Future Pessimism | 5 | 100 | 42.93 | 24.011 |
| Spiritual Absence | 0 | 115 | 43.99 | 32.663 |
| Interventional Fragility | 0 | 95 | 45.24 | 19.778 |
| Medication Abuse | 0 | 105 | 42.59 | 23.922 |
| Information Discomfort | 0 | 105 | 49.47 | 32.390 |
| Utilization Excess | 10 | 105 | 59.29 | 22.840 |
| Problematic Compliance | 4 | 105 | 64.03 | 23.507 |
| Adjustment Difficulties | 15 | 110 | 69.12 | 18.537 |
| Psych Referral | 5 | 115 | 48.66 | 24.010 |
| ICD Total | 79 | 291 | 161.04 | 39.355 |

Discussion

*Summary and Integration of Major Findings*

The focus of this study was to determine 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 include the clinical scale domains of negative health habits, psychiatric indications, coping styles, stress moderators, treatment prognostics, and management guide. In addition, this study set out to examine further the psychometric properties of the ICD. This study produced significant, positive findings supporting these objectives. The following summarizes significant findings and discusses their implications in the context of current research and literature.

From an application perspective one of the primary reasons for doing this study was to further efforts in developing a tool that supports a biopsychosocial model of patient care. It has become apparent that in order for patient outcomes to improve further, psychologists and physicians need to work together in an integrated fashion. Cognitive theory and research has indicated that cognitive distortions contribute to psychological and behavioral disorders (Beck et al., 2004; Millon & Davis, 1996), and these same patients often present in medical settings with physical complaints. Studies have shown that complaints brought by patients to their primary care physicians are generally not symptoms of biological diseases (Kroenke & Manglesdorff, 1989).

Setting the stage for the use of the ICD in a biopsychosocial model, this study demonstrated that the ICD has strong internal consistency for measuring cognitive distortions. Cronbach's analysis of the ICD survey items indicated strong homogeneity

of item content (Cronbach's Alpha = .967).   This level of homogeneity was also found

by Rosenfield in his study of cognitive distortion and psychological disorders across

diagnostic axes (Rosenfield, 2004).

From a global perspective, the ICD was proven to be an excellent measure for

uncovering relationships between distorted thinking and psychological and behavioral

health risks as measured by the MBMD.  Of the 34 hypotheses in this study, 29

hypotheses demonstrated significant, positive findings. Upon examination of study

results, it is clear that most of the hypotheses are best examined and discussed in the

context of their MBMD clinical domain category as opposed to individual clinical scales.

The following discusses the results by clinical scale domain:

*Coping Styles*

The 11 hypothesis that were derived from the 11 clinical scales that make up the

MBMD Coping Style domain include the following: Introversive, Inhibited, Dejected,

Cooperative, Sociable, Confident, Nonconforming, Forceful, Respectful, Oppositional,

and Denigrated. Definitions of these coping styles can be found in Appendix G.  All 11

clinical scales were found to correlate with the ICD, 10 at the .01 level and one at the .05

level. All 11 hypotheses in this domain were supported by study results. These finding

suggest several possibilities that may have implications for the ways in which health

psychologists and physicians work together and for improving patient outcomes.  These

implications will be discussed in the next section.

In regard to the most compelling findings associated with this domain, the two

with the strongest correlations are inhibited coping style and dejected coping style.  The

loading statements on these two clinical scales are clearly enveloped in the ICD subscales

identified by Yurica and DiTomasso (Yurica, 2002).  For example, the loading statement

for inhibited coping style, "I guess I've always been a fearful and inhibited person."

(Millon, 2001), falls under Yorica and DiTomasso's externalization of self-worth and

fortune-telling subscales. These subscales' loading questions include, "I believe others

think about me in a negative way.", and "I believe my negative forecasts about my future

will come true." The underlying theme here is psychopathology as it relates to cognitive

theory.  In other words, negative patterns of thinking, feeling, and relating to others may

be affected or be enveloped in cognitive distortions.  Conversely, people who function

better have fewer distortions.

In summary, on the coping styles scales, differences in scores on these scales

were arrtibutable to differences in scores on the ICD.  This means that differences in

levels of distorted thinking are associated with differences in levels of psychopathology.

