PREDICTORS OF SUCCESS ACROSS DIFFERING INTERDISCIPLINARY PAIN

PROGRAMS: WHO BENEFITS FROM WHICH TREATMENT?

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by

SARAH RENEE OSLUND

DISSERTATION

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PREDICTORS OF SUCCESS ACROSS DIFFERING INTERDISCIPLINARY PAIN

PROGRAMS: WHO BENEFITS FROM WHICH TREATMENT?

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This study aimed to examine predictors of completion and success in interdisciplinary treatment for chronic pain and to provide clinicians with relevant information in determining the appropriate treatment intensity for patients. A total of 1,062 patients were examined who participated in one of three different levels of treatment intensity: a 120 hour treatment program (n=699), a 72 hour treatment program (n=61), and a 24 hour treatment program (n=302). Results indicated that higher levels of anxiety and greater number of visits to the emergency room in the twelve months prior to treatment were predictive of premature termination of treatment in the more intensive

program. For less intensive programs, number of hours resting per day was predictive of early termination of treatment. Predictors of success were then examined utilizing five definitions of success.   No single measure was found to be a significant predictor across all five domains. However, lower levels of health care utilization, higher levels of affective distress, greater perceived interference from pain, and lower levels of perceived control were predictive of successful outcomes. Overall, the findings indicate that individuals with greater dysfunction at treatment entry will benefit more from treatment. When comparing three programs of different intensities, the most intensive program produced a higher proportion of successful outcomes. Pre-treatment variables were explored as a means of identifying relevant clinical variables that could be utilized by clinicians to identify the most appropriate treatment program for patients. Greater number of hours resting and higher levels of pain at pre-treatment were found to be useful variables. Namely, those resting more than seven hours per day or reporting pain levels higher than six out of twelve indicated a need for the most intensive program.

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BAI – Beck Anxiety Inventory

BDI-II – Beck Depression Inventory

CI – Confidence Interval

COP – Comprehensive Outpatient Program

FIT – Focused Interdisciplinary Treatment

IMMPACT – Initiative on Methods, Measurement, and Pain Assessment in Clinical

Trials

MCOP – Modified Comprehensive Outpatient Program

MPI – Multidimensional Pain Inventory

CHAPTER ONE
Introduction

Over 2.9 million Americans are currently living with chronic pain (Marketdata Enterprises, 1995), and an estimated 22% of patients seen in primary care settings report persistent pain (Gureje, VonKorff, Simon, & Gater, 1998). Pain has become an epidemic in our society, impacting individuals from all walks of life.

Chronic pain is not simply a physical condition, but a perceptual experience influenced by biological and psychosocial factors that often leads to physical and emotional suffering. Chronic pain impacts daily functioning and a person's ability to work, leading to financial strain on individuals and their families. In addition to the patients and those around them, chronic pain is costly to society as a whole, in terms of lost wages, disability payments, and lost productivity. It is estimated that the total yearly cost of treatment ranges from $100 billion (National Institute of Health, 1998) to $150 billion (U.S. Bureau of the Census, 1996).

There are several treatment options available to chronic pain patients, including pharmacological and surgical interventions. Unfortunately, the efficacy of these interventions is limited. Chronic pain sufferers often seek treatment from interdisciplinary programs following failure to find relief from other treatment options (Clark, 2000).

Initially, chronic pain was understood as solely a biomedical phenomenon in which pain was a direct result of physiological damage. However, the understanding of pain has evolved with 40 years of sound research, and investigators have repeatedly demonstrated that psychosocial factors play a central role in the exacerbation and

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maintenance of pain. The longer pain is present, the more important psychosocial factors become. Changes occur in the central nervous system and the brain in response to pain and psychosocial factors associated with pain. In fact, in disorders such as phantom limb pain, the pain experience is no longer dependent on the pain stimuli. This biopsychosocial conceptualization of pain has led to the development of interdisciplinary treatments for chronic pain that address the biological, psychological, and social factors that contribute to and exacerbate chronic pain problems.

Interdisciplinary treatment programs have been found to be effective for a large number of patients. Despite the proven effectiveness of interdisciplinary treatment programs for intractable pain, not all patients benefit from interdisciplinary care. Furthermore, not all individuals with chronic pain need intensive outpatient programs. The complicated presentation of many of the patients being seen in interdisciplinary treatment programs necessitates increasing our understanding of factors related to treatment success and optimal intensity.

The current study aimed to build upon the current knowledge of interdisciplinary treatment programs by identifying predictors of completion and success as well as identifying optimal treatment intensity for different types of patients.

CHAPTER TWO
Review of the Literature

SCOPE OF THE PROBLEM

In the United States, a substantial number of individuals are afflicted with chronic pain (Turk, 2002). Estimates of the prevalence of chronic pain are varied and range from 2% to 40% of the population, with a point prevalence of 15% (Verhaak, Kerssens, Dekker, Sorbi, & Bensing, 1998). A national survey of pain specialists estimated that 2.9 million Americans (or 1.1%) are being treated annually in chronic pain settings (Marketdata Enterprises, 1995). However, this underestimates the prevalence of chronic pain, as many individuals seek treatment from sources other than pain specialists. For instance, 22% of patients seen in primary care settings report the occurrence of persistent pain (Gureje, VonKorff, Simon, & Gater, 1998).

Chronic pain is costly, not only to the individual sufferer, but also to society as a whole. At the individual level, chronic pain negatively impacts a person's psychological and physical well-being. At a societal level, chronic pain costs billions of dollars in lost wages, lost tax revenue, health care expenses, and disability payments (Turk, 2001). When all costs of treatment of chronic pain are combined, it is estimated that the total yearly cost of treatment ranges from $100 billion (National Institute of Health, 1998) to $150 billion (U.S. Bureau of the Census, 1996).

It is well established that interdisciplinary treatment programs are clinically and cost effective. According to one meta-analysis examining interdisciplinary pain management programs (Flor, Fydrich, & Turk, 1992), the mean pain reduction for patients equaled 37%, and a 63% decrease in prescription pain medication usage was

found. In addition, interdisciplinary patients showed better overall functioning than 75% of those patients who engaged in other treatment modalities.

Despite the effectiveness of interdisciplinary treatment programs for intractable pain, continued emphasis on improving outcomes and tailoring treatment to the unique needs of each individual is required. With increasing pressure from third party payers to manage the cost of patient care, identifying relevant patient variables that assist in determining the appropriate level of treatment intensity is needed. Furthermore, the National Institutes of Health (NIH) produced a Technology Assessment Conference Statement (1996) highlighting the importance of tailoring treatment to meet the needs of chronic pain patients. Unfortunately, it is not well understood who benefits most from these types of programs, the optimal level of intensity needed, and the factors related to treatment completion and success.

The current study aimed to identify variables related to treatment completion, success, and optimal level of treatment intensity. Comparisons were made between those who completed and those who failed to complete interdisciplinary programs. Of those who completed the program, individuals who gained significant benefits from the program were compared to those who did not. Finally, treatment success was compared across different treatment intensities. Before a discussion of these results, it is important to examine the evolution of our understanding of chronic pain, the development of the interdisciplinary approach, and the specific components of this approach.

THEORIES OF PAIN

Pain is influenced by sociocultural beliefs about its etiology and biology. Over the course of history, the understanding of pain has evolved from one in which pain was considered the work of demons to an understanding that the pain experience involves an interplay between biological, psychological, and social factors. During this evolution of understanding, the mind and body distinction has taken shape, lost favor among popular opinion, and re-emerged in a greatly modified form.

Historical Understanding of Pain

Our understanding of the interaction between the mind and body has been a long evolutionary process. Hippocrates, an ancient Greek physician, proposed a theory in which the mind and body were intimately connected. He proposed that there were four bodily fluids called humors that correlate with specific personality attributes. Excesses or imbalance in these four humors led to certain emotional and physical symptoms. Yellow bile was associated with choleric (angry) temperament, black bile with melancholia, blood with optimism and phlegm with listlessness. Hippocrates' theory is important, as it highlights the lack of distinction between mind and body as well as between physical and emotional symptoms, which is a relatively new conceptualization within human history (Gatchel, Baum, & Krantz, 1989).

During the Renaissance period, an explicit shift occurred separating the mind and the body. The French philosopher, Rene Descartes, is most often credited with this dualistic view. The soul was considered the domain of the church, and questioning superstitious beliefs about health, such as illness resulting from sinful behavior, could

lead one to be accused of heresy. Descartes' separation of mind from body allowed Western science to view the body as an empty vessel and the mind and soul as an aspect of humans for the church to understand. This allowed for a switch from the earlier model of disease resulting from being possessed by demons to a view that did not cause a conflict between science and religion. From this compromise, this separation of mind from body, the scientific method and the biomedical model flourished (Gatchel et al., 1989).

The biomedical model focuses exclusively on the physical processes of the body and diseases. External factors, such as social variables, are ignored and considered irrelevant. According to this biomedical model, pain solely involves nocioception, which is the stimulation of nerves that results in a message about the tissue damage being sent to the brain. Based on this model, pain is the direct result of physical damage, and the amount of pain should correspond with the degree of damage. This simple reaction did not take into account differential individual reactions to pain and regarded pain as an "alarm system." This strictly physiological viewpoint was further supported in the nineteenth century by the discovery that microorganisms cause disease. Conditions that were deemed to be caused by psychological variables were viewed as a separation from physiological causes, and thus not treated by physicians (Gatchel, et al., 1989).

Current Physiological Understanding of Pain

Today, the physiological nature of pain continues to be recognized and appreciated. However, most clinicians frame it within a broader context of the "whole" person, meaning psychological and social factors interact with physiology. Our

understanding of the exact physiological nature of pain has grown from the earlier biomedical models and aids in our understanding of pain. Fields (1987) provided an overview of the physiological nature of pain in a text that is considered a classic within the pain literature. From a physiological standpoint, pain begins with either an injury or potential injury. There are four processes involved in the physiological experience of pain from the injury: transduction, transmission, modulation, and perception. During transduction, chemicals released in response to a noxious stimuli are translated into electrical signals at the sensory nerve endings. Once transduction has taken place, the transmission process begins. The sensations that result from transmission are determined by neurons in the pain transmission system.

The pain transmission system consists of three components. The peripheral sensory nerves send signals from the site where transduction occurred to the appropriate terminals in the spinal cord. An amino acid polypeptide, called substance P, is released from unmyelinated primary afferent fibers when activated. Substance P causes vasodilation and produces swelling. In addition, substance P causes histamine to be released from mast cells, which in turn activates nociceptors. Histamine also produces vasodilation and swelling. From the spinal cord, a network of relay neurons ascend to the brainstem and thalamus. Reciprocal connections send signals from the thalamus to the cortex. Modulation involves neural activity in the central nervous system at the spinal cord. Pain transmission cells can be either inhibited by such things as analgesic medications or activated by stress. The final piece of this process is perception, in which the subjective experience of pain occurs. Perception is influenced by the neural activity

of the pain transmission neurons (Fields, 1987). This physiological understanding of pain acknowledges that psychological variables (i.e. stress) can modulate the pain experience.

Integration of Psychosocial Factors into the Biomedical Model

The incorporation of psychological variables into the modern conceptualization of pain began during the mid-nineteenth century. At this time, the strictly dualistic viewpoint of the mind and body began to fade slightly, primarily through the work of Claude Bernard. He was one of the first physicians to highlight the contributions of psychological factors to physical illness. Sigmund Freud further stressed the interplay between psychological and physiological factors in producing and maintaining various disorders (Gatchel et al., 1989).

During World War II, Henry K. Beecher, a physician working with injured soldiers, observed that many of the severely injured men he was treating reported little to no pain and refused pain medications. He noted that approximately one-fourth of the injured soldiers experienced pain as expected. This led him to hypothesize that for the remaining three-fourths of the soldiers who experienced little to no pain, the injuries they sustained in battle meant safety for them. These injuries caused them to enter a hospital for treatment, removing them from an environment fraught with danger, anxiety, and fatigue. By entering the hospital, they believed that the danger they had experienced in battle was over, and thus they entered a state of relief. This psychological mindset resulted in a dampened sense of pain (Beecher, 1946).

Although our understanding of the importance of psychosocial factors grew during the early 20th century, it was Melzack and Wall (1965) who proposed one of the

first comprehensive theories of pain that allowed for the integration of psychological and

physical factors into our understanding of chronic pain. Their theory, the gate control

theory (GCT), provided a physiological basis for which psychological factors affect the

pain experience. Their model included the two types of afferent pain-receptive nerves

that send signals to the brain. The Aδ fibers are thick, myelinated nerve fibers that send

messages about intense pain to the brain quickly. The C fibers are unmyelinated and

send long-term and dull pain signals to the brain in a slower fashion. In addition, there

are non-nocioceptive (non pain transmitting) fibers called Aβ fibers that can inhibit the

effects of the firing of the Aδ fibers and C fibers. The Aδ fibers and C fibers send pain

signals to the laminae in the dorsal horn of the spinal cord. This area also receives input

from the Aβ fibers, which indirectly inhibit the signals from the pain fibers via an

interneuron, effectively "closing the gate" on the pain signal transmission. Descending

fibers from the brainstem to the spinal cord can also serve an inhibitory or excitatory

function. Ascending fibers to the brain interact and influence the descending fibers, thus

creating a loop system.

Although the specifics of the GCT of pain have been greatly modified, the role

of psychosocial factors in the exacerbation and maintenance of pain has been clearly

established (Turk & Rudy, 1987). Melzack (1999) modified and expanded the GCT to

incorporate Selye's (1950) theory of stress and to address perceptual phenomenon such as

phantom limb pain. This new theory of pain, the Neuromatrix Theory of Pain, proposed

that the body has a widely distributed neural network, called the body-self neuromatrix,

which integrates cognitive-evaluative, sensory-discriminative, and motivational-affective

components. Neural networks are comprised of interconnected neurons in the brain

which process information simultaneously. This body-self neuromatrix is a genetically determined system that is modified by sensory inputs. Sensory inputs are dependent on the experience and situation. With each new event, the entire neuromatrix is modified. Once a noxious signal is received, the neuromatrix is hypothesized to produce a perceptual, homeostatic, and behavioral program based on its neural network. Factors such as hormones and stress affect the neuromatrix and modify not only its ability to achieve homeostasis, but also the point of homeostasis. For example, the neuromatrix theory of pain allows for the role of hormones such as cortisol to impact the perception and maintenance of pain.

