EFFECTIVENESS OF SELF-MONITORING OF NEGATIVE SELF-STATEMENTS WITH CHRONIC PAIN PATIENTS

DISSERTATION

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By

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ABSTRACT

The post-injury return to work problem is severe and continues to result in loss of worker productivity and increased cost to business and industry nearing $16 billion annually. With the increase in workers’ compensation claims, there is a stronger push for returning consumers to work once they have reached Maximum Medical Improvement (MMI). If the injured worker’s condition is at MMI, temporary total payments are terminated. MMI is defined by Ohio Administrative Code Section 4121-3-32(A) (1) as “a treatment plateau.” Basically, a condition is at maximum medical improvement if it is determined the condition will change.

Due to financial cutbacks and increased need for vocational rehabilitation services, injured workers are being encouraged to enroll in vocational services and return to work once treatment providers and the Bureau of Workers Compensation (BWC) believe MMI has been satisfied and the percentage of residual functioning is evident. Despite these efforts, some consumers are either hesitant or refuse to embrace these changes and return to work.

This study examined the use of a self-monitoring intervention on the frequency of negative self statements of chronic pain patients within the therapeutic setting. Three
subjects who have secondary psychiatric claims through the Bureau of Workers’ compensation and who have chronic pain participated in this study. The subjects chosen for this study were of interest due to the complex pain issues and their pervasive negativistic thinking styles which surround their chronic pain and workers compensation status.

This study used an ABAB reversal design. This design was selected to determine a functional relationship between the target behaviors and the independent variable. This reversal design involves the repeated measurement of behavior in a given setting during four consecutive phases of an experiment: 1) Baseline 1 baseline phase in which the independent variable was absent, 2) Intervention phase during which the independent variable is introduced 3) a return to prior baseline conditions (Baseline 2) characterized by withdrawal of the independent variable and 4) return to the intervention phase (Intervention 2). Participants were observed under four conditions: 1) Baseline 1 2) Intervention 1 3) Baseline 2; and 4) Intervention 2.

Both baseline phases were conducted two times a week, 30 minutes each session totaling 1 hour per week. The investigator set a timer to delineate 30 minute segments and used a stopwatch to measure accrued time in which negative statements were made. The investigator conducted therapy sessions as per a typical session. The investigator did not use any behavior management during baseline observation and recording. Self monitoring activities were not utilized during baseline phases. Prior to the intervention phases, each participant was trained to monitor his or her behavior according to the procedures developed. The investigator introduced the self monitoring procedures and
instructions on how to track their own behavior. A list of examples of negative statements was used to demonstrate which statements needed to be documented.

Intervention phases were conducted until data was sufficiently stable to serve as the basis for experimental comparison. Participants anonymously completed questionnaires that asked how they felt about the variables, whether they felt the self monitoring techniques were helpful, and how the quality of their self statements improved. They responded to each question using a 5-point Likert scale.

Cognitive behavioral clinicians have long contended modifying of negative self appraisals with positive or balanced alternatives leads to positive changes in ones affective state, behavior and adaptive functioning. Patients diagnosed with chronic pain and comorbid diagnoses of anxiety and depression participated in this study and appeared to have benefited from the intervention. The results of this study suggest the patients lowered the amount of negative self statements made during each of the self monitoring interventions than during baseline.

Each of the three participants demonstrated the ability to lower the amount of both pain related and non-pain related negative self statements. Though the number of negative self statements made per therapy session decreased on average for each patient through each successive intervention, some of the return to baseline levels were not as elevated. This suggests possible occurrence of treatment effects, which suggest the patients began to internalize the treatment intervention during the second baseline phases.
Making therapy more effective and efficacious for patients is a likely goal for many clinicians. Therefore, the question of patient satisfaction of the self monitoring procedures is merited in the context of this study. The very nature of self monitoring emphasizes self efficacy and self regulation. Self-monitoring has been an effective tool utilized in educational and clinical settings. Self-monitoring can act as a motivating device by encouraging people to set goals of progressive improvement for themselves, even though they have not been explicitly asked to do so. In the case with chronic pain patients, increased levels of self regulation and self esteem may decrease negativistic thinking which may then lead to more predictable and improved outcomes.
DEDICATION

To my parents
ACKNOWLEDGMENTS

Many people come to mind as I write these words of appreciation and gratitude. Foremost, I wish to thank my advisor, Dr. Bruce Growick, for his guidance, support and encouragement over the past five years. His confidence in me taught me to push myself when I didn’t think I could and his commitment to me as a student enabled me to become an independent researcher. I want to also thank my committee members. With Dr. Konrad’s expertise in single subject design and analysis, I was able to expand my research knowledge and experience by conducting this study. To Dr. Mike Klein and Dr. Bruce Walsh, I would like to thank you for all of your constructive advice and for challenging me along the way.

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CHAPTER 1

INTRODUCTION

Physical pain may play an important role in many people’s lives. In fact, it is the leading symptom for which individuals seek medical advice and treatment (Turk, 1990). While pain serves as an important biologic function, during its acute phase it warns and prepares the body to cope with disease or injury. When pain continues long after this stage however, it ceases to perform a valuable function and becomes a serious detriment to the lifestyle of the victim. Chronic pain can become a physically and emotionally debilitating condition that frequently results in reduced work productivity, unemployment and absenteeism.

Often, individuals who perceive they are unable to work due to chronic pain seek monetary compensation for their disability (Rohling, Binder, & Langhinrichsen-Rohling, 1995). In addition to the debilitating physical effects, chronic pain that persists for months or even years has been shown to produce clinically significant symptoms of depression, anxiety, and even psychotic behavior.

Numerous studies have speculated that the strength of the financial compensation, may serve as disincentive for some workers to return to gainful
employment. Another disincentive to return to work may occur with claimants who receive more than one form of compensation from other government programs (i.e., Social Security Disability) or pensions while not working (Elias & Growick, 1994). A worker must be motivated to return to work in order to be an appropriate candidate for rehabilitation. However, when claimants receive secondary gains from not working, their motivation may diminish over time.

1.1 Statement of the Problem

Chronic pain is the most costly health problem in America, totaling fifty billion dollars per year spent on direct medical treatment, lost income, lost productivity, compensation payments and legal charges (National Institute of Neurological Disorders and Stroke, 2007). Millions of dollars alone are handed over each year to a drug industry that promises relief to pain sufferers who are guided by societal norms that may encourage dependency on a pill to cure them of their illness and their pain.

In the United States, more than half a million workers take an average of five months disability leave from work per year, and only 48% of those workers ever return to work (Tate, 1992). Chronic pain patients who seek financial compensation typically receive payment from one or more of the following sources: a) Bureau of Workers’ Compensation (BWC) or private disability sources b) Social Security Disability Insurance (SSDI) c) Military benefits from the Veterans Administration (VA) and/or d) Settlements from civil law suits related to accidents. Each of these sources of compensation has experienced marked increases in the numbers of claimants over the
years (Rohling et al, 1995). This growth has been so extraordinary that some experts have referred to it as an epidemic as well as, a major socioeconomic problem (Chapman & Brena, 1989).

There are varieties of pain and all forms of pain are not alike. Pain varies in intensity, duration, quality, and meaning (Turk, Meichenbaum, & Genest, 1983). It is commonly divided into two categories: acute (pain of recent onset) and chronic (lasting more than 6 months). Both forms of pain require different types of treatment and lead to special adjustments in a person’s life. Turner and Chapman (1982) note “the process of chronicity alters the patient both psychologically and physiologically so that there are complex changes in affect, thought processes, and behavioral patterns that contribute to making painful disorders self-perpetuating”.

From a medical perspective, pain is a physiological phenomenon; however, it derives much of its complexity from the layers of psychological interpretation and emotional significance which accompany it. Pain and discomfort outlast their usefulness for human survival and may contribute to a decrease in the quality of a person’s life.

One third to one-half of all Americans will seek treatment for chronic pain at some time in their lives, with low back pain as the principal diagnosis in 10% of all chronic health conditions (Keller & Butcher, 1991). Pain of long duration often overwhelms the person’s character, changing their behavior, thinking, and interpersonal style. People so afflicted often cannot work. Their appetite diminishes. Physical activity of any kind is exhausting and may aggravate the pain. Soon the person becomes the victim of a vicious circle in which total preoccupation with pain leads to
irritability and depression. The sufferer cannot sleep at night and the next day’s weariness compounds the problem leading to more irritability, depression, and pain. Specialists call this unhappy state the “terrible triad” of suffering, sleeplessness, and sadness; a calamity that is as hard on the family as it is on the victim (National Institute of Neurological Disorders and Stroke, 2007).

Many times, the pain cannot be stopped by conventional medical techniques and persists long after visible tissue damage has ceased, sometimes causing physicians to become frustrated and lump individuals into “real” and imaginary” pain categories (National Institute of Neurological Disorders and Stroke, 2007). Over the past two decades, there has been a move away from this dichotomous model of pain (“real” is equal to actual tissue damage, and “imaginary” refers to suffering with no clear organic base) and into a multidimensional definition that recognizes affective, psychological, cognitive, behavioral, and social components of the problem (Keller & Butcher, 1991).

A person’s response to pain is influenced by a myriad of psychological, biological, and socioeconomic factors. Assessment and treatment of the person who reports pain requires attention to all of these factors (Turk, 1996). Treatment approaches for the management of chronic pain have been historically based on the medical model such as use of pharmacological agents, anesthetic nerve blocks and surgical procedures. In contrast, the biopsychosocial model of pain treatment aspires to help individuals build healthier and more effective coping skills when confronted with pain. These factors make pain a key focus for clinicians and rehabilitation professionals and a high priority area for research (Schumacher, 2002).
1.2 **Purpose of the Study**

The post-injury return to work problem is severe and continues to result in loss of worker productivity and increased cost to business and industry (Gatchel, Robinson, & Stowell, 2006) nearing $16 billion annually. With the increase in workers’ compensation claims, there is a stronger push for returning consumers to work once they have reached Maximum Medical Improvement (MMI). If the injured worker’s condition is at MMI, temporary total payments are terminated. MMI is defined by Ohio Administrative Code Section 4121-3-32(A) (1) as “a treatment plateau.” Basically, a condition is at maximum medical improvement if it is determined the condition will change.

Due to financial cutbacks and increased need for vocational rehabilitation services, injured workers are being encouraged to enroll in vocational services and return to work once treatment providers and the Bureau of Workers Compensation (BWC) believe MMI has been satisfied and the percentage of residual functioning is evident. Despite these efforts, some consumers are either hesitant or refuse to embrace these changes and return to work. It is possible these barriers placed by the consumer are based on fear, avoidance, apathy and lack of motivation. Many consumers with chronic pain see themselves in a negative light and think their situation is not going to improve. Many of their thoughts involve statements such as “I could never go back to work”, “I can’t do anything with my pain”, and “No one will hire me”.

With self defeating statements such as these contributing to the challenges of returning injured workers to successful employment, there is a need to make clients
aware of the nature and frequency of their negative self statements. Additionally, the awareness and reduction of negative self statements represents a beneficial therapeutic behavior change and may ultimately facilitate one’s return to work. Hence, there is a strong need to develop interventions that can improve treatment and focus on the patients’ development of self-regulatory techniques. The purpose of this study was to examine the effects of a self-monitoring intervention on the frequency of negative self statements of chronic pain patients within the therapeutic setting.

Due to the fact long-term disability is such a significant social and economic issue, actions to minimize problems and increase the quality of life for those with chronic pain is of great importance. This study looked at the effects of the intervention and how these effects were maintained and generalized in other settings. While it is not possible to study all compensation injuries, this study focused on the workers compensation recipient who had been diagnosed with chronic pain and a psychiatric disability.

1.3 Delimitations

Participants in this study met certain criteria for inclusion set forth by the BWC and the researcher. Claimants must have demonstrated rehabilitation potential and be considered to have reached MMI. Experts in vocational rehabilitation, as well as, treating physicians, psychologists and psychiatrists who represent the claimant needed to make a referral to rehabilitation. According to BWC estimates, about 10% of workers compensation claimants are referred to rehabilitation (Schumacher, 2002).
1.4 Operational Definitions

**Acute Pain:** Pain associated with acute disease or injury which lasts no longer than 6 months.

**Chronic Pain:** Pain that lasts for 6 months or more after recovery from injury. Chronic pain is a syndrome composed of physical, emotional and behavioral changes which can alter one’s state of being healthy to that of an invalid.

**Claimant:** An injured worker attempting to receive or presently receiving Workers’ Compensation benefits.

**Disability:** “Any restriction or lack of ability to perform an activity in the manner or with the range considered normal for a human being, such as climbing stairs, lifting groceries, or talking on a telephone. Disability is a performance-based, behavioral concept” (Turk & Rudy, 1992).

**Maximum Medical Improvement (MMI):** Once a claimant has received treatment from a team consisting of a physician, physical therapist, psychiatrist, and/or psychologist, and the individual cannot improve his or her current medical or psychological status they are considered to have reached MMI.

**Return to Work (RTW):** Defined as return to pre-injury job on a full time basis; or return to any job on a part-time or full-time basis (pre injury, modified or new)

**Self Monitoring:** Refers to the systematic observation and recording of ones own behavior.
**Self Determination:** Self determination theory hypothesizes that people are inherently motivated to internalize the regulation of uninteresting though important activities. Wehmeyer (1995) identified the following twelve components of self-determination: self awareness, self esteem, self confidence, attitudinal perceptions, self efficacy, outcome expectancy, locus of control, abilities, choice and decision making, problem identification and solving, goal attainment, and self organization.

**Workers’ Compensation:** Initially formed when the United States congress established public finds for the health care of merchant seaman. In the early 1900’s, this system expanded with legislation that required employers to pay for disabilities suffered by workers while on the job, regardless of fault (Rohling et al., 1995). Injured workers are provided with rehabilitative services, medical benefits, and financial income equal to about 65% of their pay at the time of injury. Disbursement of compensation varies from state to state.

### 1.5 Research Questions

1. What are the effects of a self management procedure for chronic pain patients on the negative self statements made in 30 minute therapy sessions two times a week?

2. What are the effects of a self management procedure for chronic pain patients on the negative pain-related self statements made in 30 minute therapy sessions two times a week?
3. Will there be improvements in the level of depression for chronic pain patients following a self management intervention?

4. To what extent will consumers on workers’ compensation who have chronic pain approve of the interventions’ effectiveness for decreasing negative self statements?

1.6 Summary

Chronic pain has become a major health problem in the United States, causing significant emotional, physical and financial tolls on those affected. This study attempts to examine the effects of negative statements made by those who have chronic pain who are involved with the BWC and its relationship to vocational success. The present investigation will look at the use of self monitoring techniques while considering positive and negative self statements used by chronic pain patients. The statement of the problem, the significance of the study, delimitations and definitions of terms has been presented in this chapter. Chapter II provides a review of the pertinent literature.
CHAPTER 2
REVIEW OF THE LITERATURE

This chapter reviews the literature on: (a) characteristics of chronic pain patients, (b) the definition of chronic pain, (c) the relationship of chronic pain to depression, (d) treatment models for chronic pain (e) self control theories and strategies along with a summary of the literature. Specifically, the roles of self regulatory training in improving the level of self efficacy with this population will be explored.