*Negative Health Habits*

Subsequent categorical hypotheses, $H_{12}$ through $H_{17}$, predicted that people, who

had a Likely negative health habit score, as measured by the MBMD, will have

significantly higher ICD total score than those people who have an Unlikely negative

health habit score. The possible reason for this may be due to the categorical nature of

this domain. $H_{12}$, the first negative health habit, was alcohol and its overall F test (F

$(2,144) = .67$, $p=.51$) was not significant. Few participants saw themselves as having a

drinking problem and there was little variation between participants regardless of their

Total ICD score.  Alternatively, people who do drink to the point of its being a problem,

according to their self-report, do not necessarily have distorted thinking.  On the other

hand, the overall F test for each of H13 was significant.  This may be due to these

negative health habits being reactive behaviors to negative life events or stress. People will often resort to the use of drugs, over eating, increasing use of caffeine, becoming less active, and smoking more when they are depressed and anxious.

Cognitive distortions have been shown to correlate with depression (e.g., Beck, Ward, Mendelson, Mock& Erdbaugh, 1961; Butler & Beck, 2000; Hollen & Kendall, 1980; Rosenfield, 2004, Yurica, 2002) and anxiety (Ross, Gottefredson, Christensen, & Weaver, 1986; Yourica, 2002). It is well known that successful, long term cessation of these negative health habits such as those mentioned above, require treatment of the underlying psychological pathology.

Post hoc Tukey tests for the negative health habit hypotheses examined the differences between groups. In $H_{13}$ through $H_{17}$, the Tukey test revealed there was a significant difference between those subjects who were categorized as unlikely to have a negative health habit and those who were either possibly or likely to have a negative health habit problem. This again is likely due to those who are unlikely to have a particular negative health habit, have significantly few cognitive distortions than those who either possibly or likely have a negative health habit problem. Caution is necessary when making this interpretation because of the risk of a Type I error resulting from unequal cell sizes. Research conducted by Rosenfield (2004) demonstrated that individuals meeting criteria for any diagnosis (Base Rate of 75 or greater on any MCMI-III Axis scale[s]) on Axis I clinical disorders or on Axis II Personality Disorders reported a higher frequency of cognitive distortions, as measured by the ICD, than those who were free of diagnosable psychological disorders. This research helps to frame the significant

finding that people who are struggling with negative health habits also have higher

frequency of cognitive distortions.

<center>*Psychiatric Indications*</center>

There was significant support for all the hypotheses derived from the MBMD

domain Psychiatric Indications.  The four hypotheses were supported because there were

significant, positive Pearson correlation coefficients on MBMD psychiatric indication

scales: Participants who reported they suffer from anxiety-tension and depression also

demonstrated, at a significant level, that they also tend to cognitively distort. This

indicates that much of the variance ($r^2$) in Psychiatric Indications domain scores was

attributable to the frequency of cognitive distortions.

These findings offer support for Kendall's et al.(1989) research on the effect of

referent speech on psychopathology, the cognitive model of emotional disorders (Beck et

al., 1979),  and Yurica and DiTomasso's (Yurica, 2002) ICD development research. The

implication of this research is that cognitive distortions underlie a range of psychological

disorders. Successful treatment of these emotional disorders, as described by Judith Beck

(1998), involves cognitive restructuring through the identification, evaluation, and

response to a patient's cognitive distortions and dysfunctional beliefs. The ICD is well

suited to facilitate this task.

<center>*Stress Moderators*</center>

As predicted, the Pearson correlation coefficients for $H_{22}$ through $H_{26}$ revealed

that participants with a greater number of stress moderators such as Illness Apprehension,

Functional Deficits, Pain Sensitivity, Social Isolation, and Future Pessimism engage in

more cognitive distortions than those who score lower on these stress moderators. This

means 4% to 13% of the variance in the ICD total score was attributable to the clinical scales included in the Stress Moderator domain.

This could be interpreted as further validation for the need to use instruments such as the ICD in medical settings, utilized potentially as a trigger mechanism for making appropriate mental health referrals. The benefits of making timely and appropriate referrals for mental health is supported by research previously described in the literature review. Drawing on the theoretical assumption that individuals with fewer cognitive distortions are less likely to become depressed in response to negative events, Whisman et al. (1991) noted that depressed patients who receive CT have demonstrated lower rates of relapse. Additional benefits can be further postulated because lower rates of relapse result in lower utilization of services and lower health care costs.