When pain occurs, the stress system is activated and cortisol is released. Cortisol serves as a signal for the body to conserve energy in areas that are not necessary for immediate survival so that energy can be expended in ways that are vital to survival.   Its output impacts the hippocampus and sympathetic nervous system. With prolonged activation, a dysregulation in cortisol occurs and the system begins to breakdown. Immune system functioning is impacted, and the ability to heal is decreased. Cortisol dysregulation may play a crucial role in the development of chronic pain, as the body is unable to heal properly. The neuromatrix theory of pain points out the important role of prior experience and the changes that occur to a genetically predetermined system. This theory helps to explain why someone would experience pain with little or no tissue damage, for instance, in the case of phantom pain.

Today, the overarching model of pain is the biopsychosocial model, which allows for the incorporation of previous models, such as the GCT. First theorized by George Engel (1977), the biopsychosocial model rejected the reductionistic, biomedical

model of disease, which focused almost exclusively on the physiological processes of disease. Engel, however, made the distinction between disease and illness. Disease refers to the pathophysiological processes and is the focus of the biomedical model. Illness encompasses not only the pathophysiological aspects, but also the psychological, social, and cultural impacts. The biopsychosocial model posited that in order to fully understand a disease, the biological, psychological, and social aspects must be considered. These three components interact directly and indirectly.

Applied to chronic pain, this model encapsulates the Gate Control Theory, the Neuromatrix Theory, and our physiological understanding of pain. Thus individuals' genetic makeup, along with their prior experiences, current mood, expectations, appraisals, and sociocultural variables interact with nocioception to produce their perception of pain (Turk & Monarch, 2002). For example, an individual who is depressed, has limited belief in his ability to overcome stressors, and with little social support will likely experience more pain following a stress fracture than an individual with a strong support network who recovered quickly from a similar injury in the past. This model helps to elucidate the interaction among biological, psychological, and social variables in the production and modulation of pain that is unique to each individual.

Over the past 20 years, the physiological nature of pain described by Fields and others has been expanded upon. With the advent of new technology, such as functional-magnetic resonance imaging (fMRI), our understanding of how physiological and psychological factors interact has become more sophisticated. This newly acquired knowledge provides support for the underlying constructs of the GCT and Neuromatrix

theory of pain and further refines our understanding of the biochemical processes behind these constructs.

Once pain signals arrive at the central nervous system via the dorsal horn, several tracts carry signals to the brain. The spinothalamic tract neurons project from the spinal cord to the thalamus. From the thalamus, neurons project to the primary and secondary somatosensory cortex. The majority of the projections from the thalamus go to the primary somatosensory cortex, which is the main receptive area for touch and pain. Cells from the primary somatosensory cortex project to the secondary somatosensory cortex. While the exact role of the secondary somatosensory cortex is unclear, some fMRI evidence suggests that the primary and secondary somatosensory cortex are involved in the sensory-discriminative aspects of pain, such as pain intensity and location (Gatchel, Robinson, Peng, Benitez, & Noe, 2008).

Ascending nerve fibers to the thalamus, hypothalamus, and limbic system are responsible for the affective-motivational aspect of pain. Projections from the limbic system to the prefrontal cortex are involved in emotion, memory, and attention. Regulation of the autonomic nervous system, reward anticipation, decision making and emotion are all functions of the anterior cingulate cortex. The insula cortex is involved in memory and emotion and believed to be involved in the sensory-discriminative and the affective-motivational aspects of pain (Gatchel et al., 2008).

Greater activation of the primary and secondary somatosensory cortex, the anterior cingulate cortex, and the insula cortex corresponds to more intense pain. It is hypothesized that these areas create a brain network that processes pain. Thus, pain does not involve isolated areas of the brain (Gatchel et al., 2008). Our current understanding

of the physiology of brain pathways allows for a framework by which psychological variables play a role in the pain experience. Further, it supports the integrative models and provides a more comprehensive assessment of the brain activity and regions involved.

Transition From Acute to Chronic Pain

Based on the theories of pain, it appears that psychosocial factors become increasingly important the longer the pain condition exists. More specifically, as the pain experience becomes drawn out, one can hypothesize that the brain has more time to "re-wire" itself so that pain is experienced, whether or not the pain stimuli is still present. Thus, pain becomes "chronic" when the pain experience extends beyond what is "expected" to be a normal amount of time.

In an attempt to elucidate the progression from acute to chronic pain, Gatchel (1996) presented a three stage model to explain the transition and the role of psychosocial factors. His model begins with an injury that results in initial pain. He proposed that, during stage one, individuals react to pain with emotions such as fear, anxiety, and worry. If the pain persists past a reasonable amount of time (two to four months), individuals progress into the second stage of pain. During this stage, psychological and behavioral reactions and problems develop or are exacerbated. The exact manifestation and extent of these difficulties depend primarily on the individual's premorbid personality and psychological characteristics as well as his or her environmental condition, such as socioeconomic status. For example, individuals who have had difficulty with impulse control throughout their life may begin to act out more frequently. Chronic pain is taxing

to coping resources. Thus prior difficulties, which may have been previously well managed, are magnified. The third stage involves an acceptance of the "sick role" and pain behaviors are consolidated into the individual's life. This model of the progression from acute to chronic pain incorporates the biopsychosocial model and emphasizes that each individual's progression through the stages relies heavily on each of the pieces of the biopsychosocial model.

In an attempt to identify specific factors related to the developing chronic pain, Gatchel, Polatin, and Kinney (1995) conducted a study examining a variety of factors in a large sample of acute pain patients. They prospectively examined individuals with an acute pain problem who subsequently developed a chronic pain disability. They found that self-reported pain and disability and Axis II personality disorders were the most consistent predictors of disability status. Race, age, and Scale 3 on the MMPI contributed to discriminating between disabled and non-disabled individuals as well. These findings suggest that an interplay of multiple factors contributes to the development of chronic disability.

Once chronic pain has developed, it is difficult to treat and many factors are related to its maintenance. Many theories have been proposed to enhance our understanding of treatment resistance and are congruent with Gatchel's stages of pain development. These models can be thought of as falling under the overarching umbrella of the biopsychosocial model, as they emphasize different elements of the model.

Psychosocial Theories of Pain Maintenance

As mentioned previously, psychosocial factors play an important role in maintaining and exacerbating pain. A review of the most relevant theories and concepts in chronic pain research is discussed below. These theories have been helpful in formulating this proposal and will guide the interpretation of the results.

The fear avoidance model of pain proposes that there are two different pathways resulting from an individual's interpretation of acute pain. When acute pain is perceived as innocuous, the individual will likely continue normal activities. This promotes functional recovery and the individual will likely have no long-term effects (i.e. chronic pain). If the pain is interpreted as threatening, pain-related fears arise and the individual will engage in safety behaviors. These behaviors often involve avoidance and hypervigilance. Although these behaviors are often helpful during the acute phase of pain and may promote initial recovery, they are often counterproductive with chronic pain. They lead to disability and disuse, which lowers thresholds to further pain (Vlaeyen & Linton, 2000). Thus, when an individual does engage in activity, they actually produce further pain, which leads to further disability and inactivity.

Research has supported the fear avoidance model, in that fear of pain was found to account for a large degree of the difference between chronic pain patients and health controls in walking speed. Specifically, chronic pain patients anticipated more pain as a consequence of walking, and thus walked slower than healthy controls (Al-Obaida, Al-Zoabi, Al-Shuwaie, Al-Zaabie, & Nelson, 2003).

Once chronic pain is established and maintained, it is difficult for individuals to engage in the changes necessary to reduce their level of pain. Readiness to change has

been hypothesized to be a key factor in the decision to change. DiClemente and Prochaska's (1982) transtheoretical stages of change model, in conjunction with the biopsychosocial model, can be used to conceptualize the stages individuals go through when changing from maladaptive to adaptive behaviors. The stages of change model postulates that there are five different stages of change: precontemplation, contemplation, preparation, action, and maintenance. During each of these stages there is a potential for relapse. Chronic pain patients can fall into any of these categories, depending on their psychological readiness to make changes in their pain experience. Not only does individual appraisal and cognition affect which stage they are in, but social influences and psychological distress play a role as well. These variables can either inhibit or enhance an individual's readiness for change. An individual's place on this continuum can have a direct impact on treatment effectiveness. Conversely, treatment aimed at decreasing the impact of these variables can assist in moving the individual further along on the stages of change continuum.

Research focused on the stages of change have found that that this conceptual framework is useful in identifying predictors of treatment gains. Specifically, increases in readiness to change over the course of treatment has been found to be associated with improvement (Jensen, Nielson, Turner, Romano, & Hill, 2004). Further support of this model is provided by the finding that pretreatment contemplation of change, in addition to work status, accounted for 49% of the variance in functional outcomes at three months after treatment (Hankin & Killian, 2004).

Self-efficacy can have a major impact on readiness to change and as well as investment in treatment. Individuals with high self-efficacy believe in their ability to

perform, cope with difficulties, and achieve goals. Self-efficacy is impacted by motivation, cognitions, and external factors, such as social modeling and social support. Those with high self-efficacy are likely to do better in chronic pain treatment programs due to their belief in their ability to change. Treatment programs focusing on increasing motivation and decreasing the impact of harmful cognitive and social factors can also serve to enhance an individual's sense of self-efficacy. Thus, not only can self-efficacy serve as a factor impacting treatment, but treatment can enhance an individual's level of self-efficacy (Bandura, 1994).

Research into the role of self-efficacy in chronic pain has supported the use of this model. One study found that higher levels of self-efficacy in chronic pain patients was associated with high levels of activity, greater number of hours working, lower levels of psychological distress, less pain severity, and less pain behaviors (Levin, Lofland, Cassisi, Poreh, & Blonksy, 1996).

Related to self-efficacy and the fear-avoidance model is the concept of pain beliefs. Individual pain beliefs may help to further explain individual differences in the pain experience. Pain beliefs can lead to adaptive or maladaptive coping, exacerbation or maintenance of pain, differential suffering, and possibly disability. Cognitions about the consequences of pain, as well as one's ability to manage the pain can directly impact one's behavioral reactions (i.e. coping strategies, activity level), as well as one's mood (Turk, 1996). Research examining the cognitive distortion of catastrophizing lends support to the notion of pain beliefs and their influence on chronic pain. Sullivan, Lynch, and Clark (2005) found in their research study that pain catastrophizing, especially helplessness, was associated with greater pain intensity and greater ratings of disability.

Pain catastrophizing is a method of thinking in which negative aspects of pain and the potential negative consequences of pain are exaggerated and often of primary focus. Individuals who engage in this type of thinking have difficulty acknowledging less negative and catastrophic ways of thinking.

These theories and models vary in their explanation of why individuals develop pain and maintain their pain condition. These theories are often called upon in research to assist in understanding results. Although they are different in their focus, they can all be seen as more elaborate explanations of the biopsychosocial model of pain in each of their respective areas. Each relates back to the notion that pain is best understood as a perceptual experience influenced by biological, psychological and social factors. Although biological factors are likely the most important in initiation of pain, psychological and social factors play an increasingly central role in the maintenance and exacerbation of pain over time. From this biopsychosocial model, a treatment model was developed which aimed to address all of the factors related to pain. Today, this treatment model is commonly known as the interdisciplinary treatment model.

Summarizing the Theories of Pain

Our understanding of chronic pain has evolved and changed over the course of history. Once thought of as a consequence of demon possession and then purely physiological damage, what we now conceptualize pain as a construct which is influenced by physiological, psychological, social, and cultural factors. As pain moves from acute to a more chronic phenomenon, psychosocial factors become increasingly important in its maintenance.

INTERDISCIPLINARY TREATMENT PROGRAMS

In order to understand interdisciplinary treatment centers, it is first important to describe the differences between single disciplinary, multidisciplinary, and interdisciplinary programs. *Single disciplinary* treatment provides one specific intervention, such as physical therapy or nerve blocks. Comprehensive assessment and treatment of the overall pain condition is absent in this setting. A *multidisciplinary* approach involves several clinicians from different disciplines, such as a physician, psychologist, physical therapist, and occupational therapist. In a *multidisciplinary* approach, health care providers are not always in the same facility, thus communication and integration of care may be limited. An *Interdisciplinary* treatment approach is similar to a multidisciplinary approach, but health care providers deliver services within the same facility. Treatment is coordinated and frequent communication occurs. Thus, interdisciplinary treatment centers are much more interactive (Gardea & Gatchel, 1999).

The interdisciplinary treatment model involves individuals from multiple disciplines working together to address the plethora of issues related to chronic pain. This type of treatment intervention aims to address the specific components of the pain condition, such as the individual's level of pain, distress, interpersonal dysfunction, functional disability, and psychopathology. In addition, interdisciplinary programs attempt to transfer the responsibility of improvement and change from the treating clinician to the individual patient (Turk & Burwinkle, 2005).

The Commission on Accreditation of Rehabilitation Facilities (CARF; 2008) is a private nonprofit organization whose mission is to promote excellence in care in rehabilitation centers. CARF defines interdisciplinary pain rehabilitation programs as

centers that provide "outcomes-focused, coordinate, goal-oriented interdisciplinary team services" (pp. 233). Improving functioning and promoting appropriate utilization of health care services are key elements of these programs.

In 1996, the National Institutes of Health (NIH), along with other health care organizations, convened a technology assessment conference to identify and examine key treatment modalities for chronic pain. The committee asserted that pharmacological and surgical interventions continued to predominant the pain management field, despite the recognized contribution of psychosocial and behavioral factors into the chronic pain condition. Thus, the committee undertook the task of conducting a meta-analysis to examine the utility of behavioral and relaxation techniques with the ultimate goal of increasing clinical effectiveness. The results of this analysis provided strong evidence for the use of relaxation and hypnosis, and moderate support for CBT and biofeedback. Additionally, they found that multimodal treatment had a positive effect on chronic pain conditions. Based on their review, the committee concluded that there was insufficient data to identify one treatment modality as superior to the others. However, they did assert that each individual chronic pain patient is different, and thus, treatment should be tailored to the individual's need (NIH, 1996).