Clinicians working with individuals who have chronic pain and compromised abilities to obtain successful gainful employment face many challenges in the healthcare and the vocational rehabilitation arena. One of the issues clinicians face in treating chronic pain patients (CPP) is the lack of positive reinforcement procedures to decrease problem pain behaviors. (Marcus & Vollmer, 1995). CPP’s noncompliance with subscribed treatment techniques has been a primary barrier in efforts to return injured workers to work. Such behaviors may take many forms, such as passivity, aggression, verbal and/or physical refusal and can directly impact a patient’s meaningful and active participation in physical relief from pain along with vocational success.

2.1 Characteristics of Chronic Pain Patients

Some 70 million Americans will experience acute, recurrent or chronic pain this year, and for many of them surgical and pharmacological interventions will fail to
relieve suffering. Although research shows no single pain-prone personality, studies have indicated that patients vary widely in how they perceive and adapt and manage pain. Additionally, there are other variables under which CPP’s fall which need to be considered in order to better address treatment issues.

Psychosocial factors such as compensation status, age and depression are believed to be more influential with regard to how one may experience chronic pain (Garofalo & Polatin, 1999). Specifically, these factors address the chronic pain population in the Workers’ Compensation system. Although physical factors may provide some insight into the level of duress one is experiencing, it is these demographic factors that have been frequently used in return to work and rehabilitation outcome research.

Numerous studies have identified a relationship between certain demographic characteristics of disabled workers and the phenomena of post-injury return to work. For example, age has shown to be a useful predictor for return to work (Fredrickson, Trief, VanBeveren, Yuan & Baum, 1998; Rathburn & Seeman, 1994; Vanderkolk & Vanderkolk, 1990). In the Fredrickson et al study, 55% of the 80 participants under the age of 50 returned to work compared to only 23% over the age of 50. Likewise, Gallagher et al, (1995) found that the younger the claimant is at the time of disability, the more likely that he or she will return to work.

In their research on return to work influencing factors, Rathburn and Seeman (1994) found that individuals over the age of 65 were more likely to return to work than others half their age. The authors explained that the persons who chose to work past the
age of 65 were usually fairly healthy, had less physically demanding jobs, and had higher levels of education.

Gender has also been found to be associated with return to work. Several studies indicated that women are more likely to return to work after an injury or being diagnosed with a disability (Gallagher et al, 1995; Rathburn & Seeman, 1994). Rathburn and Seeman hypothesized that positions generally held by women are less physically demanding than positions held by men; therefore, more women may work regardless of their pain experiences.

Issues surrounding one’s history of occupational injury appear to have an adverse affect on one’s potential to return to work as well (Lancourt & Kettlehut, 1992; Latham & Davis, 1994). The more claims a person files with BWC, the less likely he or she will return to work. In their 1994 study, Rathburn and Seeman modified the Menninger Return to Work (RTW) Scale and developed the Fortis RTW Scale to predict a disabled employee’s likelihood of returning to work after an injury. The Fortis RTW scale was based on nine claimant characteristics such as age, gender, and salary. The goal was to identify those persons who would benefit the most from vocational rehabilitation and reduce costs to the insurers.

Consistent with results of previous studies, Rathburn and Seeman (1994) also found that individuals injured off the job are more likely to return to work than those who are injured on the job. They found that claimants earning less than $2,250 per month were more likely to return to work than those earning beyond that amount. The authors explained this finding by noting that since benefits are typically 60% of wages,
it is more difficult for one to maintain one’s quality of life standard with a lower benefit amount, thus increasing ones motivation to return to work. Lastly, individuals who retain an attorney following a disability are less likely to return to work that are those who do not. They found that 10% of persons who retained an attorney returned to work (pp.323-324).

The previously mentioned study is limited in that it does not include important psychological factors that are imperative to address when looking at return to work success. Psychological factors such as cognitive appraisals of one’s pain and sense of agency are especially important to address when looking at motivation and adherence to return to work behaviors.

Assessment of identifying the chronic pain personality has been addressed using the Minnesota Multiphasic Personality Inventory (MMPI) and, more recently, the MMPI-2. Although other assessment instruments have received attention in the literature, the MMPI-2 is one of the most commonly used instruments (Keller & Butcher, 1991; Nickel, 1993; White, 1995).

The majority of researchers have treated CPP’s as a homogeneous group with shared personality characteristics which need to be discovered, described, and eventually modified through treatment. Many studies have attempted to encapsulate the typical chronic pain personality. Such research provides important data needed to develop and test theories of etiology and maintenance, although its usefulness as a tool for predicting treatment outcome has recently come into question.
The available descriptive literature has described the typical CPP as being hypochondriacal (preoccupied with somatic symptoms and disease phobias, anxious and irritable, withdrawing from life problems), having an hysterical personality style (marked denial of psychological problems, inhibition of aggression, attention-seeking, dependent, suggestible, with somatic symptoms serving to resolve emotional conflict and express needs), and alexithymic (concrete, no language for feelings or abstract concepts, but with interpersonal and emotional interaction through body language) (Hammerly, 2003).

These patients may have assumed adult caretaking and work roles early in life, resulting in unmet dependency needs. They are described as suffering from either obvious or masked depression, manipulative of social systems to meet their needs, and tending to see themselves as helpless and without resources or skills to take control of their lives (Aronoff & Rutrick, 1985; Keller & Butcher, 1991; Sternbach, 1974). Multidimensional personality measures such as the MMPI and MMPI-2 do not include all relevant factors that may be used in subgrouping patients; however, they seem to be a valid representation of the ways many life-history and demographic factors gain predictive importance through their effect on coping style, affective status, self-appraisal and worldview (Harris, 1982). Moreover, such instruments have shown validity in predicting patterns of behavior and may represent a way of measuring final common pathways, in terms of cognitive, affective, and behavioral dispositions, of a variety of life experiences (Keller & Butcher, 1991).
For some patients, an unfortunate consequence of dealing with chronic pain may be that they come to develop a personal identity as “chronic pain patients.” Such persons continue to seek diagnoses and medical cures, often “shopping” from doctor to doctor, with minimal results. They also take on a sick person role, equating chronic pain with disability.

The paradox is that patients who accept their pain as a chronic condition have lower perceived pain levels, less pain-related distress and depression, less avoidance of activities, lower levels of disability, and greater daily function (McCracken & Turk, 2002). Acceptance in this regard is defined as recognizing that one has a chronic condition that cannot necessarily be cured, letting go of fruitless attempts to rid oneself of the pain, working toward living a satisfying life despite the pain, and not equating chronic pain with disability. In fact, it has been suggested that one of the main aims of behavioral intervention should be to facilitate patients’ acceptance of their pain and, in doing so, to broaden their identity beyond that of disabled chronic pain patients (Morley, Biggs, & Shapiro, 2004).

Patients will vary widely in terms of their level of motivation and commitment to take on new approaches. The typical patient, however, has been submerged in a medicalized approach to dealing with health-related problems, and may enter into psychological treatment with little understanding of what is involved, or may assume that such approaches are for those without “real” pain. Thus it is probably unrealistic to expect typical patients with pain to adopt behavioral self-management strategies, without first helping them to change their outlook. When patients feel that the reality of
their pain has been delegitimized by medicine, they may be less receptive to potential interventions by mental health practitioners.

Despite an increasing body of literature that supports many of the assumptions of applied behavioral techniques as an approach to managing pain and involving the pain experience, studies related specifically to injured workers and the use of behavioral techniques to manage chronic pain are limited.

2.2 Definition of Chronic Pain

One of the difficulties encountered by clinicians and researchers is defining pain. Current definitions of pain accept the importance of psychological factors in the pain experience. The International Association for the Study of Pain (IASP) defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (2007). The American Chronic Pain Association (2001) described chronic pain as pain that “continues a month or more beyond the usual recovery period for an illness or injury or pain that goes on over months or years as a result of a chronic condition. It may be continuous or come and go”.

Pain can vary in intensity, quality, duration, and meaning. Turk, Meichenbaum, and Genest (1983) categorize pain in to five different types:

1. Acute pain, usually self-limiting and of less than 6 month’s duration (e.g., post surgical pain, dental pain, pain accompanying childbirth).

2. Chronic periodic pain that is acute but intermittent (e.g., migraine headaches)
3. Chronic, intractable, benign pain, present most of the time, with varying intensity (e.g., low back pain).
4. Chronic, progressive pain often associated with malignancies.
5. Experimentally induced pain with nociceptive stimulation produced in a laboratory setting (e.g., electric shock, radiant heat, muscle ischemia).

Sternbach (1987) distinguishes between acute and chronic pain. Acute pain refers to pain of recent onset or short duration. Acute pain may be a symptom of an illness, a warning signal to avoid further damage or seek help, or a special need-state meant to keep us still in order for healing to occur. Acute pain may be a biological symptom of an apparent nociceptive stimulus, such as tissue damage due to a disease or trauma. The persistence of pain is known as chronic pain. Any pain that lasts more than 6 months is usually considered to be chronic in nature. Chronic pain is a syndrome composed of physical, emotional and behavioral changes which can alter one’s state of being healthy to that of an invalid.

In its published clinical practice guideline, the American Geriatrics Society Panel on Persistent Pain in Older persons (2002) defines persistent pain as a painful experience that continues for a long period of time that may or may not be associated with a recognizable disease process. The panel also indicated that the use of the term “persistent pain” rather than “chronic pain” may foster a more positive attitude by patients and treating professionals. The panel also suggests that the term “chronic pain” has become a label that is negatively associated and facilitates negative stereotypes.
associated with longstanding psychiatric problems futility in treatment, malingering and or drug seeking behaviors (Yang, 2006).

2.3 Relationship of Chronic Pain to Depression

Depression has been the most common psychiatric diagnosis for patients with chronic pain (Trief, Carnrike, & Drudge, 1995). According to Philips and Rachman (1996), those suffering from chronic pain are two to five times likely as those without pain to develop depression. Research also indicates that depression is an important predictor of disability in CPP’s as well as a predictor for motivation for intervention and treatment outcome (Turk, Okifuji, & Scharff, 1995).

Debates over whether or not pain causes depression or whether it is more a function of emotional disturbance contributing to pain has prompted research in this area. Evidence supports a causal relationship between depression and chronic pain: studies have found both that chronic pain leads to depression and that depression leads to chronic pain (Katon & Ciechanowski, 2002). A recent longitudinal study found that individuals with chronic medical conditions have an increased risk of developing depression compared to those without medical conditions (Resnik, Rehm, & Minard, 2001).

Other studies have found that that depression is a risk factor for coronary heart disease (Ford, Mead, Chang, Cooper-Patrick, Wang & Klag, 1998) heart failure, and diabetes (Gleeson-Kreig, 2006).
Cohen and Rodriguez (1995) explain these findings by theorizing that the depression-pain relationship functions through four pathways: biological, behavioral, cognitive and social. For example, the presence of chronic pain can affect the development of depression through neurochemical effects (biological), sick role behaviors (behavioral), threats to self efficacy (cognitive), or interference with role functioning (social).

Rudy, Kerns, and Turk (1998) studied the pathways between pain severity, life interference due to pain, self control, and depression in a sample of chronic pain patients. They found that there was not as direct path between pain and depression. The other variables included in this study (pain severity, life interference, and decreased self control) together mediated the development of depression among chronic pain patients.

Kleinke (1991) examined a cognitive-behavioral mediation model for understanding the relationship between chronic pain and depression. Results showed that more successful treatment outcomes in a multidisciplinary pain center were moderated less by patients’ depression than by their cognitive appraisals and coping strategies. Based on these findings, Kleinke recommended that the use of cognitive assessment and skills training be included in the treatment for chronic pain.

Trief, Carndike, and Drudge (1995) examined the relationships between family environment, social support and depression for 70 patients with chronic back pain. Results showed that depressed chronic pain patients saw themselves as having fewer available supportive people in their lives, as well as, less satisfaction with the quality of the support that nondepressed patients did. Patients who reported that they perceived
their families as committed, cohesive and helpful, were less likely to be depressed. Trief et al (1995) concluded that, as with cancer and heart disease, low social support might be a risk factor for depression in patients with chronic pain. These findings point to the potential value of family involvement in the treatment for chronic pain.

2.4 Treatment Models

Historically, patients with chronic pain were viewed from the medical perspective which focuses on biological factors contributing to disease rather than a psychological one. The biomedical paradigm, evolving simultaneously with developments in the fields of genetics, anatomy, and physiology, views biological factors as being primary in the causation and maintenance of disease. In this model, a patient’s complaint is assumed to result from a specific disease state manifested by a biologic disorder (Weisberg & Clavel, 1999). The biomedical model provides a clearly articulated scientific framework for understanding the disease process and mechanisms of remedy, and it excels at treating infectious diseases and acute or traumatic injuries. Biomedicine also excels in emergency care: a patient who suddenly experiences heart failure needs a cardiac specialist, not an acupuncturist. The model also cures many conditions that have single, specific causes.

The biomedical model's orientation may often be seen as distant, detached, and deficient in empathy and warmth however. The model may alienate patients from their own being when their mental, emotional, and spiritual realities are seen as having little bearing on disease or healing. Feelings of depression, rage, social isolation, and bewilderment, and other subjective, but significant, experiences are often discounted,
invalidated, or denied as hallucinatory. Biomedicine creates feelings of dependence and personal estrangement as individuals "exchange the status of person for that of patient." (Cohen, 1988).

While traditional biomedicine has made tremendous contributions to health, attention to biologic factors although necessary, is insufficient for conceptualization and treatment of chronic pain. The need for a different model has been acknowledged (Turk, 1996, Engel, 1977).

The biopsychosocial model represents an attempt to incorporate, but also expand, what is best from biomedicine. This model reflects a combination of biologic, psychological, social, and cultural influences that are viewed as essential in causing, maintaining and exacerbating disease. Engel first conceived of the biopsychosocial model in 1977. He believed that illness represented a complex interaction of biological, social and psychological factors.

Proponents of the biopsychosocial model contend that biological factors are more important in initiating and maintaining pain in the acute phase. As time passes however, psychological factors influence one’s appraisal and perception of the original injury; and the social context further influences how an individual acts based on this understanding (Turk, 1996). In other words, biological factors appear to initiate one’s first reporting of pain symptoms; over time however, psychosocial and behavioral factors may serve to maintain or exacerbate levels of pain and to influence one’s disability and return to work status.
The first and most popular theory to emerge from this new perspective was the Gate Control theory of pain. In 1965, Canadian psychologist Ronald Melzack and British physiologist Patrick Wall, collaborated on a paper, “Pain Mechanisms: A New Theory,” (Science: 150, 171-179, 1965). This has often been described as the most influential paper ever written in the field of pain. Melzack and Wall suggested a gating mechanism within the spinal cord that closed in response to normal stimulation of the fast conducting “touch” nerve fibers; but opened when the slow conducting “pain” fibers transmitted a high volume and intensity of sensory signals. The gate could be closed again if these signals were countered by renewed stimulation of the large fibers.