The Stress Moderator hypothesis ($H_{27}$), Spiritual Absence was not supported. It was predicted that there would be a positive correlation between spiritual absence, as measured by the MBMD, and ICD total score. It seems Spiritual Absence is not a good indicator for distorted thinking.

*Treatment Prognostics*

The study found significant support for 3 of the 5 Treatment Prognostic clinical scale hypotheses. Support was found for $H_{28}$, Interventional Fragility; $H_{29}$, Medication Abuse; and $H_{31}$, Utilization Excess. This illustrates coefficients of determination ($r^2$) of 12%, 4%, 13%, respectively  for Interventional Fragility; Medication Abuse; and Utilization Excess. This indicates that the variability in the clinical scales for which an individual met diagnostic criteria was attributable to differences in ICD total scores. This means that individuals who scored high on the clinical scales engaged in more frequent

cognitive distortion than individuals who scored low on the clinical scales. These findings also suggest that a relatively large proportion of the variance is unaccounted in some instances.

These results are consistent with what the authors of the DSM-IV-TR (American Psychiatric Association, 2000) have asserted. The most recent editions of the DSM have slowly shifted in drawing strong connections between psychological factors and medical conditions. According to the DSM-IV-TR, psychological factors can influence the course of a general medical condition and may even interfere with treatment of a general medical condition (American Psychiatric Association, 2000). From their research, Millon and Davis (1996) go further to say that psychological factors can and should be identified as health risks. In many instances, the effect of psychological factors and the ways in which they may exacerbate a general medical condition has been quantified. For example, underlying depression and anxiety in a medical patients who have advanced diabetes may result in a poor treatment outcome they not take their medication as directed. Patients such as these may score high on the MBMD clinical scale medication abuse because they are of the belief that the pain they are experiencing in their feet will subside only if they take more than the prescribed amount of their medication. This is likely to correlate with the ICD factor, magnification. The distortions may include the patients focusing on their discomfort and exaggerating the duration and intensity of the pain.

The study did not find correlational evidence to support $H_{30}$, Information Discomfort and $H_{32}$, Problematic Compliance.

*Management Guides*

There was no support for $H_{33}$ which stated there would be a significant, positive correlation between the Management Guide score for Adjustment Difficulties, as measured by the MBMD, and total score on the ICD.

The last hypothesis was supported. The Pearson correlation coefficient for $H^{34}$ revealed that participants who scored high on the clinical scale Psychiatric Referral, as measured by the MBMD, also had a high total score on the ICD. This illustrates a coefficient of determination ($r2=.16$), indicating that 16% of the variability in the clinical scale for which an individual met diagnostic criteria was attributable to differences in the Total ICD scores. The theme is clear; individuals who score high on the clinical scales engage in more frequent cognitive distortion than individuals who score low on the clinical scales.

It seems apparent upon examination of the MBMD loading statements for this clinical scale why the ICD correlates well. Psychiatric Referral loading statements include: "The pain I'm in has made my life feel very hopeless" and "I start feeling crazy when medical problems turn out badly for me." The corresponding ICD factor which likely correlates significantly to the Psychiatric Referral clinical scale is Fortune-Telling. Yurica and DiTomasso (Yurica, 2002) found evidence that people who engage in fortune telling display a strong tendency to predict a negative future in a number of contexts. As with Psychiatric Referral clinical scale, Yurica and DiTomasso (Yurica, 2002) also found a tendency to focus on the negative aspects of a situation or event, disregarding other potentially relevant information. As the MBMD clinical scale's name indicates, a

psychiatric or mental health referral is recommended for patients with high scores; this would also be true for people with a high ICD total score.

*Implications of the Findings*

The main overall theme of these findings is that the more likely the patients engage in cognitive distortions the more likely they are to engage in negative psychological and behavioral risk factors as defined by the MBMD. The implication of these findings in the simplest and most specific terms is that the more likely that these persons engage in cognitive distortion the more likely they will be unhappy and dissatisfied with themselves and their life situations.  The results of this study revealed significant findings for 29 of the 34 hypotheses. This study suggests taking this scenario one step further, the more a person engages in distorted ways of thinking, the more likely they are to experience psychological and behavioral problems. These problems are likely to exacerbate or not to resolve at all.