The British Pain Society (BPS; 2007) produced a set of recommended guidelines for interdisciplinary programs in an attempt to standardize such programs. The consensus statement of the BPS stated that a pain management program aims to improve all aspects of an individual's quality of life, including the physical, psychological and social dimensions. These aims are accomplished through the use of an interdisciplinary

approach. The chronic pain condition is conceptualized using a holistic approach, rather than focusing solely on the biomedical model of "disease."

The BPS stated that interdisciplinary treatment programs should be presented in a group format in order to normalize pain, allow for learning to occur from other group members, and decrease the cost of delivery. Primary components of interdisciplinary treatment programs identified included: education; goal setting; evaluation and modification of beliefs, cognitions, and behaviors; physical therapy; and relaxation. Emphasis was placed on tailoring these components of treatment to fit each individual's needs and focus on their specific dysfunction and disability (BPS, 2007).

Each of these professional organizations presented similar guidelines for treatment of chronic pain. Each stressed the importance of utilizing multiple modalities which work together to target the many facets of the pain condition. In addition, the patient is an active participant in treatment. Most importantly, an emphasis was placed on tailoring treatment to address the needs of the individual.

In summary, interdisciplinary treatment programs are comprised of a wide range of treatment providers working together to provide patient care. Treatment is focused not only on the physiological nature of chronic pain, but also the psychological and sociocultural factors that serve to maintain the condition. Multiple modalities of treatment are present in these types of programs and an attempt is being made for treatment to be tailored to each individual patient's unique set of difficulties.

GOALS OF AN INTERDISCIPLINARY TREATMENT PROGRAM

There are many goals of an interdisciplinary treatment program, as can be expected given the wide breadth of domains that are the focus of treatment. In the psychological realm, reducing distress and the impact of pain on the patient's mental well-being is key. Kinney and colleagues (1993) found a much higher prevalence of Axis I and Axis II disorders in chronic low back pain patients than in acute low back pain patients and the general population. Specifically, higher rates of major depression, substance abuse, and personality disorders were found. The authors asserted that treating the comorbid psychopathology is crucial when treating chronic pain patients. In addition, modifying beliefs and cognitions to a more realistic level through identifying and modifying catastrophic thinking and fears, and increasing self-efficacy are of utmost importance. Goals in the physical realm include improving objective and self-reported activity and physical ability. Finally, interdisciplinary programs attempt to reduce the pain experience and health care utilization (i.e. office visits, medication usage), as well as dysfunction and disability (i.e. through return to work) immediately and in the long-term (BPS, 2007).

EFFECTIVENESS OF INTERDISCIPLINARY TREATMENT PROGRAMS

Studies of the effectiveness of pain programs have been divided into four headings for the purpose of this proposal: a) meta-analyses of effectiveness of interdisciplinary pain programs; b) studies involving a single, specific outcome; c) long-term effectiveness; and d) studies involving multiple measures of effectiveness.

Meta-Analyses of Effectiveness

A large number of studies have been conducted analyzing the effectiveness of interdisciplinary treatment programs. One meta-analytic review reported an effect size of 0.62 between groups at short-term follow-up (mean= 5 weeks post-treatment) and 0.81 at long-term follow-up (mean = 95 weeks post-treatment). This correlates to those treated in an interdisciplinary setting functioning 30% and 38% better than controls at short-term and long-term follow-up, respectively. Quantification of functioning varied among the different studies analyzed, but included at least one of the following domains: somatic, psychophysiological, behavioral, pain, interference, mood, or other subjective measures. With-in group effect size for treatment groups was reported as 1.51 in the short term and 1.31 in the long-term. Put another way, this translates to a 60% improvement in the short-term and 55% improvement in the long-term. Improvement was measured in a variety of ways, depending on the study, and included such things as decreased health care utilization and return to work (Flor, Fydrich, Turk, 1992). Individual studies vary in their definition of what variables are most important in the analysis of effectiveness of interdisciplinary treatment programs. Thus, there is a wide array of "effectiveness" data available that investigates many domains.

Specific Outcomes of Effectiveness

The outcomes from several studies that focus on one specific outcome are described below and include: a) pain improvement; b) medication usage; c) physical functioning; d) return to work; e) coping and control; f) quality of life; h) emotional distress; and i) patient ratings.

Specific Outcomes of Effectiveness –Pain Improvement

One of the most intuitive areas by which to measure effectiveness is reduction in pain. Intensive interdisciplinary treatment programs have been found to be highly effective in restoring functioning and decreasing pain in chronic pain patients when compared to non-interdisciplinary programs (Guzmán et al., 2002). Flor and colleagues (1992) calculated that the mean pain reduction for patients treated in a pain management program was 37%. Many others have reported reductions in pain following treatment (e.g. Hubbard, Tracy, Morgan, & McKinney, 1996; Becker, Sjøgren, Bech, Olsen, & Eriksen, 2000; Dysvik, Vinsnes, & Eikeland, 2004), as well as decrease in pain following physical exertion and decrease in pain behaviors (Peters & Large, 1990).

Despite the obvious necessity of measuring pain in chronic pain patients, pain is difficult to measure. Given that pain is a unique experience to each individual, objective measures have remained elusive. Thus, researchers must rely on patients' subjective reports of pain. One of the most common scales of measurement involves the patient rating his or her pain on a scale of 0 to 10. This type of rating is still considered "state of the art" and thus normative data is unavailable.

Specific Outcomes of Effectiveness –Medication Usage

Medication reduction is a predominant goal of interdisciplinary treatment programs and has been studied as an outcome of interdisciplinary treatment. Opioid medication is one of the first lines of defense against chronic pain. Thus, the majority of chronic pain patients entering interdisciplinary treatment programs are currently prescribed one, if not multiple, medications. However, there is a long list of potential

side effects and, as some would argue, time limited effectiveness of medications (Turk, 2002). In fact, sensitization to opioid therapy has been acknowledged. Prolonged use has been thought to decrease sensitization of opioid receptors in the brain and increase endogenous opioids in the dorsal horn of the spinal cord. This increase in endogenous opioids has been found to actually increase pain sensitivity (Ballantyne & Mao, 2003).

A number of studies have evaluated the effectiveness of interdisciplinary treatment programs in reducing medication usage. Williams and colleagues (Williams, Richardson, Nicholas, Pither, Harding, Ridout et al., 1996) found significant decrease in drug use, opioid use, and nonsteroidal anti-inflammatory drug (NSAID) use following treatment. Similarly, one study found a 72% decrease in medication use following treatment. This decrease was primarily demonstrated through a decrease in the use of antidepressants and nonsteroidal anti-inflammatory medications. At the end of treatment, none of the participants were taking opioid medications (Hubbard, Tracy, Morgan, & McKinney, 1996).

Specific Outcomes of Effectiveness –Physical Functioning

Physical functioning is another studied outcome of interdisciplinary treatment programs, and appears under-emphasized in medication management for pain. Medication management focuses primarily on decreasing pain intensity. Level of functioning, in theory, is emphasized in medication management. However, functional outcomes, such as physical functioning and return to work are often ignored in clinical practice. Interdisciplinary programs have been found to be effective in the arena of physical functioning, as well as other domains. Significant increases in physical activity

has been reported in interdisciplinary programs, when measured utilizing self-report subjective measures (Dyskvik, Vinsnes, & Eikland, 2004), as well as when measured using multiple types of objective measures of physical abilities (Williams, Richardson, Nicholas, Pither, Harding, Ridout et al., 1996).

Specific Outcomes of Effectiveness –Return to Work

Given the indirect cost of chronic pain to society, in terms of lost wages and productivity and expenditures related to disability payments, return to work is another important outcome measure to be considered. There is mixed evidence regarding vocational outcomes following an intensive interdisciplinary program (Guzmán et al., 2002). However, the majority of studies have found positive outcomes following treatment in terms of return to work. Research indicates that interdisciplinary treatment programs result in a significant number of patients returning to work. One study found that 50% of participants returned to work, 35% of whom were employed full-time. For those working, the numbers of work hours increased on average by 15.47 hours per week (Hubbard, Tracy, Morgan, & McKinney, 1996). Additionally, evidence suggests that the amount of sick leave decreases significantly following treatment (Johansson, Dahl, Jannert, Melin, & Andersson, 1998). The meta-analysis by Flor and colleagues (1992) revealed that those individuals treated in an interdisciplinary treatment program were more likely than controls to return to work (68% versus 32%). Despite these positive results, one study indicated that women did not demonstrate the same positive outcomes as men and no differences were found between the interdisciplinary treatment group and treatment as usual group in terms of return to work. These findings remained stable at

12, 18, and 24 months. The authors offered no explanation of these results although they reported previous research has suggested that illness behaviors may be more present in women and women may be less career oriented (Skouen, Grasdal, Haldorsen, & Ursin, 2002).

Specific Outcomes of Effectiveness –Coping and Control

Investigation into the establishment of more adaptive coping mechanisms and the strengthening of a sense of control have been investigated as important outcomes of interdisciplinary treatment. There are multiple coping strategies that can be utilized to deal with pain. The task of the interdisciplinary treatment program is to identify those that are adaptive and those that are maladaptive and modify and reinforce as necessary. Research suggests that interdisciplinary treatment programs do an adequate job of addressing and improving coping style. Specifically, interdisciplinary treatment programs have shown to increase problem-focused coping, and decrease the use of emotion-focused coping and avoidance (Dyskvik, Vinsnes, & Eikland, 2004), as well as decrease the utilization of passive coping, catastophizing, and pain behaviors in managing the pain experience (Johansson, Dahl, Jannert, Melin, & Andersson, 1998). In terms of sense of control over the pain condition, perception of personal control has been found to increase from pretreatment to post-treatment. Specifically, internal sense of control increases and perception of external controls over pain decreases (Coughlin, Badura, Fleischer, & Guck, 2000).

Specific Outcomes of Effectiveness –Quality of Life

Outcome studies have found interdisciplinary treatment programs to be effective in increasing activity level in terms of increasing general activity, as well as social and recreational activity. Comparing interdisciplinary treatment to no treatment, activity level during leisure time was found to be higher at post-treatment for those who received treatment. Specifically, those who participated in an interdisciplinary treatment program reported greater "outdoor work", "social activities", and "general activity level" on the Multidimensional Pain Inventory (MPI), a measure designed to assess the impact of pain on multiple areas (Johansson, Dahl, Jannert, Melin, & Andersson, 1998). Hubbard and colleagues (1996) reported a 27% increase in recreational and social activities in their sample of chronic pain patients. Improved social functioning was observed in another treatment sample (Becker, Sjøgren, Beck, Olsen, & Eriksen, 2000). A 34% improvement in general health well-being (Hubbard, Tracy, Morgan, & McKinney, 1996) has been reported as well as a higher perception of general health following treatment (Becker, Sjøgren, Beck, Olsen, & Eriksen, 2000). Furthermore, home life in general was found to improve by 33% in one study (Hubbard, Tracy, Morgan, & McKinney, 1996).

Specific Outcomes of Effectiveness –Emotional Distress

Psychological disorders are common within chronic pain populations and can exacerbate the pain condition. Interdisciplinary treatment programs attempt to obtain outcomes of reduced emotional distress, and consequently mitigate the pain experience. In one study (Owen-Salters, Gatchel, Polatin, & Mayer, 1996), 100% of patents with chronic low back pain met criteria for somatoform disorders and 75.2% met criteria for

affective disorders. Decreases in emotional distress are expected, as interdisciplinary

programs include a psychological component to their treatment through psychoeducation,

relaxation, biofeedback, and counseling. Owen-Salters and colleagues found significant

decreases in psychopathology in their study population from baseline to six months post-

treatment. Specifically, individuals meeting criteria for somatoform disorder decreased

from 100% to 19.6% at six months post-treatment. The percentage of patients meeting

criteria for affective disorders decreased from 69.6% at baseline to 30.4% at six months

post treatment. For anxiety disorders, a nonsignificant increase was observed (16.8% at

baseline versus 23.2% at follow-up).

Elsewhere in the literature, decreases in overall psychological distress (e.g. Peters

& Large, 1990; Hubbard, Tracy, Morgan, & McKinney, 1996; Becker, Sjøgren, Beck,

Olsen, & Eriksen, 2000), as well as depression, catastophizing, hopelessness, and anxiety

(Williams, Richardson, Nicholas, Pither, Harding, Ridout et al., 1996) have been

reported. Contrary to these positive results, one study found that, for depression

specifically, depression scores were not significantly different in terms of changes from

pretreatment to post-treatment for patients who received interdisciplinary care when

compared to controls (Peters & Large, 1990). Despite this contradictory finding, the

general consensus among researchers and clinicians remains that decreasing level of

depression is one of the outcomes that is consistently and strongly found following an

interdisciplinary treatment program.

Long-Term Effectiveness

Although much research has been conducted regarding the short-term

effectiveness of interdisciplinary pain programs, limited research has been done

evaluating long-term outcomes of interdisciplinary programs. Those studies that have

been conducted have found evidence for the long-term effectiveness of such programs for

a significant portion of patients.

In a randomized control trial (Becker, Sjøgren, Beck, Olsen, & Eriksen, 2000),

individuals treated in an interdisciplinary treatment program were compared to a group of

patients treated by their general practitioner, as well as waitlist controls. Comparisons

were made immediately following treatment, as well as six months post-treatment. Those

treated in an interdisciplinary setting displayed significantly better outcomes than

controls at post-treatment and maintained their gains in pain intensity and general

psychological well-being at six months post-treatment.