This idea offered a new heuristic for pain treatment research, one which integrated experimental and clinical observations, and inspired many young scientists to begin work on the problem. Although the model has been much revised since 1965, the idea of the emotional modulation of pain perception within the nervous system continues to be central to pain studies. The gate control theory opened the door for pain to be included within the biopsychosocial model of illness. With the introduction of theories such as the Gate model, capable of explaining multiple aspects of the pain problem, methods of treating chronic pain also have become multidisciplinary, emphasizing the condition is a complex phenomenon which impacts on all areas of the person’s life.

Recent research in biopsychosocial risk factors for pain chronicity have focused on a variety of biological factors that include parameters of physical examination; along with psychological factors which include chronic stress at work or at home, depression,
maladaptive pain-related cognitions and pain coping strategies; and social factors including age, sex and social status; and occupational factors as possible predictors (Hasenbring, 1998). This biopsychosocial approach has been slowly gaining salient presence in the medical, psychology, legislative, research, funding, and advocacy arenas, as several interrelated factors in the understanding of pain paved the way in this important area.

This current view of chronic pain was seen as a paradigm shift that had received acceptance from the majority of professionals and researchers in the field. However, the broader healthcare agencies (i.e. Workers’ Compensation, Medicare) that are responsible for providing services to chronic pain patients have been less accepting of this shift.

2.5 Cognitive Variables

It is believed that cognitive and emotional variables influence the experience of pain (Turk, 1996). The process of modifying a person’s negative cognitions may be helpful in altering the pain experience. The latest in psychologically based interventions do consider cognitive factors, including appraisals, beliefs, and expectations, as well as, ongoing cognitive processes such as automatic thoughts and self-statements.

The appraisal of stimulation through one’s cognitions is also influential (Holzman & Turk, 1986). An individual’s appraisals are dynamic; they change in accordance with their belief in the consequences of an event, the perceived importance of the event to their well being, and the perceived resources they believe they have to cope with the event. In fact, an individual’s belief system mediates their cognitive
appraisals (Beck, 1976). One belief system unique to CPP is their systematic beliefs regarding their pain. These beliefs can influence the patient choice of and compliance to pain treatments.

For example, Schwartz, DeGoode, and Shutty (1985) found pain patients who believed in education about treatment and that the rationale behind it was relevant to treatment for pain were more likely to have positive outcomes than those who failed to see its utility. In another study, Williams and Keefe (1991), using the Pain Beliefs and Perceptions Inventory, found that pain patients who viewed their pain as enduring and mysterious reported having less confidence in pain management strategies and less confidence in their abilities to adhere to them than other patients.

Typically CPP’s are prone to using maladaptive ways of coping such as cognitive errors and distortion. Overall distress and dysfunction such as sleep disturbance, poor social support, and low activity levels was found for patients who engaged in high frequency use of catastrophizing and overgeneralization (Smith, Follick and Ahern, 1996).

Those patients who reported use of catastrophizing cognitions at pretreatment were found to have higher pain ratings, greater physical disability and depression a 6 month follow ups than those patients who engaged in this behavior less frequently (Keefe, Brown, Wallson, and Caldwell, 1989).

2.6 Cognitive Behavioral Treatments

Current pain treatment programs tend to take a pragmatic, eclectic view of the problem and attempt to attack as many facets and contributors to the chronic pain
syndrome as possible (National Institute of Neurological Disorders and Stroke, 1998). The most widely used psychologically based treatment approaches for the management of chronic pain are mostly cognitive behavioral in nature. The efficacy of cognitive behavioral interventions with chronic pain has been widely investigated (Fernandez & Turk, 1989; Turk & Rudy, 1992; Gleeson-Kreig, 2006) with continued attempts to address the increasing demands of this population.

Studies have shown that patients who go on to develop chronic pain are more depressed, more chronically stressed at work, and have more catastrophizing or helplessness/hopelessness thoughts as well as using more distracting or suppressed thinking (Turk, 1990, Banks, 1997). The application of cognitive behavioral theory (CBT) and techniques may help patients in learning to identify their distorted thought processes and substitute positive thoughts for negative ones.

A basic assumption of CBT is that the thoughts or beliefs one has determines their emotional and/or behavioral reactions to their environment. For example, CPP’s treated with CBT were found to have significantly decreased their functional impairment and use of medication and significantly increased their use of active coping strategies and their self efficacy as compared to an attention-control condition (Nicolas, Wilson and Goyen, 1992). Additionally, a CBT treatment consisting of identification of cognitive and affective responses to pain, acquisition of imagery and relaxations skills, and use of coping self statements for stress and pain management, was found to be effective for pain management. (Turner and Clancy, 1986).
A variety of cognitive behavioral based treatments have been used with chronic pain patients who have an assortment of syndromes (e.g. low back pain, migraines, cancer, and fibromyalgia). The first pain clinics to include a psychological component to their treatment approach were based on the operant model of pain (Fordyce, 1976), and were strongly behavioral. In a strict operant model, behavior is determined by reinforcement, and cognitions are irrelevant to the prediction of behavior. CBT for pain usually consists of three phases of treatment. These phases include a) psychoeducation about the nature of pain and the role of cognitions, affect and behavior, b) skills acquisition, and c) rehearsal of cognitive and behavior techniques.

Although the psychological treatment of chronic pain has since expanded to include the cognitive, its heritage is decidedly behavioral. The behavioral aspects of psychological treatment for pain are said to have been around longer and are more thoroughly researched than the cognitive aspects (Philpot & Bamburg, 1996). For example, a review of the intervention research on chronic pain revealed that increasing positive self statements and/or decreasing negative self statements is effective in a) decreasing scores on depression scales b) decreasing self-defeating behaviors, c) decreasing stress scores, and d) increasing self esteem (Philpot & Bamburg, 1996, Calvette & Cardenoso, 2002, Coulson, 2006). These findings support the notion that changing operant behaviors (e.g. decreasing negative self statement) may influence other covert conditions such as self-esteem.

Sinclair and Wallston, Dwyer, Blackburn & Fuchs (1998) conducted a quasi-experimental study to evaluate the effectiveness of a cognitive behavioral nursing
intervention for women with rheumatoid arthritis (RA). Ninety adult women with RA participated in 1 of 14 nurse-led groups over an 18-month period. Personal coping resources, pain coping behaviors, psychological well-being, and disease symptomatology were measured at four time periods. Results showed significant changes on all of the measures of personal coping resources (p<.001) and psychological well being (p<.05), half of the pain coping behaviors (p<.05) and one indicator of disease symptomatology (fatigue, p<.05), from pre-to post intervention. Furthermore, the positive changes brought about by the program were maintained over a three month follow-up period.

With all of the various interventions offered for chronic pain patients, it appears that little attention has been given to the use of self monitoring and self regulatory techniques for those with chronic pain. Specifically, there lacks literature on the relationship between negative self statements, cognitive appraisals and return to work for those BWC claimants who have reached Maximum Medical Improvement (MMI) and are considered employable.

Typically, efforts to control and treat pain have stemmed directly from basic assumptions regarding the cause and management of disease. Treatment approaches are often unclear with the chronic pain population and there is an increased demand to provide more effective treatment outcomes. Helping clients to become aware of and examine the thoughts and beliefs and that shape their coping attempts is an important first step in motivating them to take on a new set of strategies, and ultimately a new
identity for themselves. Such techniques, specifically those involving self monitoring of pain related thoughts are the essence of this study.

According to Turk et al (1995), it’s not necessarily the coping strategy that plays an important role in the pain level of the patient but the patient’s attitude about the treatment approaches for the management of pain that determines whether the treatment modality used is effective. Turner and Chapman (1982) have also noted the importance of patient perception on how he or she is taking charge of their pain as playing a major role in pain management approaches.

Due to the fact that the potency of how one thinks is one of the most powerful forces that influence levels of pain, altering one’s pain perception is of critical importance. Altering the perception of pain through self-management may be the key to controlling symptoms. It is important for the chronic pain patient to believe in the efficacy of self control/self management techniques so they can use them to control pain. One of the more popular techniques in self regulatory theory is the use of positive and negative self statements. The effect of a patients beliefs regarding control of his or her pain and whether or not this is associated with positive treatment outcomes is an area that has not been fully investigated. Most theorists agree however that there is a relationship between what a person believes and expects and what he or she does in any given situation. For example:

Both positive and negative thoughts can lead to an increase in pain behaviors or a decrease in pain related issues. Positive thinking and self-management of
positive attitudes have been linked to successful pain management and potential for successful return to work outcomes (Turk, 1990).

The definition and conceptualization of positive self statements varies widely in the literature. The majority of research on self-talk lies within the field of clinical psychology. Self-talk is generally defined as a way of describing our inner dialogues that part of our thinking process in the form of making statements to ourselves as we perform tasks, confront challenges, and make decisions. Common statements used include “calm” and “relax” to single-sentence statements such as “I can do it” and “I am worthy of love” to more elaborate forms of self affirmation. The application of self talk and its techniques has been widespread with many promising results found in using cognitive behavioral therapies.

French pharmacist and psychotherapist Emile Coue was the first to use positive self statements to enhance the mood of his clients. He prescribed the saying “every day in every way I am getting better and better” (Coue, 1922). He wrote extensively on the theory and practice of “autosuggestion”, a process in which an individual trains the subconscious mind to believe something, or systematically schematizes the person's own mental associations, usually for a given purpose. Later in the 1950’s preacher Norman Vincent Peale coined the term “the power of positive thinking” (Peale, 1952).

The use of mental imagery and self affirming statements in the preparation of athletes have long been used (Taylor, 1979). In mainstream culture, self-help books and the use of buzzwords such as “positive internal dialogue”, “positive self talk” and
“positive affirmations” have been readily accepted by clinicians, authors, researchers and laypeople. While some of these buzzwords are at times shrouded in skepticism, the power of self talk is that it can stimulate change and raise the level of self efficacy in an individual who has lost hope in healing.

Farrell, Hains and Davies, (1998) focused a study on the training of relaxation skills, positive self talk and cognitive restructuring with four patients experiencing Post Traumatic Stress Disorder (PTSD). Using a multiple baseline design, the researchers examined the effectiveness of a cognitive behavioral technique on the above behaviors. All four subjects reported decreases in their PTSD symptomatology.

Another clinical application of the self talk technique is how it is used as a coping strategy for pain and pain related behaviors. Schonfeld (1992) conducted a case study with a 55 year old female psychiatric chronic pain patient. Cognitive behavioral treatment was used to reduce pain flare ups and lower the patient’s dependence on her medications. Specifically, treatment involved the use of covert assertion and a combination of thought stopping and positive self talk. In this method, the participant identified negative statements, stopped that statement and replaced it with a positive statement. Results of this case study showed that the patient was able to control her pain along with her level of depression and limit her dependence on pain medication with this intervention.

Research has demonstrated self talk affects may aspects of our daily functioning. Various studies have shown that positive thoughts are associated with positive outcomes, including greater adaptive functioning and enhanced motivation (Taylor &

Positive self talk has been shown to be a useful tool in increasing adherence to rehabilitation programs. Scherzer, Brewer, Cornelius, Van Raatle, Petitpas, Sklar, Pohlman, Drushell and Ditmar (2001) investigated the effectiveness of goal setting, imagery, and positive self talk on adherence to a rehabilitation program after anterior-cruciate-ligament reconstruction. They found that positive self talk was positively correlated to completion of the home exercise component of the rehabilitation program. The study also noted that psychological skills such as self talk may play a significant role in promoting compliance to rehabilitation programs.

One good example of this is the groundbreaking study by Smyth, Stone, Hurewitz, and Kaell (1999) in which people with asthma and arthritis were asked to write about emotional upheavals or control topics. Many effects that were not apparent in the month after writing emerged in the months afterwards. The effects of writing and the monitoring of one’s thoughts appeared to be gradual and cumulative, possibly reflecting a host of psychological, social, and biological processes. These individuals entered the study dealing with an emotional upheaval that burdened them in some way. They constantly thought about their pain, had dreams about it, and perhaps avoided talking about it with friends and family.

The emotional and psychological work of the experience may have affected their performance at school or on the job and may have had a detrimental effect on their physical health via a generalized stress response. By having the patients write about
their pain experience, they were forced to think about their emotional upheavals and their lives in general. It changed the ways they thought about the events in the short term and the long term. These changes provoked social and emotional changes that further affected cognitive changes.

In contrast to positive self talk, negative thinking and negative self-appraisals are associated with poor psychological adjustment, depression, and anxiety (Ingram & Wisnicki, 1988). Various authors have proposed different functions of self-talk, which includes both positive and negative ways of thinking. Morin (1995) summarized research that revealed functions such as self-regulation, planning problem solving, and self awareness. Pedersen (1999) suggested self talk provides a way to “actively manipulate the environment, evaluate ourselves, find meaning, and direct our behavior accordingly” (p.12) while Calvette and Cardenoso (2002) proposed self-talk plays a crucial role as a mediator between emotions, events and our reactions to those events.

Fields (2002) stated silent repetition of a word or phrase can be useful because repetition maintains a high priority of the problem or problematic situation throughout our cognitive system, especially when the coping process is not successful. Patients with a positive attitude towards pain control, who avoid catastrophizing and who believe they are not severely disabled, show greater functional ability. An emotional suffering response to an injury is due in large part to beliefs about the disability, rather than to the injured body part itself. For example, anxious individuals tend to overestimate the risk and consequences of injuries. Depressed people may actually spend time alone ruminating about their depressive symptoms, becoming more
depressed about being depressed. Discouraged individuals can develop a process of thinking known as “learned helplessness” where people think they have no control or influence on the outcome of an event, no control of their own fate (Seligman, 2002).

Once an anxiety response is in place, chronic pain may be maintained or exacerbated through direct physiological mechanisms. Fear of pain and fear of movement/reinjury, both of which lead to further physical deconditioning through avoidance of activities that have potential for long-term pain reduction, may also contribute to the maintenance of pain (Turk, 1990). Avoidance may be reinforced through operant learning mechanisms. For example, unwanted responsibilities may be avoided, or anxiety associated with the anticipation of further pain-related experiences may be reduced.

The repetition of positive self-statements appears to be a logical intervention for individuals with chronic pain who are prone to negative thinking. Cognitive behavioral clinicians have long contended modifying of negative self appraisals with positive or balanced alternatives leads to positive changes in ones affective state, behavior and adaptive functioning (Meichenbaum, 2001). Cognitive factors are of great significance, with avoidance leading to decreased self-efficacy and increased expectations that stimulation will increase pain, which in turn leads to increased avoidance (Miller & Kraus, 1990). The result is a self-defeating cycle between cognition and behavior.

Supporting evidence for these ideas has come from a study reporting that pain-related fear-avoidance beliefs about work are the most specific and powerful factors accounting for disability and work loss associated with chronic pain (Waddell, 1992).
One additional cognitive factor that may be important in maintaining chronic pain is the tendency of anxiety-sensitive patients to catastrophically misinterpret sensations of arousal that are associated with pain.

The effect of a patient’s beliefs regarding control of his or her pain levels and whether or not this is associated with positive treatment outcomes is an area that has not been fully investigated. By teaching patients how to monitor their own thoughts and actions regarding pain, they will in turn have more of a sense of agency and control, which could result in higher levels of functioning.