At the time of this study there were no self-report inventories of cognitive distortions for use with adult populations. In the practice of cognitive-behavioral therapy (CBT), it is likely to become invaluable to have a tool that can assist the therapist in specifically identifying pathological levels of cognitive distortions in their patients. Patient outcomes can only be advanced through the use of a tool that can identify and can be used to track changes in distortions during the treatment process. Combining the ICD with regular use of an automatic thought record (ATR) seems to be a likely and effective treatment tool combination.  The ICD would provide for baseline information and periodically provide follow-up information on changes in the person's distortions. The ATR would be used in a focused manner by way of information provided by the ICD.

The five hypotheses that did not show significance seemed to have statistical phenomenon that caused the failure of a specific clinical scale to correlate with total ICD scores. In Millon's et al (2001) own research, the convergent correlations between MBMD scales and standard measures were nearly always moderate to high (.50 to .87), with the exception of Problematic Compliance (.38). The explanation by Millon et al. (2001), for this poor correlational performance is that patient behavior varies across individuals.

*Limitation of the Study*

This study did not allow for a clinical interview. A clinical interview would afford the clinician the opportunity to incorporate his or her experience and overall assessment of the patient into making a well-informed and tailored treatment plan. In addition, the ICD is a relatively new instrument and convergent validity research comparing the ICD to other existing cognitive distortion scales has yet to be done.

Both the ICD and MBMD are self-report instruments and, as a result, are susceptible to the effect of participants' current affective states on responses, the reactive nature of such instruments, idiosyncratic differences in the way participants interpret individual items, and the influences of self-presentation and social desirability (Kazdin, 1998). Finally, there were a large number of correlations conducted in this study and the possibility of finding a significant association due to chance may have been increased.

*Future Directions*

Having the ability to identify distortions of thought quickly has wide reaching implications for physicians and psychologists, including the way in which patient care is provided in a medical practice setting. The ICD is an instrument that has been developed

to accomplish this task and does it well as evidenced by this study. The relationship between distortions of thought identified by the ICD and the MBMD clinical scales creates an opportunity for health psychologists to integrate their services into a medical practice, creating a true biopsychosocial model of patient care. In an effort to further develop the ICD for use in a medical practice setting, it seems important to further develop the instrument by increasing its sensitivity to the areas identified by the MBMD that did not correlate well with the ICD. It may be useful to examine more closely how people distort their thinking related to the use of alcohol, their information discomfort, compliance issues, and risk of treatment complications (Adjustment Difficulties). Supporting research has demonstrated how these issues often befuddle physicians. The ICD would provide health psychologists and physicians with improved insight into these problem areas. That provision would facilitate improved service, therapeutic intervention and planning and overall greater satisfaction for both patients and providers.

Development of a short form of the instrument may be useful for use in primary care settings. This may be accomplished if some of the redundancies are eliminated. Yurica and DiTomasso (Yurica, 2002) acknowledged that the time needed to complete the ICD limits its utility as a tool for assessing changes in cognitive distortions for research purposes.

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## Appendix A

### Copy of ICD

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# ICD

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

Date:

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**ICD Form A**

Name: ___(NO NAME)_____          Age:_____ Sex:_____

**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 answer.** There are no right or wrong answers. Please respond to each statement as honestly as possible. **Please mark every item.**

| | |
|---|---|
| Circle N if you **never** think or feel this way. | **How to Mark Your Responses** |
| Circle R if you **rarely** think or feel this way. | Be certain to circle the letter your choose **completely**, like this: |
| Circle S if you **sometimes** think or feel this way. | N  R  S Ⓞ A |
| Circle O if you **often** think or feel this way. | If you wish to change a response, mark an X through it and circle |
| Circle A if you **always** think or feel this way. | your new choice, like this: ⓍⓇ S  O  A |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 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 |

## ICD Form 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 shoulds, 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 B