Guck and colleagues (1985) conducted a long-term follow-up study comparing

individuals who completed a four week intensive interdisciplinary treatment program to

individuals who received no treatment. No differences were found between the two

groups at pretreatment. Individuals were evaluated prior to treatment and again one to

five years later. This comprehensive assessment of effectiveness analyzed many areas of

improvement. Overall success was defined as individuals meeting all of the following

criteria for success: employed or unemployed for reasons other than pain, receiving no

compensation for pain, no pain-related hospitalizations or surgeries following treatment,

and not taking prescription narcotic or psychotropic medications. Of those who

participated in the treatment program, 60% met criteria for success, while none of the

non-treated participants met criteria. On specific measures of outcome, those in the

treatment group showed significant improvements in pain severity, psychopathology,

number of hospitalizations for pain, activity level, daily activities, exercises, sleep, and

household, recreational, and social activities. In addition, individuals who received

treatment showed significant improvements in employment and medication usage. This

study demonstrated the far reaching positive impact of interdisciplinary treatment centers

on chronic pain patients. It further demonstrated that the gains achieved are maintained

for a significant amount of time following treatment.

Patrick and colleagues (2004) conducted a longer term follow-up study looking

at the sustainability of improvement 13 years after treatment in an interdisciplinary

program. They investigated improvements in pain intensity and interference, and

negative mood in a chronic low back pain population. They found that, at the 13-year

follow-up, treatment gains were maintained in all areas and even achieved greater

improvement in some areas than was evidenced at six months post-treatment. Over half

of their sample had returned to work, and the average general health was found to be

similar to normal age comparisons. These findings suggest that once improvements have

been made, they are sustainable, even in the context of aging.

A three-year follow-up study evaluating the maintenance of gains found that 39%

of patients maintained their improvements, while 36% had partial success in maintaining

their treatment gains. However, 23% failed to maintain gains. Interestingly, two

individuals of the 208 evaluated were classified as 'failed treatment' at the end of

treatment but were considered successful in their gains at follow-up (Maruta, Swanson, &

McHardy, 1990). Another study examining maintenance of treatment gains found

improvement in pain severity and physical functioning diminished at follow-up. In fact, physical functioning actually deteriorated to levels below those at pretreatment in this study (Joos, Uebelhart, Michel, & Sprott, 2004).

Just as there are non-responders to initial treatment, certain patients fail to maintain the benefits they received from treatment. Such factors as intervening life events, self-efficacy, and motivation can interfere with an individual's ability to continue to demonstrate progress. Overall, these findings suggest that for a significant portion of patients, treatment gains following an interdisciplinary treatment program are maintained over time.

Multiple Measures of Effectiveness

Most studies investigating the effectiveness of interdisciplinary pain programs focus on one outcome, e.g., pain ratings or return to work. Few studies have defined success as demonstrating improvements in multiple domains. In one study, however, success was defined as achieving moderate to marked improvement in three categories: modification of attitude, reduction in pain medication, and improvement in physical functioning. Of those who participated in an interdisciplinary treatment program, 20% were successful, 23% had partial success, and 7% had minimal or no improvement (Maruta, Swanson, & McHardy, 1990). As will be discussed in the methods section, this project defines success based on individual outcome variables as well as combined outcomes.

Summary of Effectiveness

Interdisciplinary treatment programs have been found to be effective in multiple domains, including decreasing pain, medication usage, and emotional distress and increasing physical functioning and coping. Multiple studies have demonstrated the effectiveness of these programs both in the short- and long-term. However, a limited number of studies have been done evaluating multiple areas of effectiveness.

MEASUREMENTS OF SUCCESS

As can be seen by the discussion above, multiple studies have examined interdisciplinary treatment programs and factors related to success. Some research studies focus on patient ratings of outcome, while others have focused exclusively on clinician ratings. Furthermore, criterion can range from stringent (i.e. obtaining change in multiple areas such as complete abstinence from medications, no increase in pain, and employed, in training, or running a household) to liberal (i.e. decrease in depression). Standardized criterion for measuring success has been lacking. Justification for the use of different measures is equally absent. Often success criteria may be relevant for one interested party (i.e. third party payers) but irrelevant to the patient (Turk, Rudy, & Sorkin, 1993).

In response to the lack of continuity in research, the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT; Dworkin, Turk, Wyrich, Beaton, Cleeland, Farrar, et al., 2008) was convened to establish guidelines for measuring success. Forty individuals participated in the consensus meeting and included individuals from universities, government agencies, pharmaceutical companies, and

patient self-help organizations. A consensus statement was produced during this meeting. It identified four core domains in pain outcomes: pain intensity, physical functioning, emotional functioning, and participant rating of improvement. It was recommended that at least two domains be utilized to measure clinically relevant improvement or worsening of the pain condition in research.

In terms of measurement of these four domains, the committee offered specific measures, as well as clinically relevant cut-off scores. For pain intensity, they recommended the use of a number rating scale, with a 10% to 20% change being minimally relevant. Physical functioning was stated to be of utmost importance to be included as one of the two domains utilized for measuring success.

The committee identified the Interference Scale of the Multidimensional Pain Inventory (MPI; Kerns, Turk, & Rudy, 1985) and the Interference Scale of the Brief Pain Inventory (BPI; Cleeland, & Ryan, 1994) as adequate for measuring changes in physical functioning. A change of one point on the BPI was offered as a benchmark of clinically relevant change. No benchmark was offered for the MPI.

For measurement of emotional functioning, two measures were identified as optimal for use by the committee: The Beck Depression Inventory, Second Edition (BDI-II; Beck, Steer, & Brown, 1996) and the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992). A change of five points on the BDI-II was identified as a reasonable estimate of clinically relevant change. For the POMS, a change of 10 to 15 is required.

The consensus for measuring patient rating of improvement was the use of a seven point rating scale. Options for ratings include "very much improved," "much improved," "minimally improved," "no change," minimally worse," "much worse," and

"very much worse." Clinically relevant changes are achieved when a rating of "very much" or "much" improved or worse are chosen.

This committee's goal was to identify clinically relevant criteria that would lead to greater continuity in research criteria (Dworkin, et al., 2008). One potential criticism of their recommended criterion is that they focused entirely on self-report, subjective measures of success. It is important to include objective measures of success as well. Despite this criticism, the identification of the four core domains is important when considering treatment success. The IMMPACT recommendations were utilized when selecting measures of success for this study. Given the criticism of the IMMPACT recommendations, objective measures of success were also utilized.

COST EFFECTIVENESS

An estimated 2.9 million Americans seek treatment from chronic pain specialists per year (Marketdata Enterprises, 1995). Adjusting for inflation, the health care costs associated with treatment at a pain-treatment facility is estimated to range between $1,380 and $97,670 per patient annually. The average cost is estimated to be $35,651 (Simmons, Avant, Demski, & Parisher, 1988). These figures factor in only health care costs and do not include estimates related to lost productivity and wages or costs related to disability compensation. These numbers speak to the costliness of chronic pain. Despite the expenditures on health care, relatively few people receive total pain relief from treatment interventions (Turk & Burwinkle, 2005). Given the costs to treat, an emphasis has been placed on identifying the most cost-effective treatment and modifying

available treatments to gain the most benefit for chronic pain patients for the least amount of money.

One of the first lines of defense against chronic pain is pharmacological interventions (Turk & Burwinkle, 2005). Few definitive numbers are available in terms of the cost of opioid treatment. However, it has been estimated that the average cost of oxycodone per year easily in excess of $5,000 (Kornick, Santiago-Palma, Moryl, Payne, & Obbens, 2003). In addition to the monetary expenses is the cost of side effects, potential abuse and dependence, and illicit selling and distribution of this type of medication (Turk & Burwinkle, 2005). Common side effects of opioid use include nausea, vomiting, lightheadedness, dizziness, and sedation (Abbott Laboratories, 2007). Other side effects that can occur include respiratory depression (Kornick, Santiago-Palma, Moryl, Payne, & Obbens, 2003). Long-term effectiveness data is scarce in regards to opioid treatments. The typical duration of long-term opioid therapy in the literature ranges from one week to several months (Turk, 2002).

The second line of defense is often surgical interventions for pain. Effectiveness data on surgical interventions is mixed and little long-term effectiveness has been shown (Turk & Burwinkle, 2005). One study evaluating the effectiveness of lumbar surgery found that over 67% of patients reported that their back pain had worsened and 55% indicated that their quality of life was unchanged or worse following surgery (Franklin, Haug, Heyer, McKeefrey, & Picciano, 1994). Despite the limited effectiveness data, a large number of surgeries are performed. For lumbar surgeries alone, it is estimated that approximately 317,000 are performed per year with an average cost of $25,000 per surgery (National Center for Health Statistics, 1998).

Regional anesthesia (i.e. nerve blocks, epidural steroids, local anesthesia) is another method for pain reduction. Immediate symptom relief can often be found from this type of intervention. However, the pain often returns within a very short amount of time (i.e. a few days to a few months). The annual cost for regional anesthesia is estimated to be over $1 billion (Turk & Burwinkle, 2005). The average cost of a single level injection is approximately $1965 within the Baylor University Hospital System. These injections are usually given in a series of three injections. Thus, if a patient received three injections per year, the annual cost would amount to $5895 for a procedure which provides only temporary relief (P. Behnk, personal communication, August 26, 2008).

As technology advances, treatment procedures and techniques become more sophisticated, but not necessarily more effective. Chronic pain patients have multiple medication, procedural, and surgical options available to them to treat their chronic pain. Despite these advances, many individuals fail to find relief from their pain and total cessation of pain is rare (Turk & Burwinkel, 2005).

It is estimated that about 6% of the 2.9 million Americans being treated annually by a pain specialist are treated in an interdisciplinary treatment program. Although there is some variability in cost, the average cost to treat one patient in an interdisciplinary program in 1995 was $8,100 (Marketdata Enterprises, 1995). Adjusting for inflation, this would translate to $14,000 per patient (Turk & Burwinkle, 2005). The interdisciplinary treatment programs at Baylor University Medical Center at Dallas cost approximately $4600 for the FIT program (two days per week for four weeks), and $13, 575 for the more comprehensive and intensive COP program (five days per week for four weeks).

These figures reflect the amount billed, but in reality only about 50% of the amount billed is reimbursed by insurance companies (M. Grazzini, personal communication, July 8, 2008). When compared to conventional treatments, interdisciplinary treatment programs are equally effective in reducing pain and more effective in functional restoration and reducing health care costs (Turk & Burwinkle, 2005). In the long-term, patients who receive treatment at an interdisciplinary treatment center function 75% better than those treated using other modalities (Flor, Fydrich, & Turk, 1992).

Financial savings following an interdisciplinary treatment for chronic pain are substantial. Flor and colleagues (1992) estimated that patients treated in an interdisciplinary program require one third the number or surgeries and hospitalizations than those treated by alternative methods and surgical interventions. Extrapolating from Flor and colleagues meta-analysis, Turk (2001) estimated that over the first year post-treatment, $20 million in savings would occur in health care consumption and compensation alone when compared to conventional treatment. Simmons and colleagues (1988) estimated that a 62% reduction in medical costs occurs following interdisciplinary treatment. Extrapolating from that study, and applying this number to the 2,318 patients successfully treated that were included in the meta-analysis by Flor et al. (1992), Turk (2002) calculated the savings in medical expenses alone in the first year post-treatment. He estimated a savings of over $18 million in health care expenses in the first year. Breaking it down further, Turk (2002) estimated a yearly savings per patient, subsequent to the first year, of $8,772. These extrapolated estimates show a consistent savings in health care costs following an interdisciplinary treatment program.

Another method for measuring cost-effectiveness is the increase in productivity of patients following treatment. Skouen and colleagues (2002) compared low back pain patients treated in an interdisciplinary treatment program (n=21) to a low back pain patients who were given 'treatment as usual.' Treating individuals with a light interdisciplinary program versus 'treatment as usual' resulted in net productivity gains of approximately $852,000 for the group for the first two years following treatment.

Despite the evidence for the clinical- and cost-effectiveness of interdisciplinary programs, the cost to treat chronic pain remains substantial. Given the expense of treatment, even in an interdisciplinary setting, enhancing our understanding of who benefits from treatment is warranted. Identifying variables related to treatment failure can not only result in interventions aimed at moderating the impact of such variables, but also to provide guidance regarding who is appropriate for treatment.

PREDICTORS OF OUTCOME

A large number of studies have been conducted evaluating predictors of treatment success, and a few have focused on predictors of treatment completion. These studies have been focused on narrow subsets of predictor variables and offer varying domains as important in predicting success. A few studies have focused on identifying predictors from a broad range of domains, while other studies have focused on more discrete categories of predictors. Specifically, studies have focused on: a) psychiatric variables as predictors, b) psychosocial factors as predictors, c) beliefs as predictors, and d) self-efficacy as predictors.

Predictors of Outcome—Multiple Domains

We made an initial attempt to begin to elucidate which factors are most predictive of treatment completion. A variety of variables related to a large number of domains were investigated. From this analysis, significant differences between graduates and non-graduates on age, distress, levels of depression and anxiety, number of emergency room visits and number of mental health visits in the year prior to treatment, perception of mental health, walking performance, and sense of life control were found. Further analyses revealed that the number of ER visits and anxiety level correctly classified 79.9% of patients. With each emergency room visit over the prior year, individuals were found to have a 20% greater risk of not graduating from the program. With each one-point increase on the BAI, individuals were found to have a 3% greater risk of not graduating from the program (Oslund, Robinson, Clark, Noe, & Garofalo, 2008).

Funch & Gale (1986) also examined the utility of multiple factors as potential predictors of treatment completion, including demographic, clinical, psychological, and social factors. One clinical factor, waking with pain, was found to be predictive of treatment completion, with patients who reported waking with pain being more likely to complete treatment. The strongest predictor of completion was the reaction of family members to the patient's pain. Those whose families were less supportive were less likely to complete treatment. One hypothesis for this is that family support may assist in maintaining motivation to change and serve as a means of increasing sense of self-efficacy, thus the individual is more likely to believe they can benefit from interdisciplinary treatment and will remain in treatment.

Predictors of Outcome—Psychiatric Comorbidity

Psychiatric illness is highly prevalent in chronic pain populations. Despite the recognition of the association between psychiatric difficulties and chronic pain, there is limited research on the effects of such illnesses on treatment of chronic pain. It would seem that presence and level of psychopathology should predict some of the variability in treatment outcomes.