2.7 Self-control theories and strategies

Self control strategies have been known to have a major impact on the way one perceives his or her pain. These strategies are based primarily on the social cognitive theory of Albert Bandura. According to Bandura, one's behavior is influenced by a variety of factors, including one's own thoughts and beliefs, and elements in the environment. He proposed that certain beliefs, self-efficacy and outcome expectancies, are important factors in determining which behaviors an individual will attempt, and how motivated the individual will be when engaging in those behaviors. Self-efficacy expectations represent an individual’s conviction that he or she can successfully perform the required behavior (McEntyre, 1985). Outcome expectancies are what the person believes will happen as a result of engaging in a certain behavior. If self-efficacy and outcome expectancies are inaccurate, the individual may experience behavioral deficits or excesses.
Bandura’s social cognitive theory takes a transactional view of the individual and society. In this view, personal factors such as cognitive, affective, physiological events, behavior, and the environment interact bidirectionally (Bandura, 1997). For example, if people perceive themselves as capable of taking their medication according to a treatment regimen (a cognition), they will be more likely to adhere to the regimen even in circumstances that might discourage the behavior (e.g. in the presence of a peer group). This action will confirm their self-perception (behavior-person feedback) and it may lead to their peers not teasing them for needing to self-medicate in a future similar circumstance (environmental change).

Bandura provided a view of human behavior in which the beliefs that people have about themselves are critical elements in the exercise of control and personal agency. Thus, individuals are viewed both as products and as producers of their own environments and of their social systems. People work together on shared beliefs about their capabilities and common aspirations to better their lives. The stronger the individual’s level of perceived self efficacy, the more active the coping efforts. Research has examined how efficacy impacts a wide range of behaviors such as phobias (Bandura, Adams, Hardy & Howells, 1980); vocational choice (Betz & Hackett, 1981), academic performance (Yurick, 2006) and exercise (Gleeson-Krieg, 2006).

A further view of the theory of human change is embedded in social systems that provide constraints and resources for human functioning. One of the resources social systems provide is modeling. According to the theory, social models are a source of vicarious experience for the individual. Learners can acquire an entirely new skill
(e.g. self management of pain) through observing a model. Thus, unlike the Fordyce’s operant hypothesis, social cognitive theory suggests people can learn behaviors in the absence of explicit reinforcement. However, vicarious learning alone would not be sufficient to account for individuals’ unique and generative behavioral techniques.

The social cognitive view also assumes there is a distinction between self-efficacy and motivation. A person might believe they are capable of performing a set of actions in a particular situation, but unless they perceive these behaviors will lead to a valued goal, they might not exhibit the behaviors. The perception a set of behaviors will lead to a valued goal is termed outcome expectancy, and is similar to the notion of response efficacy in protection motivation theory. Just as there is an assumed distinction between self-efficacy and motivation, so there is a distinction between outcome expectancy and motivation, for even though a person might expect a certain set of behaviors will lead to a valued goal, unless they perceive themselves as capable of performing those behaviors, they might not emit them.

Self-efficacy is one's belief about how well he or she can perform a given task, regardless of that person's actual ability. Outcome expectancies are what the person believes will happen as a result of engaging in a certain behavior. If self-efficacy and outcome expectancies are inaccurate, the individual may experience behavioral deficits or excesses.

In view of the fact self-efficacy is assumed to affect initiation of behavior, performance and persistence of behavior, it has been hypothesized self-efficacy plays an important role in self-regulatory health-related behaviors (Bandura, 1997). For
example, self-regulatory efficacy has predicted positive outcomes in the areas of reduction of blood pressure levels, diabetes (Gleeson-Krieg, 2006), arthritis (Lorig, Mazonson, & Holman, 1993), and asthma (Zimmermann, Bonner, Evans, & Mellins, 1999).

2.8 Self-regulatory models

A major assumption of the self-regulatory approach is ultimately the responsibility for the effectiveness of any treatment rests with the individual. Thus, the patient is seen as being actively engaged in dealing with her or his own health issues.

These models are similar to Bandura’s social-cognitive model to the extent they emphasize the coping appraisal processes and the effect of the resultant feedback on cognition, emotion, and behavior. To these extents, self-regulatory models can be seen as “adherence” rather than “compliance” models. Donald Meichenbaum; who developed the idea of self-instructional training, (Keefe, Dunsmore & Burnett, 1992) believed learning to control behavior begins in childhood, based on parental instruction. Children eventually control their own behavior by mentally repeating the instructions of their parents. These internal instructions may be positive or negative. Self-instructional training teaches individuals to become aware of their self-statements, evaluate whether these self-statements are helpful or hindering, and replace maladaptive self-statements with adaptive ones.

Meichenbaum’s early work on self-instructional learning pointed the way for those working with clients with problems in self-regulation. Meichenbaum gives less emphasis to the logical analysis of irrational beliefs and argues that the incidence of
irrational beliefs does not distinguish normal from abnormal populations. Rather, the two groups are said to differ in their coping response to irrational thoughts. The procedure developed by Meichenbaum places heavy emphasis on the modeling of cognitive strategies by the therapist and on assisting the individuals through operant procedures (Meichenbaum, 2001). The patient is taught self-instruction to handle each of these aspects of problem resolution and thus learns how to cope with future problems.

In this way, self-instruction can be viewed as establishing self-control over one's behavior. Meichenbaum essentially proposed that self-instruction, composed of training in guided self-talk, assisted clients by allowing them to better perform five functions: direct their attention to relevant events; interrupt an automated response to environmental stimuli; search for and select alternative courses of action; uses rules and principles to guide behavior.

Hiebert, Cardinal, Dumka and Marx (2005) conducted a study on the effects of a self-regulated relaxation program. This approach was compared with therapist-instructed relaxation and waiting list controls. Self-report anxiety measures; IPAT Anxiety Scale Questionnaire and State-Trait Anxiety Inventory for Adults (STAI) along with a psychophysiological stress profile (frontal EMG, GSR, heart rate, finger temperature monitored under relaxation and stressor conditions) were utilized pre and post treatment to determine efficacy. Self-monitored heart rate, respiration rate, and finger temperature were used to monitor home practice sessions. Subjects reported increased ability to relax and control stress; however, frontal EMG measured under
stressor conditions was the only dependent measure to confirm this perception. No between-group differences on any other dependent measures were observed.

Reliable changes on all self-monitored home practice measures were observed, suggesting that this procedure is a useful gauge of home practice.

An alternative self-regulatory model of health behavior was developed by Zimmerman, Bonner, Evans and Mellins (1999). In this model the patient is still seen as an active problem solver, but one who interacts with others (e.g. a spouse/partner, children, friends, their physician) in relation to their health problem. Thus, in this model, self regulation is envisioned as embedded within a social context.

As previously indicated, self-observation has been shown to play a major role in the development of self-regulatory efficacy. In essence, self-observation focuses attention on the behavior that is to be changed, and the antecedents and consequences of that behavior. This direction of attention on the behavior to be changed is crucial because, according to Bandura (1986), people need to know what they are doing in order to exert control over their actions. Therefore, achieving self regulation may depend on consistent, brief and immediate self monitoring.

Consistent and proximate self-monitoring may provide information about what conditions led to particular behaviors or feeling states. According to Zimmerman et al., (1999) in order for patients to be able to adjust their treatment in response to changing circumstances (i.e. be in the self-regulatory phase) they must be able to be self-observant, make self-judgments, and be self-reactive. In other words, they must exhibit self regulatory efficacy.
2.9 Self-monitoring

Based on various studies, self-monitoring has been an effective tool utilized in educational and clinical settings. Self-monitoring can also act as a motivating device by encouraging people to set goals of progressive improvement for themselves, even though they have not been explicitly asked to do so. In addition, it can provide informative feedback about progress towards those goals and general performance. Self-recording is the formal manifestation of self-monitoring. Usually, self-recording involves noting behavioral occurrences on a recording sheet, along with such features as the time, place, and duration of occurrence (Schunk, 2001; Zimmerman, Bonner, & Kovach, 1996).

Self-recording has been used as a component of many successful, multi-faceted behaviors change programs in a wide range of areas. Generally, these programs followed behavioral-cognitive models. It has also been shown to be effective, either on its own, or over and above other components in a program. In the academic arena for example, self-monitoring significantly increased students’ time on task, self-efficacy, and achievement in mathematics (Sagotsky, Patterson, & Lepper, 1978). In the area of sports, it has enhanced the development of complex motor skills (Zimmerman et al, 1996).

In health-related fields, a simple self-monitoring tool assisted obese men and women to achieve a healthy lifestyle (Miller, Wallace, Eggert, & Lindeman, 1993), and more frequent self-monitoring of blood glucose levels has been associated with better glycemic control in diabetics (Rayman & Ellison, 1998). For both smoking cessation
(Kamarak & Lichtenstein, 1988) and weight control (Perri, McAllister, Gange, et al., 1988), long-term maintenance has been associated with self-monitoring during treatment.

Experts in the behavioral treatment of chronic pain have stressed the importance of having patients self-monitor their pain on an hourly basis over a two-week period during the evaluation phase of treatment programs, in order to obtain a more accurate picture of the patient’s idiosyncratic pain experience (Turk, Meichenbaum, & Genest, 1983).

Kings-Sears (1999) reported the use self-monitoring helps provide an instructional technique that is used to transfer control of behavior to the client. While using self-monitoring strategies, one should continue to keep records regarding the occurrence of the target behavior. Keeping written records is essential for determining if the strategies are effective. If one is gradually meeting the goal requirements, the strategies may be assumed effective. If little progress towards the goal is evident, either the strategies are being used incorrectly, or the strategies are ineffective and should be changed. Self-monitoring can be done informally or formally.

In any case, self-monitoring should gather the necessary information, but should not become too lengthy or complex. The individual will lose motivation to continue monitoring if the procedures are overly time-consuming or inconvenient. Previous studies have only tangentially examined the influence of cognition on pain perception among chronic pain sufferers.
The assessment of pain fluctuations has both clinical significance as well as heuristic value. Clinical wisdom suggests greater fluctuations in pain are associated with greater psychological distress (Banks, 1997). Often if patients can learn to minimize exacerbations and manage fluctuations, their distress can be reduced. Kerns, Finn, & Haythornwaite (1988) found empirical support for this idea, observing variability in pain intensity was positively correlated with measures of depression.

The clinical assessment of fluctuations may provide a level of detail that may uncover patterns and provide clues about psychological, behavioral, and environmental precursors of pain exacerbations. This information can be used clinically to assist the patient in learning self management strategies. From a heuristic point of view, the examination of pain fluctuations may increase the understanding of the role psychological processes play in pain perception among chronic pain sufferers.

Banks (1997) examined the relative contribution of three levels of cognition appraisals of control and helplessness, positive and negative trait self-statements, and positive and negative state self-statements to the prediction of average pain, and the relationship between fluctuations in frequency of state self-statements and fluctuations in perceived pain. The two major models of chronic pain that guide current clinical practice; the Gate Control Model of pain perception and the cognitive-behavioral model of chronic pain, both emphasize the role of cognition in modulating the experience of pain and have suggested that transient, in-the-moment cognitive activity (i.e., "state self-statements") may not only be a response to pain but may also influence the amount of pain a person experiences at a given moment.
Eighty study participants with a heterogeneous mix of chronic pain problems completed self-report measures of control, helplessness, and trait self-statements, and a four-day ambulatory diary in which they made hourly ratings of pain intensity and frequency of state self-statements.

Negative State Self-Statements emerged as a significant predictor of both average pain and transient fluctuations of pain. Specifically, Negative State Self-Statements were observed to be a stronger predictor of average pain than Positive State Self-Statements, Positive and Negative Trait Self-Statements, Control, and Helplessness.

2.10 Self-Determination

The intrinsic nature of humanity shows people to be curious, vital, and self-motivated. At their best, they are dynamic and inspired, striving to learn; extend themselves; master new skills; and apply their knowledge constructively. The fact most people show considerable effort and commitment in their lives appears to be more normative than exceptional, suggesting some very positive and persistent features of human nature. In the case with chronic pain patients, through increasing their level of self esteem their negativistic thinking may decrease and may therefore lead to a more elevated sense of purpose.

Self determination theory hypothesizes people are inherently motivated to internalize the regulation of uninteresting though important activities. This theory also distinguishes two general classes of motivation behaviors, those that are self determined (i.e. governed by the process of choice and experienced as emanating from the self) and
those that are controlled (i.e., governed by the process of compliance and experienced as compelled by some interpersonal force) (Deci & Ryan, 1995).

Many different elements have been identified as components of self determined behaviors by various authors. Wehmeyer (1995) identified the following twelve components of self-determination: self awareness, self esteem, self confidence, attitudinal perceptions, self efficacy, outcome expectancy, locus of control, abilities, choice and decision making, problem identification and solving, goal attainment, and self organization. Wehmeyer categorizes the component of his list into personal perceptions, attitudinal perceptions, and abilities.

The contribution of these self determination components were examined in a study conducted by Wehmeyer and Schwartz (1998) that looked at self determination and its relationship to the level of quality of life for those with disabilities. Fifty adults with mental retardation were given a quality-of-life questionnaire which measured their level of competence/productivity, empowerment/independence, social support and belonging and overall levels of satisfaction. Self determination scores were significantly correlated with the total quality of life scores (Konrad, 2005).

Schalock and Alonso (2002) whose extensive research on the Quality of Life (QOL) initiatives that are essential in a person’s life who have disabilities have narrowed the list to eight essential elements, which are: choice making skills, problem solving skills, decision making skills, goal-setting and attainment skills, self management skills, self-advocacy and leadership skills, perception of control and efficacy, and self awareness and self knowledge.
Martin and Marshall (1995) developed the Choice Maker model, which consists of self awareness, self advocacy, self efficacy, decision making, independent performance, self evaluation, and adjustment. The concept of choice making appears in all the components of self determination models. While most of us are granted the ability to make choices for ourselves on a daily basis, this may not be true for those with chronic pain and psychiatric disabilities. Many choices are made for these individuals whether it is physicians, agencies, clinicians, or family members. The ability to make choices provides individuals with a sense of power (Schalock and Alonso, 2002). The better one becomes at making decisions that they view as having desirable outcomes, levels of self efficacy and locus of control may become more evident.

2.11 Summary of Literature

Research demonstrates those individuals who suffer from chronic pain who use positive coping styles, affirmative cognitive appraisals and use self regulatory mechanisms to monitor their reactions to pain may have a greater chance at vocational success. The role of the psychologist in managing patients with pain has received increasing attention. There is a great demand for psychologists to assist with the management of the chronic pain patient. The models and theories discussed in this chapter should help illustrate the various ways in which individuals with disabilities, both physical and psychological can improve their quality of life and achieve success.

The literature on the above topics demonstrates several important points:

1) Clinician’s attention and encouragement often functions to reinforce patient behavior, regardless of whether that attention is positive or
negative. When clinician encouragement and consistency are used to increase positive patient behavior, self efficacy and self determination levels increase.