## Copy of MBMD

| | | | |
|---|---|---|---|
| 1. T F | 46. T F | 91. T F | 136. T F |
| 2. T F | 47. T F | 92. T F | 137. T F |
| 3. T F | 48. T F | 93. T F | 138. T F |
| 4. T F | 49. T F | 94. T F | 139. T F |
| 5. T F | 50. T F | 95. T F | 140. T F |
| 6. T F | 51. T F | 96. T F | 141. T F |
| 7. T F | 52. T F | 97. T F | 142. T F |
| 8. T F | 53. T F | 98. T F | 143. T F |
| 9. T F | 54. T F | 99. T F | 144. T F |
| 10. T F | 55. T F | 100. T F | 145. T F |
| 11. T F | 56. T F | 101. T F | 146. T F |
| 12. T F | 57. T F | 102. T F | 147. T F |
| 13. T F | 58. T F | 103. T F | 148. T F |
| 14. T F | 59. T F | 104. T F | 149. T F |
| 15. T F | 60. T F | 105. T F | 150. T F |
| 16. T F | 61. T F | 106. T F | 151. T F |
| 17. T F | 62. T F | 107. T F | 152. T F |
| 18. T F | 63. T F | 108. T F | 153. T F |
| 19. T F | 64. T F | 109. T F | 154. T F |
| 20. T F | 65. T F | 110. T F | 155. T F |
| 21. T F | 66. T F | 111. T F | 156. T F |
| 22. T F | 67. T F | 112. T F | 157. T F |
| 23. T F | 68. T F | 113. T F | 158. T F |
| 24. T F | 69. T F | 114. T F | 159. T F |
| 25. T F | 70. T F | 115. T F | 160. T F |
| 26. T F | 71. T F | 116. T F | 161. T F |
| 27. T F | 72. T F | 117. T F | 162. T F |
| 28. T F | 73. T F | 118. T F | 163. T F |
| 29. T F | 74. T F | 119. T F | 164. T F |
| 30. T F | 75. T F | 120. T F | 165. T F |
| 31. T F | 76. T F | 121. T F | |
| 32. T F | 77. T F | 122. T F | |
| 33. T F | 78. T F | 123. T F | |
| 34. T F | 79. T F | 124. T F | |
| 35. T F | 80. T F | 125. T F | |
| 36. T F | 81. T F | 126. T F | |
| 37. T F | 82. T F | 127. T F | |
| 38. T F | 83. T F | 128. T F | |
| 39. T F | 84. T F | 129. T F | |
| 40. T F | 85. T F | 130. T F | |
| 41. T F | 86. T F | 131. T F | |
| 42. T F | 87. T F | 132. T F | |
| 43. T F | 88. T F | 133. T F | |
| 44. T F | 89. T F | 134. T F | |
| 45. T F | 90. T F | 135. T F | |

# MBMD™

# TEST BOOKLET

# MILLON™ BEHAVIORAL MEDICINE DIAGNOSTIC

Theodore Millon, PhD, DSc, Michael Antoni, PhD, Carrie Millon, PhD,
Sarah Minor, PhD, and Seth Grossman, PsyD

**PEARSON**
**Assessments**

Product Number
51931

TEST DIRECTIONS:

Below are statements that describe feelings and attitudes that patients sometimes have. Read each statement carefully and decide if it is true or false for you. Then fill in the T or F on the separate answer sheet to record your response.

**Be as honest and as serious as you can.**

Use a No. 2 pencil and make a heavy, dark mark when filling in the circles. If you make a mistake or change your mind, please erase the mark fully and then fill in the correct circle.