In a study comparing individuals with and without Axis I and Axis II disorders, differential improvement rates were found between the groups. In the overall sample, 70% of patients had some type of Axis I disorder, 19% Axis II, and 54% had Axis I or Axis II traits. The success rate for the entire groups was 45% following a pain management program. Of those patients who did not have a psychiatric diagnosis, 86% improved. Only 32% of patients with Axis I disorders improved and 40% of those with Axis II disorders improved (Workman, Hubbard, & Felker, 2002).

Looking at multiple predictors of return to work, age, lifting ability, pain duration, depression level, and reported disability were each individually related to success. When examined in relation to each other, depression and age were the strongest predictors (Vowles, Gross, & Sorrell, 2004). Others have found defensiveness and anxiety to be related to treatment outcomes. Using the Anxiety Content Scale (designed to assess anxiety) and L Scale (to measure repression) on the MMPI-2, anxiety and repression predicted poor outcomes on physical outcomes. In addition, patients who utilized repression were less likely to benefit from treatment in terms of depression and pain severity (Burns, 2000).

Examining depression as a predictor of non-completion, Kerns and Haythornthwaite (1988), found that patients with severe depression were more likely to drop out of treatment than mildly depressed and non-depressed patients (82% versus 52% and 51%, respectively). However, of those who completed treatment, depression severity was not associated with improvement. King and Snow (1989) found that the opposite was true in terms of psychopathology and its prediction of premature termination. In their sample of chronic pain patents, they found that those who did not complete treatment had lower levels of pretreatment anxiety, fatigue, and mood disturbance than treatment completers. Looking at the MMPI, they found that those who completed treatment had higher pretreatment scores on Scale 1 (which measures preoccupation with physical functioning and physical damage), Scale 2 (which measures distress and dissatisfaction), Scale 3 (which measures need for approval and difficulty acknowledging painful conditions), and Scale 0 (which measures introversion and interpersonal discomfort). Those who failed to complete scored higher on the Es scale, which measures resiliency. These results may be due to non-completers being more defensive than those who complete treatment.

In another study, two types of headache patients were included in the analysis, those whose headaches were preceded by a traumatic event and those who had headaches without a preceding trauma. It was found that the MMPI was useful in discriminating drop-outs from non-drop-outs in the non-trauma headache patients. Elevated scores on Scale 4 (which is a measure of anger and a dislike of rules), Scale 6 (which measures degree of suspiciousness and over interpreting situations as directed toward self), and Scale 9 (a measure of psychic and physical energy), were predictive of non-completion.

No predictors were found for trauma headache patients. These results suggest that there is no single predictor of completion. In addition, level of adherence and factors related to adherence are different across pain conditions (Tsushima, Stoddard, Tsushima, & Daly, 1991)

Using the Personality Assessment Inventory to predict non-completion of an interdisciplinary treatment program, the Mean Clinical Elevations (MCE) and Treatment Process Index (TPI) scales were found to be useful scales. Specifically, those who failed to complete treatment were found to have higher levels of psychopathology (as measured by the MCE) and were less amenable to treatment (as measured by the TPI). The influence of motivation for treatment on completion was also investigated. It was found that for those who were resistant to treatment or hypermotivated, level of psychopathology was not useful in differentiating completers from non-completers. For those who displayed initial motivation, lower initial psychopathology was predictive of success (Hopwood, Creech, Clark, Meagher, & Morey, 2008).

The MPI is a commonly utilized measure that attempts to elucidate the psychosocial areas impacted by chronic pain and potentially predict treatment outcomes. Although the MPI is not considered to assess psychiatric disorders, it does focus on relevant psychosocial areas, such as affective distress and perceived social support. One study investigated the use of the MPI coping profile groups in predicting treatment outcomes. Interdisciplinary treatment was effective in significant improvement in a wide array of areas for all of the coping profile groups. However, the groups specifically were not found to be predictive of improvement (Gatchel, Noe, Pulliam, Robbins, Deschner, Gajraj et al., 2002).

Predictors of Outcome—Beliefs

Beliefs can influence not only thoughts, but also behaviors and emotions. Thus it would seem likely that patient beliefs would predict treatment outcomes. Changes in beliefs have been found to be predictive of improvement following an interdisciplinary treatment program. Specifically, changes in beliefs related to 'pain as illness' accounted for 17% and 20% of the variance in improvement in depressive symptoms and physical functioning, respectively, from pretreatment to follow-up. Thus, individuals who were able to recognize the impact of psychological variables on their pain were more likely to improve following treatment. Decreases in helplessness accounted for 12% of the variance in pain-related physician visits (Jensen, Turner, & Romano, 1994).

In a chronic low back pain sample, improvement in reported disability was associated with a reduction in patients' dysfunctional 'organic' beliefs about the nature and treatment of their pain (Walsh & Radcliffe, 2002). These findings suggest that the ability to go beyond the idea of pain as solely a physiological phenomenon was predictive of greater benefits from treatment. Similarly, Jensen, Turner, and Romano (2007) found that increases in depression and disability from post-treatment to 12 months follow-up were predicted by increases in 'maladaptive' beliefs (i.e. catastrophizing, belief that one is disabled) and a decrease in 'adaptive' beliefs (i.e. beliefs that one has control over pain).

In order to identify variables early in treatment that are predictive of both positive and negative outcomes, investigating the impact of specific beliefs is warranted. Pretreatment beliefs were found in one study to account for 30% of the variance in improvement in terms of physical abilities and changes in beliefs from pretreatment to

post-treatment were found to account for another 26% of the variance. Specifically, decreases in the use of catastophizing and beliefs about the negative consequences of pain were found to be most predictive. In terms of mental well-being, pretreatment cognitive processes accounted for 37% of the variance in improvement and changes in beliefs accounted for an additional 23% of the variance. The most predictive changes were decreases in hypervigilance to pain, emotional responses to pain, and increases in the understanding of pain (Moss-Morris, Humphrey, Johnson, & Petrie, 2007).

Predictors of Outcome—Self-Efficacy

Although self-efficacy has not been investigated as a predictor of who completes, or successfully completes an interdisciplinary program, preliminary work suggests that this would be an important variable to consider as a predictor. Examining the association between self-efficacy and pain intensity and coping, Lin and Ward (1996) found that patients' perceived ability to cope was associated with pain intensity and interference of pain in daily life. Those patients who believed in their ability to cope had lower levels of pain and less interference of pain in daily life. Further, self-efficacy was associated with perseverance in coping. In turn, perseverance in coping was correlated with pain intensity and pain interference. Thus, those with a perceived sense of self-efficacy had better outcomes in terms of the pain experience and the impact of pain.

In addition to the previously investigated domains, the current project examined type of insurance, age, and chronicity of pain condition as potential predictors of completion and success. Specifically, type of insurance may impact the type of treatment

that the patient is able to attend, and older patients and those with a longer duration of pain may be less able to fully engage in interdisciplinary treatment programs.

Predictors of treatment success and completion are important in terms of cost-effectiveness. Using predictors as a means to tailor treatment by focusing on dampening the negative effects of variables on non-completion will no doubt allow for a more clinically and cost-effective treatment approach. Despite the large number of research studies, no single study has been done that investigates and compares all of the different variables in terms of both treatment completion and success. By utilizing a more comprehensive approach, understanding of predictor variables and their contribution to treatment completion can be enhanced.

TREATMENT INTENSITY (DOSE RESPONSE)

Although extensive research has been conducted examining the outcomes of interdisciplinary pain programs, research regarding the duration and frequency of physical therapy, psychoeducational groups and behavioral medicine sessions has been rare. Furthermore, there are no studies that investigate factors that may predict which level of treatment intensity is optimal for an individual patient. Four studies provide preliminary information concerning treatment intensity.

Williams and colleagues (1999) randomly assigned chronic pain patients who were willing to be randomly assigned to inpatient treatment, outpatient treatment, and waitlist control. Those who were not willing to engage in random assignment were assigned to the treatment of their choice. Few differences were found between randomly assigned and non-randomly assigned patients. Those treated in an inpatient setting did

better overall than those treated in an outpatient setting. All those treated, regardless of setting, fared better than waitlist controls. At one year, treatment gains were maintained more in the inpatients than outpatients.

Utilizing random assignment, Turner-Stokes and colleagues (2003) compared group based treatment to individual treatment. No group differences were found in pain interference, control over pain, depression, and analgesic drug use at the end of treatment and at 12-months follow-up. Pain severity decreased in both treatment conditions at end of treatment, although there was an increase at six and 12 months. No group differences were found in anxiety. However, those in the individual treatment condition showed significant reductions in anxiety, which was maintained at 12 months. Those treated in the group setting did not show a significant reduction and showed an increase in anxiety at six months. In the realm of general activity, those treated in the group treatment condition showed increases in ability to engage in day-to-day activities at end of treatment, although it declined somewhat at the six month follow-up. No differences were found between the two groups in terms of general activity level at two or 12 months. In terms of cost of treatment, the groups treatment was more expensive than the individual treatment program. This finding is surprising, as group-based treatment is often more cost-effective. The authors contributed this finding to the group size. The average group size contained approximately two patients less than most standard group treatments. Thus, the cost per patient was higher than expected. Overall, the study found that individual and group treatments appear to be similar in effectiveness. Those treated in a group setting tended to make more rapid treatment gains, but gains tended to diminish. Those treated in an individual setting were slower to make gains, but

maintained them better over the long term. The authors suggested that, although the group based approach was marginally more expensive, treatment model choice may be more heavily influenced by space and staffing issues.

Functional restoration programs focus on improving physical functioning, quality of life and emotional well-being. Ultimately, most have the final overarching goal of returning patients to work. Comparing functional restoration programs to weekly physical therapy, Jousset and colleagues (2004) attempted to compare two different treatment programs. They found that chronic pain patients treated in a functional restoration program had fewer sick-leave days and were in better physical condition than those who were treated with physical therapy only. No between group differences were found in the areas of pain intensity, quality of life, psychological characteristics, health care utilization, and drug intake following treatment (Jousett, Fanello, Bontoux, Dubus, Billabert, Vielle et al., 2004).

One of the few studies to compare varying intensities of the same treatment was done by Haldorsen and colleagues (2002) and examined differences in return to work rates. Treatment as usual, light interdisciplinary and extensive interdisciplinary treatment were compared. In addition to comparing varying intensities of treatment, patients were broken down into groups according to prognosis, specifically into good prognosis, moderate prognosis, and poor prognosis. Overall, it was found that light and extensive interdisciplinary treatment programs were more effective in terms of return to work than treatment as usual. For those chronic pain patients classified as having good prognosis prior to treatment, no treatment was more advantageous than the others. For patients with a moderate prognosis at treatment initiation, the light multidisciplinary program appeared

to be of great enough intensity to produce return to work. Extensive treatment did not produce any greater benefit and those treated with treatment as usual did not do as well in patients with moderate prognosis. For those with poor prognosis at treatment initiation, extensive interdisciplinary treatment was significantly better at producing return to work than both the light interdisciplinary treatment and treatment as usual. This study provides support for the notion that treatment intensity does make a difference and that different types of patients require different intensities of treatment to show improvements. However, only return to work was investigated in terms of success. Further research is warranted with a more comprehensive analysis of success rates.

Overall, these studies indicate that a comprehensive approach to pain management is the ideal. Little difference was found, in terms of outcome among the different comprehensive approaches when patients were evaluated as a homogenous group. When patients were broken down into more heterogeneous groups, response differences were found among groups. This speaks to the need to tailor treatment according to specific patient characteristics. However, no study to date was found in which a comprehensive evaluation of the impact of treatment intensity on varying types of patients has been done.

NEED FOR TAILORED TREATMENT

When comparing different types and intensities of treatment, researchers often consider their sample of chronic pain patients as one homogenous type of patient. When patients are grouped together, they are often grouped according to diagnoses. Unfortunately, diagnosis is a reference to location of pain and does not take into account

underlying physical or psychological pathology (Turk, 2005). Additionally, certain pain conditions have relatively low prevalence rates. At any given time, a treatment program may include individuals with more common disorders, such as fibromyalgia or low back pain, as well as individuals with rare conditions, such anklyosing spondylitis, occipital neuralgia, and thoracotomy pain. When such a wide range of pain conditions are present in a treatment sample, it is impossible to conduct studies with homogenous pain groups.

Interdisciplinary treatment programs attempt to target factors that contribute to and exacerbate pain. They do not pretend to treat the totality of the pain condition, but attempt to improve quality of life and functioning. Despite the recognition that chronic pain encompasses more than merely the identification of the location of pain, interdisciplinary treatment programs tend to fall into the same trap that many treatment modalities do: lumping all chronic pain patients into one homogenous category. Treatment is often provided in a group format with every patient receiving the same treatment with little or no variability between each individual. Given that pain is a unique and personal experience, this one-size-fits-all approach is lacking (Turk, 2005).

Studies have been done in an attempt to identify different types of chronic pain patients. Using the MPI, Turk and Rudy (1988) identified three clusters of patients: dysfunctional, interpersonally distressed, and adaptive copers. These groups represented different types of patients who displayed different perceptions of and difficulties related to their pain condition. This classification system has been replicated in several studies over a variety of pain conditions (e.g., Turk & Rudy, 1990; and Olsson, Bunkertorp, Carlsson, & Styf, 2002). Utilizing these classifications, Turk and colleagues (1996) conducted a preliminary study in which it was shown that the three groups had

differential responses to interdisciplinary treatment. The authors suggested that classification of chronic pain patients and subsequent tailoring of treatment could lead to more clinically and cost-effective treatments.

Adding to the use of the MPI, Burns, Kubilus, Breuhl, and Harden (2001) added a fourth cluster to the MPI classification system, repressors. This fourth group was similar to the dysfunctional group in terms of physical symptoms, but more similar to adaptive copers in terms of psychological variables. It was hoped by the authors that the addition of the fourth cluster would aid in treatment planning. Other studies have supported the incremental validity of the addition of this fourth cluster (e.g., Hopwood, Creech, Clark, Meagher, & Morey, in press). This fourth cluster provides further support for the heterogeneity of chronic pain patients.