2) The reactive effects of self-monitoring may be beneficial components of treatments to improve clinical skills. Self monitoring is a procedure than can be implemented without compromising therapeutic intervention, and has little to no time constraints. This makes it a logical and practical choice for intervention in terms of time and finances.

3) Investigations on the use of self monitoring to lower the use of negative self statements and increase potential for vocational success are limited. Further studies are needed in efforts to develop a sound literature base on which clinicians and rehabilitation professionals could base their practices in applied settings.

The present study combined research on the characteristics of the CPP as it relates specifically to those individuals involved in the Workers’ Compensation system who are candidates for return to work. Additionally, this study looked at research on self monitoring with previous research on treatment models typically used with this population. Given that research has evidenced self monitoring interventions may be more advantageous than traditional interventions, this study employed self monitoring to decrease the effects of negative self statements made during treatment sessions with the chronic pain population.
CHAPTER 3
METHOD

The purpose of this study was to examine the effects of a self-monitoring intervention on the frequency of negative self statements of chronic pain patients within the therapeutic setting. This chapter will (a) describe the setting and participants of the study, (b) define the dependent variable, (c) define the independent variable, (d) identify the experimental design and (e) describe experimental procedures.

3.1 Participants

Three subjects who have secondary psychiatric claims through the Bureau of Workers’ compensation and who have chronic pain participated in this study. These subjects met eligibility for chronic pain according to prior pain evaluations given by treating physicians. The subjects chosen for this study were of interest due to the complex pain issues and their pervasive negativistic thinking styles which surround their chronic pain and workers compensation status. This study involved two males, and one female subject.

Patient A

Patient A was a 50 year old Caucasian female who sustained an industrial injury in 1998. She was performing duties as a nurse’s aide for a local family when she slipped and fell and broke her left ankle. Patient A had a history of obesity prior to her injury
and joint pain along with secondary insomnia and poor appetite, as a direct result of her injury.

Results from clinical records, specifically the results of assessment such as the MMPI-2, Beck Depression Inventory (BDI) and the Millon Clinical Multiaxial Inventory (MCMI-III) indicated that Patient A had been diagnosed with Depressive Disorder, Not Otherwise Specified (NOS). This diagnosis included a constellation of symptoms such as anhedonia, irritability, feelings of worthlessness, poor social skills, appetite disturbance and dependent personality disorder features such as lack of assertiveness, difficulty making decisions and passivity. She appeared to fit Axis II classifications for Dependent Personality Disorder. She had a tendency to conform to convention and acted in a socially reserved manner, in spite of her strong need to depend on others. A fear of expressing emotions and losing control was evident.

Her deep emotional ambivalence may have intruded on strong desires to express long-felt resentment conflict with her fear will prompt humiliation. As a result she may have experienced a chronic state of tension often evident in functional somatic disorders. She had been receiving psychological treatment since 1998.

Patient B

Patient B was a 49 year old Caucasian male who sustained an injury while working as a prison guard in 1997. Since his injury he has been diagnosed with Major Depressive Disorder, Recurrent, Severe and Personality Disorder Not Otherwise Specified. The results of assessments such as the MMPI-2, the Beck Depression
Inventory (BDI) and the Millon Clinical Multiaxial Inventory (MCMI-III) documented in Patient B’s clinical records indicated that he had a history of unstable relationships, suicidal ideation, persecutory thoughts and feelings of hopelessness and worthlessness. He appeared to fit the following Axis II classifications best: Dependent Personality Features, and Avoidant Personality Traits. Patient B’s personality profiles suggest anxious conformity to the expectations of others. There was over concern with minor irrelevancies that served to distract his attention from his deep feelings of inadequacy.

Patient B’s medical records indicated his injury resulted in severe lower back damage and joint pain. He had been receiving psychological treatment since his injury in 1997 and felt it helped him but reported that over the past 6 months he was experiencing an increase in negative symptoms.

Patient C

Patient C was a 37 year old African American male who sustained an industrial injury in 1999 while working as a technician at an auto parts store. His injuries involved severe lower back strain which eventually led to hip replacement surgery in 2005. The results of assessments such as the MMPI-2, the Beck Depression Inventory (BDI) and the Millon Clinical Multiaxial Inventory (MCMI-III) indicated he had increased depressive symptoms and anxiety. Patient C had been diagnosed with Dysthymia and Generalized Anxiety Disorder. Symptoms included feelings of worthlessness, hopelessness, social isolation, negativistic thinking and panic attacks. No Axis II classifications were indicated with this individual. Patient C started psychological treatment in 1999 for a duration of 1 year, then recently returned in August 2006 for
treatment due to an increase in depressive symptomatology, specifically irritability, anhedonia and demoralization.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Gender</th>
<th>Age</th>
<th>Race</th>
<th>Type of Injury</th>
<th>Clinical Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brenda</td>
<td>Female</td>
<td>50</td>
<td>Caucasian</td>
<td>Broken Left Ankle</td>
<td>Depressive Disorder NOS</td>
</tr>
<tr>
<td>Dale</td>
<td>Male</td>
<td>49</td>
<td>Caucasian</td>
<td>Severe Lower Back Damage/ Degenerative Disc disease</td>
<td>Major Depressive Disorder/Recurrent/Severe</td>
</tr>
<tr>
<td>Dana</td>
<td>Male</td>
<td>37</td>
<td>African American</td>
<td>Severe Lower Back Strain/Hip Displacement-</td>
<td>Generalized Anxiety Disorder Dysthymia</td>
</tr>
</tbody>
</table>

3.2 Setting

This study was conducted in a psychologist’s private practice that serves those with Bureau of Workers Compensation claims. The private practice was located on the west side of the city, in a lower socioeconomic neighborhood. The practice was comprised of four psychologists, one psychology intern and one psychiatrist. The office in which the researcher conducted the study was in the annex office. It is located in a building that had a medical clinic, dental clinic and a pharmacy and served mostly low-income families on Medicaid, and Medicare. A small percentage of the population seen in psychotherapy had private insurance. The office in which therapy was conducted was average in size, with a separate room for the secretary and a large room therapy room, with a couch and two chairs. This room was solely used for conducting therapy and other experimental sessions.
3.3 **Researcher background**

The primary researcher was a doctoral candidate in Rehabilitation Counseling and holds a Bachelors degree in psychology and two Masters Degrees, one in Clinical Psychology from the Illinois School of Professional Psychology in Chicago, Illinois and the other in Rehabilitation Counseling from the Ohio State University in Columbus, Ohio. She had six years of clinical psychotherapy experience, in hospital, school and private practice settings. She also had two years of graduate teaching experience and worked as a psychology intern with the Association for Psychotherapy. Her responsibilities included conducting pre-employment assessments for law enforcement agencies statewide, providing psychotherapy for various populations such as children, adults, groups and those who had a current psychiatric claim through the Bureau of Workers’ Compensation.

A secondary data observer participated in this study in order to ensure integrity of the dependent variable. She served as a secondary observer for probes of implementer integrity and also for interobserver agreement on the dependent variable. This data collector was trained prior to collecting data independently. The first training session involved having the secondary observer and the experimenter listen to an audiotape of a participant. The experimenter used the cassette player, the stopwatch, and the data sheet and used the same data sheets as the experimenter, and recorded all negative statements pain related and non pain related. The experimenter gave the secondary data observer a set of data collection materials (audiotapes, data collection
sheets, stopwatch, and cassette player) and instructed her to score sessions on her own after the training session.

After this, the secondary data collector/observer returned the audiotapes and the completed data sheets and compared them to the experimenters. Any discrepancies in the recording were discussed with the data collector in order to clarify the observed behavior and the behavioral definitions. The training of the secondary observer continued until agreement scores were above 85% across target behaviors for three consecutive sessions. If agreement was below 85% for two consecutive sessions, the experimenter and the data collector reviewed and discussed examples and non-examples of the definitions of the dependent variables until agreement was achieved. Interobserver agreement (IOA) of frequency was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100 to produce a percent agreement score. IOA was assessed on 30% of all sessions, across phases.

3.4 Definition and Measurement of the Dependent Variable

The primary dependent variable in this study was the number of negative self statements (NSS) made during a therapy session. Negative self statements included any verbal statement that suggests helplessness, poor work attitude, poor work ethic, or otherwise self defeating statements. Examples included: “I’ll never be able to get a job”, “I’m in too much pain to work”, etc. Negative self statements were categorized into two areas: pain-related and non-pain related. The categories of the dependent variable are operationally defined below.
Pain-related negative self statements (PRS). PRS included any verbalization related to the individual’s history of chronic pain that indicates poor outcomes, both past and future. In order to be scored as an occurrence, PRS must have contained both an ongoing qualifier of the outcomes (e.g. always been, will never be able to, can’t, shouldn’t, used to be able to but can’t, etc.) in direct relation to the individual’s own chronic pain condition. A PRS did not include neutral qualifiers (e.g., ok, don’t mind, doesn’t matter, etc.) or positive outcome qualifiers (like it if, want to, could, it’s possible that etc.) and did not include any non-pain related statements or any statements regarding pain in general, but not specific to the individual’s own condition and history.

Examples of PRS included:

- Nobody understands my pain
- I never seem to have relief from pain
- It’s no use. I cant do anything about the pain I have
- I'm not worth anything because of my pain issues

Nonexamples of PRS included:

- My sister seems to have trouble getting BWC to cover her injury
- My social security benefits may be taken away
- Some guy in the lobby says his medications were cut off from BWC

3.5 Generalization Measures

Prior to collecting baseline data, the researcher assessed each patient’s depression levels using the Beck Depression Inventory (BDI). The BDI is a 21 item self-report rating inventory measuring characteristic attitudes and symptoms of depression.
The BDI takes approximately 10 minutes to complete, and clients require a fifth – sixth grade reading age to adequately understand the questions. Internal consistency for the BDI ranges from .73 to .92 with a mean of .86. (Beck, Steer & Brown, 1996). The BDI demonstrates high internal consistency, with alpha coefficients of .86 and .81 for psychiatric and non-psychiatric populations. The content of the BDI was obtained by consensus from clinicians regarding symptoms of depressed patients (Beck et al., 1961).

Groth-Marnat (2003) reports that the revised BDI discriminates Psychiatric patients from non-psychiatric patients as well as relatively higher scores for patients with major depressive disorder compared to patients with dysthymic disorders. The revised BDI has also been used to discriminate loneliness, stress and self reported anxiety.

*Total score Levels of Depression*

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 - 09</td>
<td>Ups and downs are considered normal</td>
</tr>
<tr>
<td>10 - 18</td>
<td>Mild to moderate depression</td>
</tr>
<tr>
<td>19 - 29</td>
<td>Moderate to severe depression</td>
</tr>
<tr>
<td>30 - 63</td>
<td>Severe depression</td>
</tr>
</tbody>
</table>

Below 4 = Possible denial of depression, faking good; this is below usual scores for normals.

Over 40 = This is significantly above even severely depressed persons, suggesting possible exaggeration of depression; possibly characteristic of histrionic or borderline personality disorders. Significant levels of depression are still possible (Groth-Marnat, 2003).
Each participant was taken to a quiet area individually to complete the questionnaire. The researcher told each participant that the questionnaire was to assess their current level of depressive symptoms and that their results would not affect his or her participation in the study. The test was administered and yielded total depression scores. The total testing time for each patient was approximately ten to fifteen minutes.

3.6 Definition and Measurement of the Independent Variables

This study included self-monitoring as the independent variable (I.V.). The independent variable is operationally defined below.

*Self monitoring (SM)*. SM is a general term that indicates any procedure in which an individual can detect occurrences of a specific behavior and reliably record that occurrence. Cooper, Heron, and Heward (2007) define self-monitoring as, “the personal and systematic application of behavior change strategies that result in the desired modification of one’s own behavior”. (p. 517) According to B. F. Skinner, SM involves at least two responses: (a) controlling behavior, which is behavior the person emits in order to increase the probability that he or she will emit the target behavior (e.g., placing the outgoing mails with your car key the night before) and (b) controlled behavior, which refers to the target behavior under control (e.g. mailing the letters out).

In this study the controlling behavior involved accurately marking a self-monitoring card for each occurrence of NSS in the 30 minute therapy session. The controlled behavior was any occurrence of the dependent variable (as previously defined).
Prior to the introduction of the independent variable, the subjects were provided direct instruction and training on identification and recording of occurrences of NSS. In order to begin intervention, the subject and primary researcher had to correctly identify and reliably record 10 consecutive examples of a NSS with 100% accuracy. Training continued until this criterion was reached. The self-monitoring strategy was frequency recording on a 3 X 5 index card of all pain related negative statements per 30 minute session.

3.7 Treatment Integrity

In order to determine if the intervention was being applied as prescribed in this study, treatment integrity needed to be considered. Treatment integrity, also known as procedural integrity or procedural reliability, is established when the researcher collects data to verify that a given treatment has been implemented as intended.

Treatment integrity data provides evidence on the treatment implementation that may lend credibility to the observed effects. Often, in clinical intervention research, treatment integrity data are collected by directly observing the intervention and keeping record of whether or not important characteristics of the treatment were observed. Treatment integrity was used to strengthen the treatment effects of the I.V.

3.8 Materials

Tape recorders

One Panasonic RN-305 micro cassette recorder was used in the study. The investigator used one tape recorder during each treatment session to record statements and tallied them outside the therapy session in order to avoid compromising the quality
of the ongoing treatment of clinical issues. During baseline, the micro cassette tapes of sixty-minute duration were used to record the subject’s negative pain related statements. During intervention, each subject’s negative pain related responses was recorded on the investigators micro cassette tape of the same type. Each tape was clearly labeled with the subject’s name and beginning and ending dates.

Subject folders

The researcher created folders for each subject that contained a standard graph created in Microsoft Excel on which subjects scores were recorded. A log sheet documenting all negative statements recorded during sessions is in the folder, all of which the researcher created from the program Microsoft Word, was included in the folder.

3.9 Experimental Design

This study used an ABAB reversal design. This design was selected to determine a functional relationship between the target behaviors and the independent variable. This reversal design involves the repeated measurement of behavior in a given setting during four consecutive phases of an experiment: 1) Baseline phase in which the independent variable was absent. The primary purpose for establishing a baseline is to use the subject’s performance in the absence of the independent variable as an objective basis for evaluating the effects of the independent variable (Baer, Wolf and Risley, 1968).

Systematic observation with a treatment variable provides the opportunity to look for and note environmental events that occur just before and just after the behavior
(Cooper et al, 2007). Once a stable baseline has been reached, treatment intervention begins in order to accurately determine a functional relationship between pain statements and change in attitudes in this particular study.

2) Intervention phase during which the independent variable is introduced 3) a return to prior baseline conditions characterized by withdrawal of the independent variable and 4) return to the intervention phase.

The A-B-A-B reversal design is the most straightforward and powerful single-subject design for demonstrating a functional relationship between an environmental manipulation and behavior (Cooper et al, 2007). When a functional relationship is revealed with a reversal design, the data tell how the behavior works. Using an A-B-A-B design has several advantages. This includes the process of withdrawing a particular treatment which reverses the target behavior to baseline, or preintervention levels. There are times when the target behavior could be maintained after the treatment is withdrawn due to factors that link the natural environment. If the criteria for reversibility of the behavior and treatment can be met, the withdrawal design is a powerful design that documents the functional relationships between the independent and dependent variable. There are times when behaviors are not reversible such as learned behaviors or academic exercises for example, riding a bike, and learning one’s ABC’s.