1. I feel very tense when I think about the day's events.

2. I am not a very spiritual person.

3. I get extremely anxious when I don't know what the doctors are going to do to me.

4. I am a dramatic kind of person.

5. Sometimes I can't remember what medications to take and when to take them.

6. I often get confused about what is happening to me.

7. I can no longer do things I enjoyed doing in the past.

8. I've felt sad much of my life.

9. The idea of being left alone in life really frightens me.

10. Sometimes I take medications that were prescribed for others on the chance that they'll help me.

11. I wish other people were more accepting of me.

12. I can get nasty with people who deserve it.

13. My best years are behind me.

14. I feel jumpy and under strain, but I don't know why.

15. I get great comfort from my religious beliefs.

16. I begin to cry when the smallest things go wrong.

17. I seem to fit in right away with any group of people I meet.

18. I like to follow instructions and do what others expect of me.

19. Most people wouldn't care much if I were sick.

20. Medical instruments really frighten me.


21. Loss of memory has been a big problem for me.

22. I can't move around and do things as well as I could in the past.

23. I want my doctor to review with me the results of all my medical tests.

24. I've found that this society is too hard on people who don't conform.

25. I've felt all alone for a very long time now.


26. I'll stop anyone who tries to boss me around.

27. I would much rather follow someone than be the leader.

28. I get very anxious when I think about my medical problems.

29. I deserve many of the misfortunes I've suffered.

30. I think things will get much worse in the coming months.


31. I can't take care of myself as well as I used to.

32. I try to learn as much as I can about the treatments available for my medical condition.

33. Faith and prayer always get me through my troubles.

34. I have a lot of confidence in myself.

35. I'm trying to be as open as I can in my responses to these questions.


36. I protect myself by not letting people know much about my life.

37. I guess I've always been a fearful and inhibited person.

38. If you don't have something good to say about yourself, you should keep quiet.

39. I would do anything to stop the pain I feel.

40. I seem to need a lot of advice in order to get things done.


41. If I have to go through another medical procedure, I think I'll just go crazy.

42. My health seems to be failing faster than that of most people my age.

43. Life will never be the same again for me.

44. No matter what, seeing a doctor is reassuring.

45. I rarely find the time to exercise.

46. I feel so jittery and restless that I'm worn out at night.
47. I've always preferred to have a quiet and inactive life.
48. I have a habit of making my problems sound worse than they really are.
49. I have been having serious thoughts about suicide.
50. I like to arrange things down to the last detail.

51. There's little emotional support within my family.
52. I have always had a talent for being successful.
53. I have told lies to my family to conceal my use of drugs.
54. Very few people appreciate just how hard my life really is.
55. I seem to be losing my ability to concentrate.

56. Answering questions like these helps me take a good honest look at things in my life.
57. I watch out for people trying to cheat me.
58. The pain I'm in has made my life feel very hopeless.
59. In this world you either push or get shoved.
60. I'm very erratic, changing my feelings all the time.

61. When people are bossy, I usually do the opposite of what they want.
62. I've had nightmares about medical procedures I may have to endure.
63. I worry a lot that the people I depend on will leave me.
64. I'm my own worst enemy.
65. I sometimes exaggerate how poorly I am feeling.

66. For some unknown reason, I suddenly get very panicky.
67. My emotions don't seem to be as strong as other people's.
68. It makes me very uncomfortable when other people know about my problems.
69. Physical pain is a big part of my life.
70. I am constantly worried about my health.

71. It is good to have a routine for doing things in order to avoid mistakes.
72. There is someone close to me who truly understands my feelings.
73. Many people respect and envy me.
74. Taking drugs has been a regular part of my social life.
75. I believe something is wrong with my head.