The MMPI-2 has been one of the most widely used instruments in attempts to classify different types of chronic pain patients. Keller and Butcher (1991) identified three independent groups of chronic pain patients for men and women. For men, the groups were "general elevation," neurotic triad," and "within normal limits." For women, the groups were nearly the same, although the "within normal limits" groups could be considered a low "Conversion-V" profile. Bradley and colleagues (1978) identified three male and four female profiles on the MMPI with a chronic pain sample. The three male profiles were also found with females, with the first having elevations on Scale 1 (which measures preoccupation with physical functioning and physical damage), Scale 2 (which measures distress and dissatisfaction), and Scale 3 (which measures need for approval and difficulty acknowledging painful conditions). The second group was characterized by a high scale K (indicating a compromised ability to cope with

difficulties) and elevations on Scale 1 and Scale 2. The third group had elevations on Scale 1, Scale 2, Scale 3, and Scale 8 (which measures ability to think clearly and having a sense of being damaged). The fourth female profile was the traditional Conversion V profile.

Guck and colleagues (1988) found similar profiles in their sample to those identified by Bradley et al. This particular study extended the scope of analysis to identify any differences in outcomes among the groups following an interdisciplinary treatment program. At pretreatment, the three male subgroups differed on multiple pretreatment variables, including marital status, age, length of pain, and number of pain related medical treatments. The female subgroups did not differ significantly on any of the pretreatment variables. At post-treatment, the male subgroups differed only on pain severity rating for good days and number of hospitalizations since treatment. No significant differences were found between the female subgroups on any of the post-treatment outcomes.

Using a different set of measures, Sanders and Brena (1993) grouped pain patients into four different clusters using the Sickness Impact Profile and Medical Examination and Diagnostic Coding System. Individuals were grouped according to level of functioning and physical pathology. Group A consisted of patients rated as highly dysfunctional with moderate levels of physical pathology. Group B consisted of individuals who were moderately dysfunctional with moderate levels of physical pathology, Group C of individuals who were highly functional and had low levels of physical pathology. Group D was highly dysfunctional with low levels of physical pathology. Using their four groups, the authors attempted to compare treatment response

across groups. All groups showed similar improvements in pain intensity. Additionally, medication usage was similar at follow-up. Group differences were noted in activity level, with patients in Groups A and D were less active than Groups B and C at pretreatment but showed significant improvement in activity level at follow-up. Patients in Groups B and C did not show significant increases in activity level. All of the groups showed significant changes in work status except group B. These findings suggest that small differences were noted in treatment outcome between groups. However, there were a great deal of similarities. These similarities may be due to the measures utilized in grouping patients, and may not have accurately identified truly heterogeneous groups.

Numerous research studies (e.g., Funch & Gale, 1986; Workman, Hubbard, & Felker, 2002; Hopwood, Creech, Clark, Meagher, & Morey, 2008) have been conducted in an attempt to elucidate factors related to differential outcomes (i.e. success versus failure, completion versus non-completion). However, limited attention has been given to utilizing these identified characteristics to tailor treatment. Of those that have compared differential responses to treatment between groups of patients, little differences have been found. Thus, it bodes the question of whether or not sufficient methods of separating chronic pain patients into homogenous groups of patients has been achieved. Attempts to identify adequate methods of grouping patients and identifying who fails to benefit from treatment could lead to a tailored approach to treatment.

THIRD PARTY PAYER

By tailoring treatment or identifying individuals who would be more appropriate for other treatment modalities, interdisciplinary treatment programs would become even more clinically impactful and cost-effective. With increasing pressure from third party payers to manage the cost of patient care, identifying relevant patient variables that assist in determining the appropriate level of treatment type and intensity is needed.

Robbins and colleagues (2003) noted that despite the effectiveness of interdisciplinary treatment programs, third party payers are attempting to eliminate vital aspects of treatment. Thus, chronic pain patients are not able to fully participate in an interdisciplinary treatment program. In an attempt to assess the potential harmfulness to the individual patient and impact on the effectiveness of treatment, Robbins et al. compared two groups of chronic pain patients: those who received all areas of treatment and those who received treatment without the physical therapy component. Those who did not receive the physical therapy component were functioning significantly worse post-treatment and at one year follow-up in comparison to those who received physical therapy.

These findings speak to the issues related to expectations of third party payers. As interdisciplinary treatment programs struggle to find a balance between providing best care and being reimbursed for services, often times essential components of treatment are dropped. Thus, having research data to support the notion that each component of treatment is essential. In addition, by identifying patient variables which could assist in identifying the most appropriate treatment, interdisciplinary treatment programs can

increase clinical and cost effectiveness, thus reinforcing their necessity to managed care companies.

SCOPE OF CURRENT ANALYSIS

Interdisciplinary treatment programs for chronic pain have been shown to be effective. However, not all pain participants complete programs or achieve their stated functional, vocational or pain management goals (Turk & Okifuji, 2002). With increasing pressure from third party payers to manage the cost of participant care, identifying relevant participant variables that assist in determining the appropriate level of treatment intensity is needed. Furthermore, despite the NIH consensus statement (1996) stressing the importance of tailoring treatment to participant needs, insufficient research has occurred in this area to date.

The current project examined factors that are associated with treatment completion, as well as success in those individuals who do complete treatment. This project also examined clinically relevant variables that can be used in determining appropriate treatment intensity for patients with chronic pain. We hypothesize that identification of relevant participant variables will lead to interventions early in treatment aimed at minimizing attrition, maximizing benefits, and increasing cost effectiveness.

Primary Aims

In the context of the above goals, the following aims and hypotheses were investigated:

Aim One

Identify predictors of graduation among participants at an interdisciplinary treatment center, collectively and across different treatment intensities.

Hypothesis A

It was hypothesized that levels of affective distress and health care utilization would predict significant rates of non-completion. Specifically, participants who reported higher degrees of affective distress and greater health care utilization would be less likely to graduate.

Hypothesis B

It was hypothesized that affective distress and health care utilization would account for different degrees of variance in graduation rates among the focused interdisciplinary treatment (FIT) program, modified comprehensive outpatient program (MCOP) and comprehensive outpatient program (COP).

Aim Two

Identify predictors of successful outcome among graduating participants collectively and across three interdisciplinary treatment programs. Five different definitions of success were applied based on the IMMPACT committee's (Dworkin, et al., 2008) recommendations and the recommendations of clinicians working in the pain management program. These measures of success focused on the individual participant's perception of improvement, decrease in levels of depression, objective measures of

physical improvement, decrease in the individual's perception of pain severity, and increase in sense of self-efficacy.

Hypothesis C

It was hypothesized that predictors of success would vary among the five different definitions as outlined below:

1. *Success defined as self-reported improvement*: Individuals with a higher degree of baseline self-efficacy and lower levels of affective distress would be more likely to rate themselves as improved.

2. *Success defined as decrease in depression*: Individuals with higher levels of activity at baseline would be more likely to have a clinically significant decrease in self-reported depression scores.

3. *Success defined as improvement in physical functioning*: Individuals with a higher degree of baseline self-efficacy and lower levels of perceived physical dysfunction at baseline would be more likely to improve in physical functioning.

4. *Success defined as decrease in perceived pain severity*: Individuals with lower levels of distress and higher levels of activity at baseline would be more likely to have a clinically significant decrease in perceived pain severity.

5. *Success defined as increase in self-efficacy*: Individuals who had lower levels of baseline affective distress would display greater increases in self-efficacy.

CHAPTER THREE
Methodology

SUBJECTS

The sample of subjects included was comprised of all patients treated in the Interdisciplinary Pain Management Programs at Baylor University Medical Center since 2001. The participants represented a heterogeneous sample of chronic pain patients.

Over 500 individuals have been treated in the comprehensive outpatient program (COP), over 60 in the modified comprehensive outpatient program (MCOP), and over 250 in the focused interdisciplinary treatment program (FIT). Data collection has been conducted for quality assurance purposes with every patient that has entered the programs. For the purpose of this study, outcome measures collected through late fall of 2008 were utilized. Given the difference in number of individuals that have been treated in the three treatment programs, analyses of data was initially conducted with all of the treatment programs combined; additionally, each of the programs were investigated individually.

PROCEDURE

Approval from the Baylor University Medical Center Institutional Review Board was obtained prior to the initiation of this project. Additionally, the study was registered through the Institutional Review Board at The University of Texas Southwestern Medical Center at Dallas. The project examined retrospective data from a chronic pain population of approximately 900 individuals who had initiated treatment at Baylor University Medical Center's interdisciplinary pain management programs.

Individuals were assessed by an interdisciplinary team following referral from their physician for intractable pain and were assigned to one of the three outpatient interdisciplinary treatment programs based on a number of factors. Official assignments were made by the evaluation team based on factors including the severity of the pain condition, ability to commit to the treatment program, and the individual's geographic location. Once assigned to a treatment program, individuals were assessed prior to treatment entry and after completion on a variety of psychological, physical, and social dimensions.

The three treatment programs were comprised largely of the same components. However, the treatment programs differed in the amount of treatment received (see Table 1). Furthermore, the least intensive program, the focused interdisciplinary treatment (FIT) program, did not include aquatics exercise, nor did it include a separate relaxation group. Instead relaxation training was incorporated into individual and group education sessions.   The programs were modified slightly for each patient, depending on their individual goals.

COMPONENTS OF TREATMENT

Physical Therapy

Physical therapy was conducted by a licensed physical therapist or licensed physical therapy assistant. Stretching and conditioning plans were introduced and individual programs were developed and implemented for each patient. Goals of physical therapy included increasing conditioning, decreasing pain, maintaining and/or increasing mobility, and challenging the perception that activity increases pain.

Educational Groups

Education groups were led by either a licensed psychologist or licensed professional counselor. Utilizing a cognitive-behavioral model, these groups focused on teaching patients how to cope more adaptively with their difficulties, as well as decrease emotional distress. The group included both an educational and a group process element. The skills emphasized in group included stress management, problem-solving, communication, and cognitive-behavioral techniques for reducing depression and anxiety. In addition, the patients were taught about the mind/body relationship and trained how to modify their pain experience and enhance their health.

Individual Behavioral Medicine

Individual behavioral medicine sessions were conducted by a licensed professional counselor. A cognitive-behavioral therapy (CBT) approach was taken and misconceptions about pain and catastrophizing about pain were addressed via cognitive restructuring. Within the context of a CBT approach, patients received skills training utilizing biofeedback and instruction in relaxation techniques to increase self-efficacy. In addition, psychopathology, as well as other emotionally distressing elements of their life, were discussed and managed. The importance of clinicians with strong clinical skills cannot be overstated, as it is the non-specific factors of empathy, warmth and concern for a patient's well being which will translate into significant improvement in a patient's life.

Relaxation Training Group

Relaxation training group sessions were conducted by licensed professional counselors and occupational therapists. Patients were taught techniques, such as progressive muscle relaxation, visualization, and guided imagery, Relaxation techniques are typically used to reduce anxiety, and decrease muscle tension and pain.

Aquatics Therapy

Aquatics therapy was led by a licensed physical therapist or physical therapy assistant. Participants were taught stretching and conditioning methods in a swimming pool. A weightless environment for exercise helped many participants overcome their fear of physical activity that developed in response to their pain.

Occupational Therapy

Occupational therapy included a variety of components, such as educational groups and vocational groups. Group topics included pacing, time scheduling, body mechanics, adaptive living techniques, ergonomics, recreational adaptations, spirituality, and nutrition. For those interested in returning to work, vocational groups focused on reducing barriers to returning to work, exploring interests and abilities, and identifying and exploring resources.

TREATMENT PROGRAMS

Multiple team members worked collaboratively to provide treatment in each of the programs (see Table 1). Team members included the referring physician, licensed clinical psychologists, licensed professional counselors, physical therapists, physical therapy assistants, occupational therapists, and case managers. Each team member served a specific, integral function in the treatment program.

Comprehensive Outpatient Program

The Comprehensive Outpatient Program (COP) consisted of a total of 120 hours of treatment. Patients were seen for six hours per day, five days a week, for four weeks. The patients received a total of 19 sessions each of physical therapy, group education, and occupational therapy. They also received 17 sessions of aquatic exercise, 8 sessions of individual behavioral medicine, and 12 relaxation sessions. The comprehensive program at Baylor University Medical Center at Dallas has been accredited by CARF since 1997.

Modified Comprehensive Outpatient Program

The Modified Comprehensive Outpatient Program (MCOP) consisted of a total of 72 hours of treatment. Patients were seen for six hours per day, three days a week, for four weeks. The patients received a total of 15 sessions each of physical therapy, aquatics exercise, and group education, 10 sessions each of individual behavioral medicine and occupational therapy, and 5 sessions of relaxation group.

Focused Interdisciplinary Treatment

The Focused Interdisciplinary Treatment (FIT) program consisted of a total of 24 hours of treatment. Patients were seen three hours per day, two days per week, for four weeks. This included eight sessions each of individual behavioral medicine, physical therapy and group education. Occupational therapy was added when available, averaging about four sessions.

INSTRUMENTS AND OUTCOME MEASURES

Measures were given to patients at the initial evaluation and the first day of treatment, as well as on the last day of treatment. Measures which looked at psychosocial factors and emotional distress were given by a licensed professional counselor. Physical therapy measures were conducted by a licensed physical therapist or physical therapy assistant.

Daily Life Questionnaire

The Daily Life Questionnaire (DLQ) is a self-report questionnaire which was developed specifically for the pain program. It was designed to obtain demographic information, as well as information about the chronicity of the pain condition, health care utilization, hours resting per day, and insurance provider.

Beck Depression Inventory- Second Edition

The Beck Depression Inventory-Second Edition (BDI-II; Beck, Steer, & Brown, 1996) is a 21 item self-report measure aimed to align with the diagnostic criteria for

depression found in the Diagnostic and Statistical Manual, fourth edition (DSM-IV; APA, 1994). Each item consists of a four-point response set attempting to measure the severity of the depression. Internal consistency reliability estimates have yielded a coefficient alpha of .92 for outpatients and .94 for college students. One week retest yielded a significant test-retest correlation of .93. The BDI was found to have adequate construct and factorial validity.