3.10 Advantages of single subject design

Single-subject methodology is an approach to determine the effect of an intervention on an individual. Acceptable single-subject study designs are based on
repeated controlled application of the intervention to demonstrate its effectiveness and the use of appropriate control conditions. In studying specific behavioral interventions, single-subject design methods have the following advantages (Kazdin, 1998).

- Being compatible with and complementing group research
- Addressing the confounding variables present in anecdotal or simple case studies (such as the effects of development and maturation, behavior variation and reactivity, coincidental events, measurement error, expectation and unintended observer bias)
- Examining the specific relationship between the intervention and directly observable and quantifiable change displayed by the individual receiving intervention
- Following a methodology that can be specifically replicated by other clinicians and researchers
- Being flexible and able to adapt to the individual and interventions that are under study.

3.11 Data Analysis

Single subject research is experimental rather than correlational or descriptive, and its purpose is to document causal, or functional, relationships between independent and dependent variables. This type of design requires more than an isolated incident of demonstrated causation; it demands establishment of a functional (or predictable) relationship between variables(s) and behavior (Marchant, Renshaw & Young, 2006)
and to experimentally determine effects of an intervention on a single participant.

Single subject research employs within- and between-subjects comparisons to control for major threats to internal validity, and requires systematic replication to enhance external validity. Single-subject design studies involve systematically observing and recording an individual's specific behaviors. Repeated measurements of the behavior (the frequency of the behavior within a discrete period of time) are then recorded on a graph. Patterns are visually analyzed to determine if the changes in behavior are due to the intervention. Visual analysis is the primary method of determination of a functional relationship and the strength of the experimental control.

The traditional approach to analysis of single subject research involves systematic visual comparison of responding within and across conditions (Parsonson & Baer, 1978). Documentation of experimental control requires assessment of all conditions within the design. Each design (e.g., reversal, multiple baseline, alternating treatment) requires a specific data pattern before the researcher can claim that change in the dependent variable is a function of manipulation of the independent variable, and only manipulation of the independent variable.

Functional relationships demonstrate the researcher has confidence that the behavioral change is due to the intervention and not for other likely reasons (Tawney & Gast, 1984). Single subject designs add a sophisticated method for establishing functional relationships by ensuring control over environmental variables which may affect the target behavior. The intervention (or phases of intervention) is introduced while other variables are held constant one can isolate a particular phase to determine if
it is responsible for changing behavior. Without such experimental control the researcher might make the mistake of attributing an improvement or change in the target behavior to either external environmental variables rather than the intervention in effect. Single subject design may help researchers avoid these errors.

Documentation of a functional relationship requires repeated demonstrations of an effect (Parsonson & Baer, 1978). Demonstration of a functional relationship is compromised when (a) there is a long latency between manipulation of the independent variable and change in the dependent variable, (b) mean changes across conditions are small, and/or similar to changes within conditions, and (c) trends do not conform to those predicted following manipulation of the independent variable.

Concepts such as prediction, verification and replication are critical in measuring a functional relationship. Prediction is defined as “the anticipated outcome of a presently unknown or future measurement” (Johnston & Pennypacker, 1980). Verification demonstrates a prior level of baseline responding would have stayed the same if the independent variable was not introduced (Cooper et al, 2007).

This verification process seeks to reduce the probability that some extraneous variable contributed to the observed behavior change. Lastly, the replication process simply states that by repeating independent variable manipulations conducted previously in a study will produce similar outcomes. There are two significant purposes to having replication in a study. The first is by replicating a behavior change previously observed reduces the likelihood that a variable other than the independent variable was responsible for the now twice-observed behavior change. Second, replication
demonstrates the reliability of the behavior change, and therefore it shows it can happen again.

3.12 Data Collection Procedures

Participants were observed under four conditions: 1) Baseline Phase A 2) Intervention Phase A; 3) Baseline Phase B 2; and 4) Intervention Phase B

Baseline Phases

Both baseline phases were conducted two times a week, 30 minutes each session totaling 1 hour per week. The investigator set a timer to delineate 30 minute segments and used a stopwatch to measure accrued time in which negative statements were made.

The investigator conducted therapy sessions as per a typical session. The investigator did not use any behavior management during baseline observation and recording. Self monitoring activities were not utilized during baseline phases.

3.13 Intervention Phases

Prior to the intervention phases, each participant was trained to monitor his or her behavior according to the procedures developed. The investigator introduced the self monitoring procedures and instructions on how to track their own behavior. A list of examples of negative statements was used to demonstrate which statements needed to be documented. Intervention phases were conducted until data was sufficiently stable to serve as the basis for experimental comparison. Participants were trained to 85% similar to that of IOA.
3.14 External and Internal Validity

A primary concern regarding the validation of clinical interventions is the extent to which an effect documented by one study has relevance for participants, locations, materials, and behaviors beyond those defined in the study (Horner, Carr, Halle, McGee, Odom & Wolery, 2003). The external validity of results from single subject research is enhanced through replication of the effects, across different participants, different conditions, and/or different measures of the dependent variable.

The extent to which a study’s results can be generalized to other people or settings reflects its external validity. Typically, group research using randomization will initially possess higher external validity than will studies (e.g., case studies and single subject experimental research that do not use random selection or assignment (Campbell & Stanley, 1966).

External validity is also enhanced in single subject research design through the use of explicit description of the participants, the context in which the study is conducted, and the factors influencing participants behavior prior to intervention; such as assessment and baseline response patterns (Birnbauer, 1981).

In single-subject research (e.g., ABAB or multiple baseline), internal validity attempts to answer the question, "was it the treatment that caused a change in the subject's behavior, or could it have been a result of some other factor?" Single-subject experimental studies almost always have high internal validity because subjects serve as their own controls.
3.15 Social Validity

In applied research it is important to evaluate the acceptability of interventions. Three areas should be assessed for acceptance: the target behavior, the procedures used to change that behavior, and the importance of the results obtained (Wolf, 1978).

The patients' and/or consumers' opinions are important since their level of enthusiasm about a particular intervention can influence how engaged they are in treatment. Participants anonymously completed questionnaires that asked how they felt about the variables, whether they felt the self-monitoring techniques were helpful, and how the quality of their self-statements improved. They responded to each question using a 5-point Likert scale. See Appendix C.
This chapter reports the results of the study for each of the participants. Several sets of data are presented in this chapter. These data include mean number of negative statements made in baseline and intervention, along with pre and post test scores on the Beck Depression Inventory. The graphs presented at the conclusion of the chapter are presented individually, showing the total number of negative self statements made, along with pain related and non pain negative statements. Visual analysis was used to determine whether or not each patient was ready to move on from baseline to treatment conditions, the stability of each patient’s responses were examined for stability.

4.1 Baseline Patient A

Patient A had four sessions of initial baseline. The mean number of negative pain related self statements made during the initial baseline condition were 27.3 statements per session, with a range between 26 and 28. The mean number of non-pain related negative self statements made during the initial baseline condition was 15 statements per session, with a range between 14 and 16.

During the return to baseline the mean number of negative pain related self statements made during the repeated baseline condition were 24 statements per session, with a range between 18 and 31. The mean number of non-pain related negative self
statements made during the repeated baseline condition was 19.3 statements per session, with a range between 12 and 26.

4.2 Intervention Patient A

Patient A had five sessions of intervention. The mean number of negative pain related self statements made during the initial intervention were 10.6 statements per session, with a range between 6 and 16 negative self statements. The mean number of negative non-pain related self statements made during the initial intervention was 7.2 statements per session, with a range between 2 and 12 negative self statements.

During return to Intervention, the mean number of negative pain related self statements made were 9.75 statements per session, with a range between 5 and 15 negative self statements. The mean number of negative non-pain related self statements made during the return to intervention were 6 statements per session, with a range between 4 and 10 negative self statements.

4.3 Baseline Logic

The prediction, verification and replication of responding is necessary to satisfy baseline logic. If Patient A stayed in Baseline and all environmental conditions remained constant, the prediction would be that Patient A’s negative self statements would remain elevated. This prediction was verified by the similar elevation of responding observed in Baseline 2. Finally, the replication of the treatment effects was demonstrated by similar low level patterns of responding during both Intervention phases.
4.4 Results of the Beck Depression Inventory Patient A

Pre-test score of Patient A’s BDI assessment was 31, which indicates a severe level of depression. The BDI post-test score revealed an elevated score of 40, suggesting a severe level of depression remained for Patient A after self monitoring.

![Negative Self Statements-Patient A](image)

Figure 4.1: Number of NSS made by Patient A
Figure 4.2: Number of NPRS and PRS made by Patient A

Patient A’s pattern of responding during both Baseline phases tended to be high and stable (see Figure 2). However, although still elevated, the return to Baseline was slightly less pronounced than the initial Baseline. Since Baseline 2 followed the introduction of the intervention, it is possible that carryover or practice effects may have affected responding. Practice effects refer to improvements in performance that are a result of repeated exposure to the intervention.

The initial decrease during Intervention 1 appeared to be more dramatic. This is evidenced by the significant decrease in negative self statements made during this phase.
Following the initial Baseline phase, a dramatic reduction in negative self statements was observed during the first intervention phase. During the second intervention phase, the reduction in negative self statements was replicated. Furthermore, Patient A’s responding during the second intervention phase demonstrates a decreasing trend. This trend may suggest generality of treatment effects. That is, the therapeutic effect of the intervention may be maintained over time after the withdrawal of the treatment. The vertical distance between response patterns in Baseline and Intervention suggest a strong functional relationship for Patient A.

4.5  **Baseline Patient B**

Patient B had four sessions of initial baseline. The mean number of negative pain related self statements made during the initial baseline condition were 20 statements per session, with a range between 16 and 24. The mean number of non-pain related negative self statements made during the initial baseline condition was 17.8 statements per session, with a range between 14 and 20.

During the return to baseline the mean number of negative pain related self statements made during the repeated baseline condition were 12.8 statements per session, with a range between 9 and 17. The mean number of non-pain related negative self statements made during the repeated baseline condition was 14.25 statements per session, with a range between 9 and 19.

4.6  **Intervention Patient B**

Patient B had five sessions of intervention. The mean number of negative pain related self statements made during the initial intervention were 9.6 statements per
session, with a range between 4 and 14 negative self statements. The mean number of negative non-pain related self statements made during the initial intervention was 7 statements per session, with a range between 4 and 10 negative self statements.

During return to Intervention, the mean number of negative pain related self statements made were 9.8 statements per session, with a range between 8 and 14 negative self statements. The mean number of negative non-pain related self statements made during the return to intervention were 7 statements per session, with a range between 6 and 10 negative self statements.

4.7 Baseline Logic

The prediction, verification and replication of responding are necessary to satisfy baseline logic. If Patient B stayed in Baseline and all environmental conditions remained constant, the prediction would be that Patient B’s negative self statements would remain elevated. This prediction was verified by the similar elevation of responding observed in Baseline 2. Finally, the replication of the treatment effects was demonstrated by similar low level patterns of responding during both Intervention phases.

4.8 Results of the Beck Depression Inventory Patient B

Pre-test score of Patient B’s BDI assessment was 32, which indicates a severe level of depression. The BDI post-test score revealed an elevated score of 43, suggesting a severe level of depression remained for Patient B after self monitoring. This score is considered to be significantly above even severely depressed persons, suggesting possible exaggeration of depression; possibly characteristic of histrionic or
borderline personality disorders. Significant levels of depression are still possible however.

Figure 4.3: Number of NSS made by Patient B
Patient B’s pattern of responding during the initial Baseline phases was high with the repeated baseline phase somewhat lower yet stable (see Figure 4). The return to Baseline was slightly less pronounced than the initial Baseline. Since Baseline 2 followed the introduction of the intervention, it is possible that carryover or practice effects may have affected responding. Practice effects refer to improvements in performance that are a result of repeated exposure to the intervention.

4.9 Baseline Patient C

Patient C had four sessions of initial baseline and four sessions of repeated baseline. The mean number of negative pain related self statements made during the
initial baseline condition were 29.75 statements per session, with a range between 34 and 24. The mean number of non-pain related negative self statements made during the initial baseline condition was 24 statements per session, with a range between 28 and 16.

During the return to baseline the mean number of negative pain related self statements made during the repeated baseline condition were 25.25 statements per session, with a range between 18 and 34. The mean number of non-pain related negative self statements made during the repeated baseline condition was 16.75 statements per session, with a range between 11 and 23.

4.10 Intervention Patient C

Patient C self monitored both pain related and non-pain related negative self statements during the repeated self monitoring conditions over nine sessions. Patient C made an average of 12.4 pain related negative self statements per session with a range between 11 and 14. Patient B made an average of 13.2 non-pain related negative self statements with a range between 9 and 18.

During return to Intervention, Patient C made an average of 6.25 pain related negative self statements per session with a range between 3 and 10. Patient B made an average of 8.75 non-pain related negative self statements with a range between 3 and 10.

4.11 Baseline Logic

The prediction, verification and replication of responding is necessary to satisfy baseline logic. If Patient A stayed in Baseline and all environmental conditions
remained constant, the prediction would be that Patient A’s negative self statements would remain elevated. This prediction was verified by the similar elevation of responding observed in Baseline 2. Finally, the replication of the treatment effects was demonstrated by similar low level patterns of responding during both Intervention phases.

4.12 Results of the Beck Depression Inventory

Pre-test score of Patient C’s BDI assessment was 40 which indicate a severe level of depression. The post score on the BDI assessment for Patient C was 35, indicating a severe level of depression that was 5 points lower than the initial score of 40.

![Figure 4.5: Number of NSS made by Patient C](image-url)
Patient C’s pattern of responding during both Baseline phases tended to be high and stable (see Figure 2). However, although still elevated, the return to Baseline for non-pain related statement was slightly less pronounced than the initial Baseline. Since Baseline 2 followed the introduction of the intervention, no evidence of practice effects may have affected responding.