76. Most people in my life eventually disappoint me.

77. I feel particularly resentful when I am refused medical benefits I know I am entitled to.

78. It's all right to bend the law as long as you don't break it.

79. I never let anyone get the better of me.

80. I know from the past that good things don't last.

81. I can handle the worst medical news about myself, no matter how upsetting it may be.

82. I am afraid that I may suddenly die from an illness.

83. I am quickly losing hope that I will ever regain my health.

84. I make sure that I'm on time for all my doctor's appointments.

85. Pain makes it very difficult for me to work now.

86. I have found very few things in life to be pleasurable.

87. I have many very good and close friends.

88. I always finish my work before I take time out for leisure.

89. I have friends who will listen to any problem I have.

90. Everything I try comes easily to me.

91. I'm making myself seem healthier in my responses here than I really am.

92. My life has always gone from bad to worse.

93. I think it's best not to trust anyone.

94. Pain is the worst part of my medical condition.

95. I often resent doing things that others expect of me.

96. I am mistreated most by close friends and relatives.

97. I quickly consult my doctor whenever I have new symptoms.

98. I'm on edge a lot lately.

99. I am never alone as long as God is with me.

100. I think I'm a very sociable and outgoing person.

101. It is always best to follow the rules that those in authority have made.

102. A lot of my answers on this test have been affected by my current bad mood.

103. I sometimes take medications that are prescribed for other people.

104. I often set myself up to fail.

105. I feel guilty most of the time.

106. I flew across the Atlantic more than 30 times last year.

107. My feelings toward my relatives often swing back and forth from love to hate.

108. I want my doctors to be as detailed as possible in telling me about my medical problems.

109. I don't think I'll live as long as I should.

110. I make my life worse than it has to be.


111. I smoke about a pack of cigarettes a day.

112. I've never had as much interest in sex as most people my age.

113. I'm too embarrassed to admit my problems as frankly as I should.

114. I can charm people into doing almost anything I want.

115. I've been overweight ever since I was a child.


116. If I don't get relief from medicine, I may increase the dosage on my own.

117. In the past year, I've really gone downhill mentally.

118. I think I am making my life look worse than it really is by my responses here.

119. I spend much of my time brooding about things.

120. Too many rules get in the way of people doing what they want to do.


121. No one needs to know my business.

122. I've always felt that most people think poorly of me.

123. I'm considered a tough and unsentimental person.

124. I was on the front cover of several magazines recently.

125. I get very annoyed when others put pressure on me.


126. My body is constantly giving me worrisome signals.

127. It is difficult for me to get through the day without a few drinks.

128. I never put off seeing the doctor if I feel I need to.

129. Being in touch with my spiritual self helps me deal with life's burdens.

130. I often feel sad and unloved.


131. I start feeling crazy when medical problems turn out badly for me.

132. I am holding back when I respond to many of these statements.

133. I feel entitled to all my sick days each year.

134. I'd rather not know the details of an illness I might have.

135. I get very irritable if I haven't had a cup of coffee for a few hours.

136. The quality of my life has gotten much worse because of my illness.

137. I rarely feel a sense of joy these days.

138. I usually do what I want without worrying about how it affects others

139. I'm a yo-yo dieter; my weight goes up and down.

140. My head often hurts so much that I need to take time off from work.

141. This is a very lonely world.

142. I've tried to quit smoking many times, but I always start again.

143. I would change my lifestyle on my doctor's advice.

144. Without God in my life, I could never get through a serious illness.

145. My pain is on my mind constantly.

146. I always overeat when I'm depressed or under stress.

147. My future looks like it will be full of problems and pain.

148. It's okay to take advantage of gray areas in the law.

149. I've tried exercise programs, but I just can't seem to stick with them.

150. I'm unable to organize my life the way I want.

151. Members of my family have complained recently about my drinking.

152. I really don't understand human feelings like others do.

153. I need plenty of caffeine to get me through the day.

154. I almost always put other people's needs above my own.

155. I often feel overwhelmed by minor responsibilities.

156. I've lost interest in things that I used to find pleasurable.

157. I now need to follow routines so that I don't get confused.

158. My medical condition has made daily tasks much more difficult.

159. I know I should exercise, but I just can't get started.

160. I cannot count on anyone to support me during times of illness.

161. I feel very depressed.

162. I am a very emotional person.

163. I like to flirt with members of the opposite sex.

164. I get irritable if I go too long without a cigarette.

165. I have no deep religious beliefs.

Appendix C

Study Sites

Virtua Health – Tatem Brown Family Practice

(Primary site – West Jersey Family Practice Residency)

2225 Evesham Road, Suite 101

Voorhees, New Jersey, 08043


Virtua Health – Family Medicine Center at Lumberton

(Satellite – West Jersey Family Practice Residency)

1636 Route 38 East

Mount Holly, New Jersey, 08060

Appendix D

Brief Information Sheet

1   Have you ever received mental health treatment before?                    Yes    No

2   Have you ever been hospitalized for mental health issues?                 Yes    No

3   Are you currently taking medications for a mental health problem?     Yes    No

4   If yes, which type of medication

    (Circle type or types of medication you are taking)

a. Anti-depressant      b.  Anti-anxiety        c.  Mood Stabilizer

5   If yes, circle the sentence that best describes your compliance with taking your

    medication:

        a.   I always take my medication as directed.
        b.   I may miss a day or two per week in taking my medication.
        c.   I don't take my medication more often than I do take my medication.
        d.   I rarely take my medication as directed.

Appendix E

MBMD Domains and Scales Summary

| Response Patterns | | No. of Items |
|---|---|---|
| X | Disclosure | 6 |
| Y | Desirability | 11 |
| Z | Debasement | 10 |

| Negative Health Habits | | |
|---|---|---|
| N | Alcohol | 2 |
| O | Drug | 2 |
| P | Eating | 3 |
| Q | 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

Management Guides

Appendix F

ICD Definition of Terms

Inventory of Cognitive Distortions - the 11 theoretical factors or cognitive distortions, as

defined verbatim by Yurica (2002, p. 60), are comprised of the following:

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, 1980, 1989, 1999).