Beck Anxiety Inventory

The Beck Anxiety Inventory (BAI; Beck & Steer, 1990) is a 21 item self-report measure of symptoms common to anxiety. Individuals are asked to rate their experience of each symptom item on a four-point scale from 0 to 3. The Beck Anxiety Inventory was designed to discriminate anxiety from depression. The BAI has been found to have high internal consistency (Cronbach coefficient alpha = .94) in patients diagnosed with anxiety disorders. Test retest reliability after a one-week time period was .75. Concurrent validity with other measures of anxiety ranged between .47 and .58. The BAI has been found to have adequate construct and discriminant validity as well.

Multidimensional Pain Inventory

The West Haven Multidimensional Pain Inventory (MPI: Kerns, Turk, & Rudy, 1985) was designed specifically for chronic pain populations as a means to comprehensively assess the individual's pain experience. It consists of 52 items broken down into three different sections. The first section examines the impact of pain on the individual's life, the second section the individual's perception of the response of

significant others to their pain, and the third section is meant to assess the individual's

involvement in daily activities. The items are further broken down into 12 scales. Each

item is rated by the patient on a Likert-type scale. A short form of the MPI is utilized

frequently in practice and consists of eight questions. It consists of four scales: pain

severity, emotional distress due to pain, interference of pain on functioning, and control

over pain. The full MPI has been demonstrated high levels of internal consistency for all

scales (ranging from 0.70 to 0.90). Test retest reliability ranged from 0.62 to 0.91 for all

scales, indicating that these scales remain stable over time.

Medical Outcomes Survey 12-Item Short Form Health Survey

The Medical Outcomes Survey 12-item Short Form Health Survey (SF-12; Ware,

Kosinski, & Heller, 1996) is a generic measure of health status. It is a shortened version

of the original SF-36. The SF-12 is comprised of two scales, the physical and mental

component summary scales. Each item on the measure is rated by the patient on a five

point Likert scale. The SF-12 has demonstrated adequate test-retest reliability for both

the physical and mental component summary scales (0.89 and 0.76 respectively). The

median relative validity estimates for the physical and mental component summary scales

were 0.67 and 0.97, respectively.

Physical Therapy Measures

Physical therapy measures utilized were objective measures of physical

functioning. The first measure, *walking,* was the number of laps walked during a five

minute interval. The second measure, *standing,* was number of repetitions of sitting to standing in one minute.

SUMMARY OF DESIGN AND SATISTICAL ANALYSIS

The current study examined predictors of treatment completion and success among three different treatment programs. Assessments were given prior to and immediately following treatment. In order to control for potential biases among treatment sites, demographic variables were also investigated. Appropriate statistical controls, including analyses of covariance, were implemented to manage biases when present. Pre-treatment measures were utilized as potential predictors of treatment completion success. In addition, they were utilized to identify relevant variables and corresponding cut-scores which could be utilized in clinical practice for determining appropriate intensity.

Hypothesis A

It was hypothesized that higher levels of affective distress and health care utilization at pre-treatment would predict significant rates of non-completion.

Dependent Variable

Participants were classified as graduates if they completed the entire four weeks of the program. Those who failed to complete the entire four weeks of treatment, were classified as non-graduates.

Predictor Variables

Predictors of success included the following variables and pretreatment measures:

a) Affective Distress

    a. Beck Depression Inventory, Second Edition (BDI-II; Beck, Steer, & Brown, 1996)

    b. Beck Anxiety Inventory (BAI; Beck, 1993)

b) Health care utilization (number of surgeries, treatment procedures, physician visits, and emergency room visits over the 12 months prior to treatment entry)

c) Age

d) Activity level (as measured by hours resting per day)

e) Chronicity of pain condition (as measured by number of months the pain condition has existed)

f) Type of insurance carrier

g) The Multidimensional Pain Inventory (Kerns, Turk, & Rudy, 1985) provided information about the individual's perception of the impact of pain on his or her life, the individual's perception of the response of significant others to his or her pain, and the individual's involvement in daily activities

h) Physical therapy measures included number of laps walked over five minutes, and number of repetitions of sitting to standing in one minute.

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Analyses

Forward binary logistic regressions were utilized to identify predictors. Logistic regression analyses allow for analysis of the probability of an event. Utilization of a logistic regression allows for use of a categorical (or in this case binomial) dependent variable. A *forward* binary logistic regression was utilized, as it allows for variables to be entered into the equation in a stepwise manner.

By utilizing regression analyses, multicollinearity was addressed and additional statistical corrections, such as the bonferroni correction, were not needed. Given the large number of predictor variables, correlational analyses were performed to identify highly correlated variables to address multicollinearity. Multicollinearity impairs the ability to accurately determine the precise power of each individual predictor from the entire group of predictors. If variables were highly correlated (i.e. a correlation greater than 0.30), only one variable was used in the forward binary logistic regression.

A forward binary logistic regression (see Figure 1) was conducted to determine the amount of variance accounted for by the different predictors of treatment completion for the entire sample. An odds ratio was conducted and effect sizes were calculated. An odds ratio is a ratio of the likelihood of an event happening in one group compared to the odds of it happening in another group. An odds ratio of greater than one suggests that an event is more likely to occur in the first group, and less likely to occur if the odds ratio is less than one. We predicted that the odds ratio would be significant for affective distress and health care utilization in this analysis. Therefore we expected the odds ratio to be less than one for those participants who reported higher degrees of affective distress and

greater health care utilization, meaning an odds ratio of less than one would indicate less chances of graduating.

Hypothesis B

It was hypothesized that affective distress and health care utilization would account for different degrees of variance in graduation rates among the FIT, MCOP and COP programs.

Dependent Variable

Participants were classified as graduates if they completed the entire four weeks of the program. Those who failed to complete the entire four weeks of treatment were considered non-graduates.

Predictor Variables

Predictor variables utilized were the same for this analysis as the ones used for the previous analysis.

Analyses

Given the large number of predictor variables, a correlational analysis was conducted to identify highly correlated predictors, and only one was selected for use in the forward binary logistic regressions, to address multicollinearity. Three forward binary logistic regressions were conducted (see Figure 2) to determine the amount of variance accounted for by the different predictors of graduation for each of the treatment

programs (FIT, MCOP, and COP). Odds ratios for each treatment program were be

calculated. We predicted that the odds ratio will be significant for affective distress and

health care utilization for this analysis. A second forward binary logistic regressions was

run and predictor variables found to be significant from the first analysis were combined

with the additional variable of treatment type (FIT, MCOP, and COP). This analysis

allowed for the investigation into whether the treatment type engaged in impacts

graduation rates.

Hypothesis C

It was hypothesized that predictors of success would vary among the five different

definitions of success. Actually hypotheses are stated below.

C1: Success Defined as Self-Reported Improvement

Individuals with a higher degree of baseline self-efficacy and lower levels of

affective distress would be more likely to rate themselves as improved.

Dependent Variable

Self-improvement data was measured by participants' self-report of improvement

at the end of treatment. Individuals who ranked themselves as "very much improved" or

"much improved" following treatment were considered "successful."

Predictor Variables

Predictors of success investigated included the pre-treatment measures of the following:

  a) Affective distress (BDI-II; BAI)

  b) Health care utilization (number of surgeries, treatment procedures, physician visits, and emergency room visits over the 12 months prior to treatment entry)

  c) Self-efficacy (control scale of the MPI short-form)

  d) Age

  e) Chronicity of pain

  f) Activity level (hours resting per day)

  g) Physical therapy measures

  h) Perceived physical dysfunction (SF-12 Physical Health Scale)

  i) Insurance type

Analyses

To address multicollinearity, a correlational analysis was run to identify highly correlated predictors, and only one was selected for use in the forward binary logistic regressions. A forward binary logistic regression analyzing all graduates, regardless of treatment program (See Figure 3), was conducted to determine the amount of variance accounted for by the different predictors of success. Additionally, forward binary logistic regressions were conducted for each of the treatment programs to determine if differences in predicted variance existed among the three programs (see Figure 4). Odds ratios were

also calculated. We predicted that the odds ratio would be significant for self efficacy and affective distress for these analyses.

C2: Success Defined as Decrease in Depression

Individuals with higher levels of activity at baseline would be more likely to have a clinically significant decrease in self-reported depression scores.

Dependent Variables

Depression was measured using obtained scores on the BDI-II. Change scores were calculated (pre BDI-II sore – post BDI-II score/ pre BDI-II) and participants were classified as either "successful" (decrease of at least 20%) or "non-successful" (decrease of less than 20% or increase).

Predictor Variables

Predictors of success investigated included the measures utilized in the previous analysis.

Analyses

To address multicollinearity, a correlational analysis was run to identify highly correlated predictors, and only one was selected for use in the forward binary logistic regressions. A forward binary logistic regression analyzing all graduates, regardless of treatment program (see Figure 3), was conducted to determine the amount of variance accounted for by the different predictors of success. Additionally, forward binary logistic

regressions were conducted for each of the treatment programs to determine if differences in predicted variance existed among the three programs (see Figure 4). Odds ratios were also calculated. We predicted that the odds ratio would be significant for activity level for these analyses.

C3: Success Defined as Improvement in Physical Functioning

It was hypothesized that individuals with a higher degree of baseline self-efficacy and lower levels of perceived physical dysfunction at baseline would be more likely to improve in physical functioning.

Dependent Variable

Physical functioning was measured using the physical therapy measures of number of laps walked in five minutes. Change scores were calculated (pre-treatment walking – post-treatment walking/pre-treatment walking) and participants were classified as either "successful" (increase of at least 20%) or "non-successful" (decrease in physical functioning or less than 20% increase).

Predictor Variables

Predictors of success investigated included the measures utilized in the previous two analyses.

Analyses

To address multicollinearity, a correlational analysis was run to identify highly correlated predictors, and only one was selected for use in the forward binary logistic regressions. A forward binary logistic regression analyzing all graduates, regardless of treatment program (see Figure 3), was conducted to determine the amount of variance accounted for by the different predictors of success. Additionally, forward binary logistic regressions were conducted for each of the treatment programs to determine if differences in predicted variance existed among the three programs (see Figure 4). Odds ratios were also calculated. We predicted that the odds ratio would be significant for self-efficacy and perceived physical dysfunction.

C4: Success Defined as Decrease in Perceived Pain Severity

It was hypothesized that individuals with lower levels of distress and higher levels of activity at baseline would be more likely to have a clinically significant decrease in perceived pain severity.

Dependent Variable

Pain severity was measured using obtained scores on the Pain Severity scale on the MPI short form (MPI Pain). Change scores were calculated (pre score-post score/pre score) and participants were classified as either "successful" (decrease of at least 20%) or "non-successful" (increase in reported pain severity or less than 20% decrease).

Predictor Variables

Predictors of success investigated included the measures utilized in the previous analyses.

Analyses

To address multicollinearity, a correlational analysis was run to identify highly correlated predictors, and only one was selected for use in the forward binary logistic regressions. A forward binary logistic regression analyzing all graduates, regardless of treatment program (see Figure 3), was conducted to determine the amount of variance accounted for by the different predictors of success. Additionally, forward binary logistic regressions were conducted for each of the treatment programs to determine if differences in predicted variance existed among the three programs (see Figure 4). Odds ratios were also calculated. We predicted that the odds ratio would be significant for affective distress and activity level for these analyses.

C5: Success Defined as Increase in Self-Efficacy

It was hypothesized that individuals who had lower levels of baseline affective distress would display greater increases in self-efficacy.

Dependent Variable

Self-efficacy was measured using the Control scale on the MPI short form (MPI Control). Change scores were calculated (pre score – post score/pre score) and

participants were classified as either "successful" (increase of at least 20%) or "non-successful" (decrease in self-efficacy or less than 20% increase).

Predictor Variables

Predictors of success investigated included the measures utilized in the previous four analyses.

Analyses

To address multicollinearity, a correlational analysis was run to identify highly correlated predictors, and only one was selected for use in the forward binary logistic regressions. A forward binary logistic regression analyzing all graduates, regardless of treatment program (see Figure 3), was conducted to determine the amount of variance accounted for by the different predictors of success. Additionally, forward binary logistic regressions were conducted for each of the treatment programs to determine if differences in predicted variance existed among the three programs (see Figure 4). Odds ratios were also calculated. We predicted that the odds ratio would be significant for affective distress in these analyses.

Additional Analyses

To fulfill the aims of the study, additional analyses were conducted to provide empirically-based, relevant information to clinicians to assist them in tailoring treatment. Although the original analyses of the study fulfilled the proposed aims, additional analyses help expand and clarify the originally proposed analyses. MCOP was excluded

from the additional analyses as it was considered to be more of a "hybrid" program and the sample size was relatively small.

Comparison of Rates of Success between COP and FIT

COP and FIT were compared utilizing chi-square analyses to examine difference between the two groups in rates of success. Success was defined as significant improvement in three or more of the five previously investigated areas of success.

Predictors of Success in Three Areas

Success was defined as being classified as "successful" in at least three of the five previous definitions of success. Analyses were conducted for the overall sample as well as COP and FIT. Independent samples t-tests were conducted to identify variables that differed significantly among successful and unsuccessful participants. Based on data from the independent samples t-test and data from correlational analyses, potential predictors were identified and entered into a forward binary logistic regression. Forward binary logistic regressions were conducted to examine predictors of success in three or more of the five areas. Predictor variables utilized included variables which were significant predictors of success in previous analyses.

Predictors of Success in All Five Areas

Success was defined as being classified as "successful" in all five previous definitions of success. Analyses were conducted for the overall sample as well as COP and FIT. Independent samples t-tests were conducted to identify variables that differed

significantly among successful and unsuccessful participants. Based on data from the

independent samples t-test and data from correlational analyses, potential predictors were

identified and entered into a forward binary logistic regression. Forward binary logistic

regressions were conducted to examine predictors of success in three or more of the five

areas. Predictor variables utilized included variables which were significant predictors of

success in previous analyses.