4.13 Social Validity

Once the intervention was discontinued, a social validity measure in the form of a questionnaire was given to each patient. The purpose of the social validity
questionnaire was to assess participant opinion of the self monitoring procedures and the study as a whole. It was also used to determine to what extent participants would consider using this procedure in the future. The questionnaire presented eleven statements about the procedures, effects and goals. Respondents indicated the extent to which they agreed or disagreed with the statements on a Likert-type scale. The patients were also asked to share any additional comments about the procedure in the form of a free response item that concluded the questionnaire. All three participants completed the questionnaire. The primary researcher collected the social validity responses. The results of the questionnaires follow.
Patient Intervention Rating Profile

Name: Patient response composite                                      Date of completion: 8/31/07

INSTRUCTIONS: Please read each statement below. Then decide how much you agree or disagree with it. Put a checkmark in the box that shows how much you agree or disagree with the statement.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
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<tr>
<td>1. I feel I was adequately informed about this study and all it entailed</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>2. I think self monitoring (SM) procedures made therapy more effective</td>
<td>Strongly Agree</td>
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<td>3. I would like to continue participating in the SM of negative self</td>
<td>Strongly Agree</td>
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<td>statements in future</td>
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<td>4. I feel the practice training session of SM was useful</td>
<td>Strongly Agree</td>
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<tr>
<td>5. I feel the quality of my self statements have improved</td>
<td>Strongly Agree</td>
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<td>6. I think the SM procedure helped me make less negative statements</td>
<td>Strongly Agree</td>
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<td>7. I think the SM procedures helped me make less negative statements about</td>
<td>Strongly Agree</td>
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<td>my pain</td>
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<td>8. I feel it is important to decrease the number of negative self</td>
<td>Strongly Agree</td>
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<td>statements I make</td>
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<td>9. I feel the SM intervention will help me return to work</td>
<td>Strongly Agree</td>
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<td>10. I plan to use the SM of negative self statements on my future job</td>
<td>Strongly Agree</td>
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<td>11. Please feel free to share any additional comments you may have about</td>
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<td>to in therapy about my pain and keeping score of that helped me, gave</td>
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<td>me confidence”</td>
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CHAPTER 5
DISCUSSION

Researchers have begun to acknowledge the importance of psychological factors that may contribute to the development of chronic pain, the role in level of disability, and their potential role in intervention (Gatchel, Robinson & Stowell, 2006). With the increase in industrial and psychological claims within the Workers Compensation system, methods of understanding and treating those consumers with chronic pain who have psychiatric disability along with ability to return to work has been an area not fully investigated.

The aim of this study was to examine the effects of self monitoring on three workers’ compensation patients who have chronic pain and psychiatric disability. These subjects met eligibility for chronic pain according to prior pain evaluations given by treating physicians. The subjects chosen for this study were of interest due to the complex pain issues and their pervasive negativistic thinking styles which surround their chronic pain and workers compensation status.

Specifically, the study analyzed the occurrence of negative self statements made during baseline in which the patients engaged in psychotherapy sessions, and also during intervention where the patients engaged in self monitoring of their negative self statements during these psychotherapy treatment sessions. The dependent variables
measured in both baseline and intervention were the number of negative self statements made, both pain related and non-pain related.

This study involved two males, and one female subject. Psychiatric disability was determined through results from clinical records, specifically the results of an assessment battery which included the MMPI-2, BDI and MCMI-III. Overall, participation in the self monitoring procedures was found to be beneficial not only for total number of negative statements made but for pain and non-pain related negative self statements. Treatment quality and duration did not account for a substantial proportion of the variance, but warrants further investigation due to some design constraints of the study. The findings of the study are discussed as they relate to the conceptual framework, assumptions of the study, and current literature. This discussion is limited by the fact that no known published research examines the effect of a program that uses self monitoring within both rehabilitation and psychology, specifically those involved in the Workers Compensation arena.

All patients who received treatment made practical, meaningful gains on abilities to decrease the amount of negative self statements made in each session as reflected by the strong functional relationships shown in the data paths. Only one of three patients demonstrated lowered depressive symptoms in pre and post test scores on the Beck Depression Inventory (BDI). One patient had scores that were significantly elevated.

This suggests possible extraneous variables contributing to this patient’s depressive symptomatology. Another important finding from this study was that other
variables did not account for a significant amount of variance as prior research studies have suggested. For example, the literature has reported the workers in their studies who had prior surgery were not likely to return to work (Lancourt & Kettlehut, 1992; Polatin et al, 1989; Rohling et al, 1995). It appeared with this group of subjects, all of which had prior surgery; interest in returning to work was not compromised.

Researchers have suggested strategies for consumers struggling with chronic pain involved in rehabilitation with psychiatric disabilities, but no previous empirical studies on the injured worker population using this approach have been conducted. There are no specific findings, therefore, against which to compare the results of this study.

The following section includes a discussion of the results obtained as they relate to each of the research questions presented in Chapter 1. Also included in this chapter are the limitations of the study, implications for clinical use, and directions for future research.

The purpose of this study was to investigate the effects of self monitoring of negative self statements for chronic pain patients. Three chronic pain patients with Workers’ Compensation claims served as the participants. The experiment used a reversal design to determine the relationship between the intervention and the dependent variables. The findings of this study demonstrated a functional relationship between the amount of negative self statements made during baseline and during intervention.
5.1 Research Question #1

What are the effects of a self management procedure for workers’ compensation consumers with chronic pain, on the negative self statements made in 30 minute therapy sessions two times a week?

Cognitive behavioral clinicians have long contended modifying of negative self appraisals with positive or balanced alternatives leads to positive changes in ones affective state, behavior and adaptive functioning (Meichenbaum, 2001).

Patients diagnosed with chronic pain and comorbid diagnoses of anxiety and depression participated in this study and appeared to have benefited from the intervention. The results of this study suggest the patients lowered the amount of negative self statements made during each of the self monitoring interventions than during baseline. Each of the three participants demonstrated the ability to lower the amount of both pain related and non-pain related negative self statements. Figures 1, 3 & 5 present the number of occurrences during each therapy session.

Though the number of negative self statements made per therapy session decreased on average for each patient through each successive intervention, some of the return to baseline levels were not as elevated. This suggests possible occurrence of treatment effects, which suggest the patients began to internalize the treatment intervention during the second baseline phases.

All of the participants in this study decreased their levels of negative self statements with each intervention. Patient A lowered her statements from initial baseline level of 42.3 to 15.8 occurrences of total negative statements after the final
intervention. Patient B lowered his total negative statements from initial baseline level of 34 to 16.8 occurrences of total negative statements after the final intervention. Lastly, Patient C demonstrated the greatest trend in decreasing total negative statements, with initial baseline level at 53.8 to 15 overall occurrences of total negative self statements at the final intervention phase.

The data did not illustrate the need for further sessions on each successive self monitoring intervention. Additional data points however may have been useful to demonstrate more variability in the data but the functional relationship for each patient was relatively strong for each patient with the data points shown. Overall, patients self monitoring efficacy was increased and occurrences of negative self statements were decreased throughout the study.

5.2 Research Question #2

What are the effects of a self management procedure for chronic pain patients on the negative pain- related self statements made in 30 minute therapy sessions two times a week?

According to Turk et al (1995), it it’s not necessarily the coping strategy that plays an important role in the pain level of the patient but the patient’s attitude about the treatment approaches for the management of pain that determines whether the treatment modality used is effective. Two of the participants in this study decreased their levels of negative self statements with each intervention, specifically the level of pain related negative self statements. Patient A lowered her statements from initial baseline level of 27.3 to 9.75 occurrences of negative pain related statements after the final intervention.
Patient C lowered his negative pain related statements from initial baseline level of 29.75 to 9.8 occurrences of negative pain related statements after the final intervention. Though these patients demonstrated the greatest trend in decreasing statements, Patient B remained fairly stable during initial baseline and intervention 2.

5.3 **Research Question #3**

Will there be improvements in the level of depression for chronic pain patients following a self management intervention?

Prior to collecting baseline data, the researcher assessed each patient’s depression levels using the *Beck Depression Inventory (BDI)*. Once the study was completed, the researcher assessed each patient’s depression levels to determine whether or not improvements in the level of depression for each of these patients were made.

Patient A initially scored a 31 on her BDI pre-test and a 40 on her post test, with both scores falling within the severe depression range. Patient B initially scored a 32 on his BDI pre-test and a 43 on his post-test, which may suggest possible exaggeration of symptoms for any score elevated beyond that of 40 is possibly characteristic of histrionic or borderline personality disorders. Patient C initially scored a 40 on his BDI pre-test and a 35 on his post test. While falling within the severe depression range, the score lowered five points, suggesting slight improvement.

Ash & Goldstein (1995) found that workers compensation patients with a score greater than 16 on the BDI were less likely to return to work. While all of the subjects in this study had scores well above 16, neither intervention appeared to have had a
significant impact on depressive symptomatology as measured by the Beck Depression Inventory (BDI). An examination of the pre-test scores for the BDI across all subjects revealed that participant scored in the mild-to-moderate range of depression. Thus, if participants were not severely depressed to begin with, post-test differences would be less remarkable. An alternative explanation may be that depression is a more enduring feature of individuals who suffer with chronic pain. It is possible that better results might have been achieved by a treatment that was geared towards direct modification of depressive symptoms.

5.4 Research Question #4

To what extent will consumers on workers’ compensation who have chronic pain approve of the interventions’ effectiveness for decreasing negative self statements?

Issues of non-compliance with subscribed treatment techniques have been a primary barrier in efforts to return injured workers to gainful employment. Making therapy more efficacious for CPP’s is a likely goal for many clinicians. Therefore, the question of patient satisfaction of the self monitoring procedures is merited in the context of this study. Self control strategies have been known to have a major impact on the way one perceives his or her pain (Bandura, 1977). The very nature of self monitoring emphasizes self efficacy and self regulation. Self-monitoring has been an effective tool utilized in educational and clinical settings. It can act as a motivating device by encouraging people to set goals of progressive improvement for themselves, even though they have not been explicitly asked to do so.
In addition, it can provide informative feedback about progress towards those goals and general performance. Self determination theory hypothesizes people are inherently motivated to internalize the regulation of uninteresting though important activities. In the case with chronic pain patients, increased levels of self regulation and self esteem may contribute to a decrease negativistic thinking and may lead to more predictable and improved outcomes.

The author suggests that patients in this study were excited by the progress they were making in decreasing their negative statements and that the use of self monitoring served as a strong means of motivation to continue making progress in therapy and eventually return to work. The built-in opportunity for daily success in decreasing negativistic thinking can be very rewarding to chronic pain patients.

The responses collected on the social validity questionnaires in this study support the above mentioned theories relate to self efficacy, self regulation and self determination. The questionnaire presented several statements about the self monitoring procedures to the patients. Each patient responded with the extent to which they agreed or disagreed with the statements. All of the participants stated that they agreed or strongly agreed with the following statements:

i. I felt as though I was adequately informed about this study and all it entailed

ii. I feel it is important to decrease the number of negative self statements I make
Two out of three patients agreed that the quality of their self statements have improved and that self monitoring procedures helped make therapy more effective for them. One of three participants offered additional comments at the conclusion of the questionnaire. That comment was “I felt that talking to about my pain and negative statements helped me and gave me confidence”. Overall the patient responses to the questionnaire were positive and did not indicate disapproval of any element of the self monitoring process.

5.5 Implications for practice

There are several advantages to using self monitoring in clinical practice and in vocational rehabilitation. First, patients and/or consumers can demonstrate levels of treatment effects, extending the efficacy of self monitoring to job related endeavors and in therapy. Second, the patient and consumer may have an increased sense of ownership of their own process in progressing through therapy and obtaining and sustaining gainful employment with these techniques. This type of self management also allows the clinician to enhance the therapeutic outcome by collecting data during sessions. Self monitoring extends beyond the therapeutic setting and may be effective in alternative settings such as multidisciplinary rehabilitation programs and pain management centers.

Self monitoring procedures can apply to a variety of different individuals according to gender, race, type of disability and vocational backgrounds as well. This procedure is relatively easy to teach and implement and is very likely to be acceptable to a variety of clinicians and rehabilitation professionals. General beneficial trends were shown using self monitoring which indicates the potential for generalization and
maintenance of treatment effects, as demonstrated by the final intervention phase in the
study. This is especially evident when looking at the data of Patient A.

These findings also support and extend the notions behind the cognitive-behavioral model. The model has emphasized the critical roles that pain-related
cognitive schemas, cognitive processes, and cognitive products play in maintaining and
at times exacerbating pain among chronic pain sufferers (Turk & Rudy, 1992).
Although the model has not speculated about the relative importance of different
cognitive levels in pain perception, it has postulated about the direct and indirect
mechanisms by which maladaptive thoughts can affect perceptions of pain.

The findings of this study were consistent with previous research that found the
negative side effects from narcotic use, most notably sedation, mental clouding, and
addiction, tend to interfere with the common goal of pain management coping strategies
and the ultimate goal of returning to work. Consistent with this view, treatment from the
biopsychosocial perspective focused on providing the patient with techniques to gain a
sense of control over the effects of pain on his or her life (Turk, 1996).

5.6 Delimitations/Assumptions
Information for this study was gathered through psychotherapy sessions in
which the BWC clients participated. The study included only those clients who have
been diagnosed as having chronic pain along with a secondary psychiatric condition.
Subjects included in this research were mid-career (ages 35-50) workers compensation
recipients. Generalizations should be limited to this group or similar groups.
Subjects were selected from a pool of BWC claimants given the parameters above. The subjects were all injured while at work. Generalization beyond workers compensation recipients with chronic pain and secondary psychiatric claims should be used with caution. Consideration was also given to the varied state-by-state workers compensation laws.

Participants were selected based on eligibility for chronic pain met according to prior pain evaluations given by treating physicians. The subjects chosen for this study were of interest due to the complex pain issues and their pervasive negativistic thinking styles which surround their chronic pain and workers compensation status.

It was assumed that the data collected in this study reflected the workers compensation recipients within the Columbus, Ohio BWC system who have chronic pain and psychiatric disability. Return to work potential was examined using self monitoring of negative statements made by these claimants. The claimant’s participation in this research reflected the influence of the self monitoring process upon return to work. Mechanisms by which these individuals choose to view their pain and its effect on their vocational success needs be studied further.

5.7 Limitations of the study

Due to the nature of conducting research in an applied setting, the utility of self monitoring procedures described in this study may be limited by several factors. Problems in conducting a study of this type in a clinical non-academic setting include recruiting and retaining participants. While it was not feasible for the investigator to recruit additional participants due to practical constraints, what mattered was the quality
of the self monitoring procedures. However, there are limitations to the sample. This study served claimants in the Workers Compensation system living in Columbus, Ohio. People in other parts of the country or with different cultural and social backgrounds with different compensation claims may have had different experiences.

Another general methodological issue in this study that may have affected the outcome involves the design itself. Although the ABAB reversal design is the most powerful design in single subject research, ABAB design does not lend as much to treatment effects as other designs. Additional phases beyond what was shown in this study would have enhanced the credibility of such treatment effects.

There were fairly few data points per phase although responding patterns were stable and the functional relationships for each participant were powerful. For example, Patient B demonstrated limitations with carryover effects to Baseline 2, where he possibly internalized the procedures. This in turn may have diminished the strength of the functional relationship.

Limited external validity was also a limitation in this study. This is due to the fact that there were only two intervention phases. It is through multiple replications of the intervention that external validity can be strengthened.

Lastly, no attempt was made to include equal numbers of male and female participants, especially since the number of subjects was limited to three. It is known that gender difference plays a role in the individual experience of pain (The Gallup Organization, 2000). Whether or not gender differences affect the efficacy of self
monitoring on pain and pain related variables is not clear and further studies may help determine whether or not there is indeed a relationship.

Another potential limitation concerns the differences in the location of pain and the severity of impairment among the participants. The fact that the participants were not a homogenous group may also be considered a weakness and may limit the generalizability of findings. However, the self management procedure used in the study was designed specifically for chronic pain patients. Clinical pain patients may not always be a homogenous group, therefore making it difficult to generalize results from the average to the individual patient. As mentioned previously, the majority of researchers have treated CPP’s as a homogeneous group with shared personality characteristics which need to be discovered, described, and eventually modified through treatment.