3.      Magnification: The tendency to exaggerate or magnify either the positive or negative

consequences of some personal trait, event, or circumstance (Burns, 1980, 1989, 1999).

4.      Labeling: The cognitive process of labeling oneself using derogatory names (Burns,

1980, 1989, 1999; Freeman & Dewolf, 1992; Freeman & Oster, 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 (Freeman &

Dewolf, 1992; Freeman & Oster, 1999).

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

(Freeman, & DeWolf 1992; Freeman & Oster, 1999).

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, 1980, 1989,

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, 1980, 1989, 1999).

9.    Minimization: Refers to the process of minimizing or discounting the importance of

some event, trait, or circumstance (Burns, 1980, 1989, 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, 1980, 1989, 1999).

11.    Emotional Reasoning and Decision-Making: The tendency to rely on emotions to

make decisions (Yurica, 2002).

Appendix G

MBMD Definition of Terms

Millon Behavioral Medicine Diagnostic – seven domains made up of 38 clinical scales, as defined verbatim by Millon (2001, p. 10), are comprised of the following:

Response Patterns

1. Disclosure: is 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 the Client's results may have been affected by his/her desire to appear socially attractive, morally virtuous, or emotionally well-composed. Sample item "I have always had a talent for being successful."

3. Debasement: assess the Client's tendency to present many minor and major symptoms, sensations, and experiences in his/her communication with the healthcare provider. In general, this scale is the opposite of the Desirability clinical scale. Sample item "I sometimes exaggerate how poorly I am feeling."

Negative Health Habits: lifestyle behaviors that patients exhibit that may exacerbate their medical problems or undermine efforts to treat their 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: Is 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 the patient engages in physical exercise on a regular basis. Sample item "I rarely find time to exercise."

9. Smoking: Notes whether the patient smokes tabacco-containing products on a regular basis. Sample item "I've tried to quit smoking many times, but I always start again."

Psychiatric Indications: Reasons 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 scores on the Aniety-Tension 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. In general, these patients 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 relatives 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: are designed to assess characteristics that reflect the cognitive, behavioral, and interpersonal strategies patients use to acquire reinforcers and to avoid pain and discomfort in medical settings and in other spheres of their lives. They are described specifically as they relate to patients' transactions 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 or 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 mined. 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: Stress moderators 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 patients' 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 patients' 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 Client'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: This domain is designed to identify behavioral and attitudinal aspects of a patient's life 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 decompesation 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: These scales integrate and summarize a patient's 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 feeling crazy when medical problems turn out badly for me."

Appendix H

Letter of Agreement to Participate in Study

Dear Volunteers,

Thank you for your interest in this study of thoughts, feelings and behaviors.   The study is being done by Jeffrey Uhl, MBA, MEd, a doctoral candidate in clinical psychology, and Robert A. DiTomasso, PhD, ABPP, Professor and Chairman of the Psychology Department at the Philadelphia College of Osteopathic Medicine.  Being in this study will involve filling out three paper and pencil forms.  These forms should take about 45 minutes to complete.

If you decide to become part of this study, please tell the study coordinator. Strict privacy will be kept throughout the research study.  This means that no one will be able to connect your name with the forms you filled out.  This information is being used only for research purposes.  The researchers will be happy to share the general research study findings with you once they become available.  If you are interested, please e-mail JeffUhl@snip.net and a summary will be e-mailed back to you.

You may choose not to participate or stop participating at any time during the study without penalty.  Upon fully completing the three questionnaires, you will be paid at total of $10.00 for completing all of the information asked.  If at any time you indicate a desire to harm yourself or others, your confidentiality will not be maintained and the experimenter will follow necessary ethical and legal procedures to make sure you and others are safe. Some of the questions in the questionnaires deal with your thoughts, feelings, and behaviors.  It is possible, although unlikely, that some of the questions may trigger some upset.  If so, you can contact Dr. DiTomasso to discuss it and, if necessary, a referral can be arranged.

Again, your assistance in this study is greatly appreciated.  Your effort in answering the questions honestly  should help us to understand more about the way people think, feel and behave.  If you have any questions or concerns about this study or your rights as a participant, you may contact Dr. DiTomasso at (215) 871-6511.

Sincerely,


Jeffrey K. Uhl, MBA, MEd                              Robert A. DiTomasso, PhD, ABPP
Psy.D. Candidate                                        Professor and Chairman