Chronic pain is a multifaceted problem and vocational rehabilitation is determined by an interaction among many factors, including the workers’ compensation system, the insurance carrier, regional attitudes and policies, the employer’s attitude toward the injured worker, pain program variables, clinical intervention and treatment protocols, private disability policies and other potential mediators outside the scope of this study.

5.8 Directions for future research

The following list provides possibilities for future research in the area of chronic pain, negativistic thinking and return to work particularly with the use of self management techniques:
More research needs to be conducted in Vocational Rehabilitation (VR) and in clinical settings regarding self management procedures. It is suggested that these findings be replicated in other areas within VR and counseling. Further replication is needed to assess consumer needs and provide ways in which they can see tangible opportunities to change their behavior which may lead to positive outcomes. The results of this study also need to be replicated and cross-validated for generalizability to other pain populations.

A replication of the present study with individuals of differing ages, disabilities, and clinical profiles would be beneficial to the literature. It is possible that the patients who participated in this study are not representative of other patients of similar age, disability, and clinical background. Further outcome research is also recommended at longer follow up periods to establish if patients who returned to work following completion of an applied behavioral intervention are still employed in 6 months, one year and five years.

As evidenced in the data, pain related statements are the most strong in terms of functional relationships. Future studies using this population should focus more on pain related statements to refine interventions.

An additional area of potential interest for this study would be to investigate the relationship between the role of one’s personality and its affect on attaining and maintaining employment despite pain issues. Specifically issues surrounding self monitoring and its connection to identity and vocational maturity should be explored. There has been recent renewed interest in the role that personality plays in job-related
performance, attitudes, satisfaction and behaviors (Walsh & Eggerth, 2005). In the arena of returning injured workers to gainful employment, these concepts should be considered. All of the subjects in this study had similar Axis I disorder features, and two had similar Axis II personality disorder traits which may offer an opportunity to explore how these correlate to job-related endeavors.

In looking at the characteristics of chronic pain patients, demographic characteristics have been more researched than personality characteristics. While the MMPI-2 has been used to identify and group individuals into certain code types, recent applications on how these characteristics affect the patients self concept and their role in vocational success have not been investigated.

Lastly, it is recommended to extend participants for future studies and look at additional components of self monitoring used with incompatible statements. For example, it may be beneficial to replace negative with positive statements through self monitoring and replacement of behavior. Further research investigating the efficacy of positive self-statements is warranted, considering they were not investigated in this particular study. Identifying the specific factors and contexts that make positive self statements effective may represent a vital contribution to the scientific literature and applied psychology. The use of positive statements as a substitute for negative ones may allow clinicians, researchers, rehabilitation professionals and the general public to maximize effectiveness of self monitoring.

The findings in this study have merely skimmed the surface of what treatment options are available for the injured workers return to work success. Considering the
impact of work-related injuries and disability on personal lives and society overall, the
need to identify and treat biopsychosocial factors that are predictive of return to work is
paramount in an era of limited health care resources. Identifying patients who may be at
risk for disability from work-related injury should begin at the level of primary
intervention. When a patient reaches the level of chronic pain intervention, the
likelihood of returning to work significantly decreases the longer a person is off work.
The likelihood of secondary psychiatric disability may also increase.

Results of this study support other researcher’s findings regarding the ability of
self monitoring to predict future behavior. In addition, the clinically significant
relationship found between the power of self efficacy, self regulation and self
monitoring of one’s negative statements demonstrates that the concept can be used to
develop more programs in a clinical setting. This study provides evidence that an
explicit and supportive self management intervention procedure can improve outcomes
for chronic pain patients with negativistic thinking patterns. Also, socially significant
implications may include the use of various professionals to implement this procedure
and that patients with chronic pain, depression or other disabilities can benefit from self
management interventions.

These implications may alleviate some of the logistical and financial burdens as
the outcomes-driven federal mandates increase demands on various social service
systems and vocational rehabilitation agencies to meet or exceed ambitious vocational
and therapeutic goals for all consumers.
Finally, it is clear from this study that when effective interventions are implemented for patients who present some of the greatest challenges both psychically and mentally, such as cognitive deficits and compromised functional capacity, their improvements can meet or exceed that of their non-risk peers, and the prognosis for future improvements in self efficacy and vocational success begins to brighten.
LIST OF REFERENCES


NAME: Sample Data Sheet

SESSION/TOPIC:

Pain Related Statement: Ongoing qualifier in direct relation to pain
- Nobody ever understands my pain
- I cannot do anything about my pain
- I’m not worth anything because of my pain

Other negative statements:
- I can’t get enough sleep
- I am mad at my spouse
- Everything is falling apart

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COMMENTS:
APPENDIX B

PERSONAL HEALTH INFORMATION IN RESEARCH
Title of the Study: Effectiveness of Self-Monitoring of Negative Self-Statements with Chronic Pain Patients

OSU Protocol Number: 2007B0103

Principal Investigator: Bruce Growick, Ph.D

Subject Name ________________________________________________________

Before researchers use or share any health information about you as part of this study, The Ohio State University is required to obtain your authorization. This helps explain to you how this information will be used or shared with others involved in the study.

- The Ohio State University and its hospitals, clinics, health-care providers and researchers are required to protect the privacy of your health information.
- You should have received a Notice of Privacy Practices when you received health care services here. If not, let us know and a copy will be given to you. Please carefully review this information. Ask if you have any questions or do not understand any parts of this notice.
- If you agree to take part in this study your health information will be used and shared with others involved in this study. Also, any new health information about you that comes from tests or other parts of this study will be shared with those involved in this study.
- Health information about you that will be used or shared with others involved in this study may include your research record and any health care records at the Ohio State University. For example, this may include your medical records, x-ray or laboratory results. Psychotherapy notes in your health records will be shared and used. Please read the information carefully before signing this form.
Please ask if you have any questions about this authorization, the University’s Notice of Privacy Practices or the study before signing this form.

Initials/Date: _______________

Those Who May Use, Share And Receive Your Information As Part Of This Study

- Researchers and staff at The Ohio State University will use share and receive your personal health information for this research study. Other Ohio State University staff not involved in the study but who may become involved in your care for study-related treatment will have access to your information.

- Those who oversee the study will have access to your information, including:
  - Members and staff of the Ohio State University’s Institutional Review Boards, including the Western Institutional Review Board
  - The Office for Responsible Research Practices
  - University data safety monitoring committees
  - The Ohio State University Research Foundation

- Your health information may also be shared with federal and state agencies that have oversight of the study or to whom access is required under the law. These may include:
  - The Food and Drug Administration
  - The Office for Human Research Protections
  - The National Institutes of Health
  - The Ohio Department of Human Services

These researchers, companies and/or organization(s) outside of The Ohio State University may also use, share and receive your health information in connection with this study:

- **none**

The information that is shared with those listed above may no longer be protected by federal privacy rules.

Initials/

Date________

Authorization Period
This authorization will not expire unless you change your mind and revoke it in writing. There is no set date at which your information will be destroyed or no longer used. This is because the information used and created during the study may be analyzed for many years, and it is not possible to know when this will be complete.

**Signing the Authorization**

- You have the right to refuse to sign this authorization. Your health care outside of the study, payment for your health care, and your health care benefits will not be affected if you choose not to sign this form. You will not be able to take part in this study and will not receive any study treatments if you do not sign this form.

- If you sign this authorization, you may change your mind at any time. Researchers may continue to use information collected up until the time that you formally changed your mind. If you change your mind, your authorization must be revoked in writing. To revoke your authorization, please write to:

  Bruce Growick, Ph.D 614-292-8183
  or Cheryl Littrell 614-621-3673

- Signing this authorization also means that you will not be able to see or copy your study-related information until the study is completed. This includes any portion of your medical records that describes study treatment.

**Contacts for Questions**

- If you have any questions relating to your privacy rights, please contact Cheryl Littrell 614-621-3673

- If you have any questions relating to the research, please contact Bruce Growick, Ph.D 614-292-8183.

**Signature**

I have read (or someone has read to me) this form and have been able to ask questions. All of my questions about this form have been answered to my satisfaction. By signing below, I permit Dr. Bruce Growick and the others listed on this form to use and share my personal health information for this study. I will be given a copy of this signed form.

Signature

(Subject or Legally Authorized Representative)

Name

(Print name above)

(If legal representative, also print relationship to subject.)

Date___________ Time _________ AM / PM
APPENDIX C

PATIENT INTERVENTION RATING PROFILE
# Patient Intervention Rating Profile

**Name:**

**Date of completion:**

**INSTRUCTIONS:** Please read each statement below. Then decide how much you agree or disagree with it. Put a checkmark in the box that shows how much you agree or disagree with the statement.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I felt as though I was adequately informed about this study and all it entailed</td>
<td>Strongly Agree Agree Neutral Disagree Strongly Disagree</td>
</tr>
<tr>
<td>2. I think self monitoring procedures made therapy more effective.</td>
<td>Strongly Agree Agree Neutral Disagree Strongly Disagree</td>
</tr>
<tr>
<td>3. I would like to continue participating in the self monitoring of negative self statements in future therapy sessions</td>
<td>Strongly Agree Agree Neutral Disagree Strongly Disagree</td>
</tr>
<tr>
<td>4. I feel the practice training session of self monitoring was useful.</td>
<td>Strongly Agree Agree Neutral Disagree Strongly Disagree</td>
</tr>
<tr>
<td>5. I feel that the quality of my self statements have improved</td>
<td>Strongly Agree Agree Neutral Disagree Strongly Disagree</td>
</tr>
<tr>
<td>6. I think the self monitoring procedure helped me make less negative statements</td>
<td>Strongly Agree Agree Neutral Disagree Strongly Disagree</td>
</tr>
<tr>
<td>7. I think the self monitoring procedures helped me make less negative statements about my pain</td>
<td>Strongly Agree Agree Neutral Disagree Strongly Disagree</td>
</tr>
<tr>
<td>8. I feel it is important to decrease the number of negative self statements I make</td>
<td>Strongly Agree Agree Neutral Disagree Strongly Disagree</td>
</tr>
<tr>
<td>9. I feel that the self monitoring intervention will help me return to work</td>
<td></td>
</tr>
<tr>
<td>10. I plan to use the self monitoring of negative self statements on my future job</td>
<td></td>
</tr>
<tr>
<td>11. Please feel free to share any additional comments you may have about the self monitoring process.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

CANDIDATES RESEARCH LETTER
May 29, 2007

Office of Responsible Research Practices
Attention: Ms. Kelli Cyrus, IRB Coordinator
The Ohio State University
300 Research Foundation Building
1960 Kenny Road
Columbus, Ohio 43210-1063

Dear Ms. Cyrus:

We are aware of the interest Lisabeth Babson has in conducting research at our practice, The Association for Psychotherapy. We are in full support of Ms. Babson’s intentions to study the relationships between chronic pain and negative self statements with our Bureau of Workers’ Compensation patients for her doctoral dissertation at the Ohio State University.

Please do not hesitate to contact us with any questions or concerns you may have regarding this potential study.

Sincerely,

J. Nick Marzella, Ph.D.
Psychologist
APPENDIX E

OSU RESEARCHER CONSENT FORM
The Ohio State University Consent to Participate in Research

Study Title: Effectiveness of Self-Monitoring of Negative Self-Statements with Chronic Pain Patients

Researcher: Lisabeth J. Babson, MA, CRC

This is a consent form for research participation. It contains important information about this study and what to expect if you decide to participate.

Your participation is voluntary.

Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate. If you decide to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose:

You are being asked to participate in this study that will look at the effects of a self-monitoring intervention on the frequency of negative self statements made by those who suffer from chronic pain.

Procedures/ Tasks:

In this study you will learn strategies on how to reduce the number of negative statements you make in each therapy session and in your everyday life. Sessions will be conducted twice a week, totaling 30 minutes per session. During our sessions I will be listening to statements you make and I will keep track of them. You will not notice a difference in treatment sessions. Additionally, sessions will be audio taped. The sole purpose is to examine negative self statements in sessions and to ensure accuracy. Access to these audio taped sessions will be used for analysis only and will not become part of your permanent file.

Duration:

You may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you, and you will not lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University or the Association for Psychotherapy, Inc.
**Risks and Benefits:**

Risks are minimal in this study. The benefits of this study will be the increase in positive self statements and a decrease in negative self statements. These benefits have the immediate potential for less negative statements made and may be long term and generalized to other settings. Overall, your sense of self esteem will hopefully improve along with chances for vocational success.

**Incentives:**

Not applicable in this study

**Confidentiality:**

Efforts will be made to keep your study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your participation in this study may be disclosed if required by state law. Also, your records may be reviewed by the following groups (as applicable to the research):

- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

The confidentiality of any personal records will remain protected throughout the study and any results of the self monitoring process will be disposed of at the conclusion of the research.

**Participant Rights:**

You may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you are a student or employee at Ohio State, your decision will not affect your grades or employment status.

If you choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights you may have as a participant in this study.
An Institutional Review Board responsible for human subject’s research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Contacts and Questions:
For questions, concerns, or complaints about the study you may contact:
Bruce Growick, Ph.D Principal Investigator 614-292-8163

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

If you are injured as a result of participating in this study or for questions about a study-related injury, you may contact J. Nick Marzella, Ph.D 614-621-3673.

Signing the consent form

I have read (or someone has read to me) this form and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

<table>
<thead>
<tr>
<th>Printed name of subject</th>
<th>Signature of subject</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM/PM</td>
</tr>
<tr>
<td>Date and time</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Printed name of person authorized to consent for subject (when applicable)</th>
<th>Signature of person authorized to consent for subject (when applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM/PM</td>
</tr>
<tr>
<td></td>
<td>Date and time</td>
</tr>
</tbody>
</table>
Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining consent
Lisabeth J. Babson, MA, CRC

Signature of person obtaining consent

AM/
PM

Date and time
APPENDIX F

SCRIPT FOR OBTAINING PATIENT VERBAL CONSENT
Association for Psychotherapy, Inc

Script for Obtaining Patient Verbal Assent

You are being asked to participate in a research study. I am interested in learning about the role negative statements have on your well being and your pain levels. I am going to tell you a little bit about the study and then ask you if you would like to participate. You should ask any questions you may have before making up your mind. You can think about it before you decide.

I will be tracking your use of negative statements in our sessions. These sessions will be audio taped so that I can listen to the tapes at a later date. My supervisor will also have access to these tapes as part of the study.

If you do not wish to participate in this study it will no way affect your treatment with the Association for Psychotherapy or your claim with the Bureau of Workers Compensation. All information collected in this study will be kept strictly confidential. The Association for Psychotherapy addresses the role of medical information for research purposes in our Notice of Privacy Practices form. The research specific in this study will be accessed by personnel at the Ohio State University. Please be assured that your private medical information will be protected.

The goal of this study is to examine the effects negative statements have on chronic pain. If you decide to participate in this study I will be conducting two 30 minute sessions each week. Would you like to participate in this study?