Analysis of New Definitions of Success

Success was redefined for BDI-II, walking, pain, and control to account for

individuals who began treatment in a clinically successful range; e.g., a BDI-II score in

the minimally depressed range. Therefore, significant improvement in BDI-II scores was

redefined as a 20% decrease in BDI-II scores from pre- to post-treatment *or* a BDI-II of

13 or lower (minimally depressed) at post-treatment. Success in walking was redefined

as a 20% increase in walking ability from pre- to post-treatment *or* ability to walk fifteen

or greater laps at post-treatment. In the area of pain severity, success was redefined as a

20% decrease in pain severity *or* a reported pain level of six or less at post-treatment. In

terms of reported control over pain, success was defined as a 20% increase in sense of

control *or* a post-treatment rating of 10 or greater on MPI Control. Utilizing these new

definitions of success, chi-square analyses were conducted to identify difference between

COP and FIT in success rates.

Identifying Relevant Pre-Treatment Variables and Appropriate Cut Scores

Chi-square analyses were conducted to identify relevant variables that clinicians could utilize in determining the most appropriate treatment intensity for patients. Specifically hours resting, MPI Pain, MPI Interference, MPI Distress, BDI-II, and standing performance were investigated. Furthermore, chi-square analyses were conducted to compare success rates between COP and FIT in order to potential cut-points for each of these variables. Variables of interest were selected based on differences among those who were successful and those who were not on pre-treatment scores, as well as the predictors from previous analyses.

CHAPTER FOUR
Results

DEMOGRAPHIC ANALYSES

Demographic Analyses for the Entire Sample

      Hypothesis A utilized the entire sample, regardless of graduation. Demographic

variables were examined for the overall sample, as well as for each treatment group

(Table 2). Both graduates and non-graduates were included in the analyses.

Comparisons were made among the three treatment programs on the demographic

variables of age, gender, marital status, race, insurance type, and chronicity of pain

(Table 3). Chi-square analyses were conducted on the variables of gender, marital status,

and insurance type.

      Findings revealed no significant differences among the three treatment groups

with regard to gender. Chi-Square analyses revealed that groups differed significantly on

race, χ^2 (8, $N=1062$) = 20.580, $p=.008$; marital status, χ^2 (8, $N=1062$) = 26.051, $p=.001$;

and insurance type, χ^2 (8, $N=1062$) = 101.659, $p<.001$ (Table 3). The racial composition

of the three programs differed in distribution of various ethnicities, with 15.2% of

participants in the COP group identifying themselves as African-American compared to

7.9% in the FIT group and 6.6% in the MCOP group. In addition, 79.0% of the COP

program participants were White, compared to 86.1% and 86.9% in the FIT and MCOP

groups, respectively.

      Analyses of variances (ANOVA) were conducted with age and chronicity of

pain. Significant differences existed among the three treatment levels with regard to age,

$F(2,1053) = 6.238$, $p=.002$. Post-hoc analyses evaluated the pairwise differences among the means. Tukey Honestly Significant Differences (HSD) post-hoc analyses revealed a significant difference between the mean ages of participants in FIT (M =52.15) and COP (M =49.13). The three groups did not differ significantly on chronicity of pain.

The demographic variables of race and insurance type were included in subsequent analyses as potential predictors of graduation as the differences among the groups appeared both statistically and clinically significant. Although age was statistically significant, it was determined to be less clinically relevant, as the largest difference in mean age, occurring between COP and FIT, was only three years. Thus, it was not included as a potential predictor as a means of controlling for these differences. Marital status was also found to be statistically significant, but was not included as a potential predictor of graduation, as fully examining interpersonal factors fell outside the scope of this project and an incomplete examination of interpersonal factors could interfere with the accurate interpretation of the primary research results. However, to insure that marital status was not ignored, investigational analyses were conducted utilizing marital status. As expected, marital status was not a significant predictor of graduation. Furthermore, our previous research did not find marital status as a predictor of graduation from COP.

Demographic Analyses for Graduates Only

Hypothesis C investigated samples of participants which included only graduates. Demographic variables were examined for graduates in each of the individual programs, as well as for the overall sample (Table 4). Comparisons were made among the three

programs on the demographic variables of age, gender, marital status, race, insurance type, and chronicity of pain (Table 5).

Chi-square analyses were conducted to evaluate differences in the variables of gender, marital status, and insurance type. No significant differences were found among the three treatment programs with regard to gender and marital status. Looking at distribution of marital status for the graduate sample in comparison to the overall sample, distributions in FIT and COP were relatively the same, differing by less than one percent in each of the categories. For MCOP, there were more married individuals and less divorced individuals than in the overall sample, but the difference was statistically non-significant.

The programs differed significantly on race, χ^2 (8, N=801) = 19.621, p=.012; and insurance type, χ^2 (8, N=801) = 83.245, p<.001. Table 5 shows that 13.8% of the participants in the COP group were African American, compared to 8.2% in FIT, and 4.5% in MCOP. Differences in insurance type were seen in percent of Worker's Compensation benefits and commercial insurance. In COP, 16.8% of participants were identified as having Worker's Compensation as their primary payer, compared to 4.1% in FIT and 0% in MCOP. MCOP had the highest proportion of participants with commercial insurance, with 77.3% of participants utilizing commercial insurance compared to 64.5% in FIT and 47.5% in COP.

Analyses of variances were conducted on the variables of age and chronicity of pain. The three groups were statistically different in terms of age, $F(2,792)=7.201$, p=.001. Follow-up tests were conducted to evaluate the pairwise differences among the means. Tukey HSD post hoc analyses revealed a significant difference between the mean

age of participants in the FIT (M=53.56) and COP (M=49.79) groups. The three groups did not differ significantly in chronicity of pain. The demographic variables of insurance and race were controlled for by including these variables as predictors in the proposed regressions. Although age was statistically significant, it was deemed to be clinically irrelevant, as the mean age in COP and FIT differed by less than four years.

PREDICTORS OF GRADUATION

Given the large number of analyses for each hypothesis, a summary paragraph is provided at the end of each hypothesis section to aid the reader.

Controlling for Type I Error

As the reader may recall, Type I errors occur when a finding is said to be significant, when in fact it is not; thus, the null hypothesis is rejected in error. To control for this type of error, the issue of multicollinearity necessitates attention when conducting regression analyses. Multicollinearity occurs in regression analyses when two or more predictor variables are highly correlated. If predictor variables are highly correlated, the ability to accurately determine the precise power of each individual predictor from the entire group of predictors is impaired. In order to identify highly correlated predictor variables, and thus address the issue of multicollinearity, Pearson correlations were conducted to examine the relationships among the proposed predictor variables. Variables with correlations greater than $r=0.30$ were examined and variables were kept based on the strength of their association with the criterion variable. As mentioned, the additional control of utilizing demographic variables (i.e. race and insurance type) as potential predictors minimized the probability of spurious outcomes.

Hypothesis A

Identifying Potential Predictor Variables of Graduation

It was hypothesized that higher levels of affective distress and greater health care utilization would be predictive of graduation in the overall sample. Independent samples t-tests were conducted to identify variables that were significantly different between graduates and non-graduates (Table 6). These analyses revealed significant differences in BAI scores, (graduate M =17.00, non-graduate M=20.42), $t(835) = 3.808$, $p<.001$. Significance was approached in pre-treatment walking performance, $t(835) = 1.707$, $p=.088$; and number of hours resting, $t(835) = -1.859$, $p=.072$. Based on correlational data and data obtained from the independent samples t tests, BDI-II, MPI Interference, MPI Distress, MPI Control, and standing were removed from subsequent analyses. Thus, BAI scores, hours resting, and walking performance were entered as potential predictors into the final forward binary logistic regression. Additionally, insurance type and race were selected due to the demographic analysis. Age, emergency room visits, mental health visits, physician visits, and diagnostic procedures were included as well, as they were not correlated with any other variable.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate the prediction of graduation in the overall sample. As hypothesized, the Wald ratios for both BAI and ER visits were statistically significant (Table 7), $\beta=-.022$, $\chi^2(1)=10.366$, $p=.001$; and $\beta=-.177$, $\chi^2(1)=27.159$, $p<.001$, respectively. Analysis revealed an odds ratio of .978 (CI .965 to .991) for the BAI and .838 (CI .784 to .896) for ER visits. This indicated that for each

one point increase in BAI scores, chances of not graduating for the overall sample

increased by 2%. Similarly, for each emergency room visit over the year prior to

treatment, the chance of not graduating increased by 19%. BAI and number of ER visits

over the twelve months prior to program entry were found to correctly classify 77.5% of

participants in any of the three treatment programs.

Hypothesis B

Comprehensive Outpatient Program

Identifying Potential Predictors

Independent samples t-tests identified variables that were significantly different

between graduates and non-graduates for each treatment program separately (Table 8).

For COP, these analyses revealed significant differences in BAI scores, $t(121.90) =$

2.768, $p=.007$; ER visits, $t(115.718) = 2.557$, $p=.012$; and mental health visits, $t(109.364)$

$= 2.059$, $p=.042$. Non-graduates displayed higher levels of mean BAI scores (M=21.63)

than graduates (M=17.76). Non-graduates also had a greater number of mean ER visits

(M=1.93) than graduates (M=1.17), and a greater number of mean mental health visits

(M=6.07) than graduates (M=3.53) over the twelve months prior to treatment entry.

Significance was approached in number of hours resting, $t(500)=1.283$, $p=.200$; MPI

Control, $t(129.900)=1.577$, $p=.007$; MPI Pain, $t(500)=1.435$, $p=.152$; and age, $t(500)=$-

1.769, $p=.077$. Based on correlational data and data obtained from the independent

samples t-tests, BDI-II, MPI Distress, MPI Interference, MPI Control, and standing

performance were removed from subsequent analyses. Thus, BAI scores, number of ER

and mental health visits, age, MPI Pain, walking performance, and age were selected as

potential predictors for the final forward binary logistic regression. Additionally,

insurance type and race were selected due to the demographic analysis.

Forward binary logistic regression

A forward binary logistic regression was conducted to evaluate the prediction of

graduation in COP. The Wald Ratios for both BAI and ER visits were statistically

significant (Table 9), β=-.031, $\chi^2(1)$=96.409, p=.001 and β=-.163, $\chi^2(1)$=14.671, $p<.001$,

respectively. Analysis revealed an odds ratio of .970 (CI .953 to .987) for the BAI and

.850 (CI .782 to .923) for ER visits. This indicated that for each one point increase in

BAI scores, chances of not graduating increased by 3%. Similarly, with each emergency

room visit over the year prior to treatment, the chances of not graduating increased by

17.6%. Pre-treatment BAI scores and number of ER visits over the twelve months prior

to program entry were found to correctly classify 78.6% of participants in COP.

Modified Comprehensive Outpatient Program

Identifying potential predictors

Independent samples t-tests comparing graduates and non-graduates in MCOP

(Table 8) revealed significant differences in number of hours resting $t(21.180)$=2.182,

p=.040; with non-graduates reporting more hours resting per day (M=6.06) than

graduates (M=4.27). Comparisons approached significance for number of ER visits over

the twelve months prior to treatment, $t(20.342)$=1.589, p=.128; MPI Interference,

$t(59)$=1.573, p=.121; and chronicity of pain $t(52.553)$=-1.639, p=.107. Based on

correlational data and data obtained from the independent samples t-tests, BAI, BDI-II,

number of diagnostic procedures and treatment procedures over the twelve months prior to treatment, walking performance, age, and MPI Distress were removed from subsequent analyses. Thus, number of hours resting, number of ER visits, chronicity of pain, and MPI Interference were included as potential predictors in the final forward binary logistic regression investigating predictors of graduation in MCOP. Additionally, insurance type and race were included due to the demographic analysis.

Forward binary logistic regression

For prediction of graduation from MCOP, forward binary logistic regression revealed that the Wald Ratio (Table 9) for hours resting was statistically significant, β=-.292, $\chi^2(1)$=5.426, p=.020. Analysis revealed an odds ratio of .747 (CI .584 to .955). This indicated that for each hour spent resting per day, the chances of not graduating increased by 33.9%. Number of hours resting was found to correctly classify 78.3% of MCOP participants.

Focused Interdisciplinary Treatment

Identifying potential predictors

Independent samples t-tests comparing graduates and non-graduates of FIT (Table 8) revealed significant differences in age, $t(299)$=-2.983, p=.003; ER visits, $t(82.575)$=3.265, p=.002; hours resting, $t(291)$=3.413, p=.001; and MPI distress, $t(293)$=3.227, p=.001. Non-graduates were found to be younger (M=48.38) than graduates (M=53.56), have visited the ER more times over the twelve months prior to treatment (non-graduates M=1.64; graduates M=0.59), and reported greater number of

hours resting (non-graduates M=5.12; graduates M=3.90). Additionally, non-graduates

had higher levels of reported distress on the MPI Distress scale (M=7.60) than graduates

(M=6.17). Based on correlational data and data obtained from the independent samples t-

tests, BAI scores, BDI-II scores, MPI Pain, MPI Interference, MPI Control, medical and

mental health visits, diagnostic and treatment procedures, surgeries, and walking and

standing performance were removed from subsequent analysis. Thus, age, ER visits,

hours resting, and MPI Distress were selected as potential predictors in the final forward

binary logistic regression. Additionally, insurance type and race were selected due to the

demographic analysis.

Forward binary logistic regression

A forward binary logistic regression was conducted to evaluate the prediction of

graduation in FIT. The Wald Ratios for ER visits, β=-.274, χ^2(1)=11.646, p=.001; hours

resting, β=-.130, χ^2(1)=6.115, p=.013; and MPI Distress, β=-.097, χ^2(1)=4.611, p=.032;

were statistically significant (see Table 9). Analysis revealed an odds ratio of .760 (CI

.649 to .890) for ER visits, .878 (CI .792 to .973) for hours resting, and .908 (CI .831 to

.992) for MPI distress. This indicated that for each emergency room visit over the twelve

months prior to treatment, the chances of not graduating increased by 31.6%. The

chances of not graduating increased by 13.9% for each hour spent resting during the day,

and by 10% for each one point increase on the MPI Distress scale. ER visits, hours

resting, and level of distress were found to correctly classify 76.6% of FIT participants.

Overall sample with treatment program as predictor

A final forward binary logistic regression was conducted with the overall sample utilizing ER visits, BAI scores, and program type to investigate the impact of treatment program type on graduation rates. The addition of treatment program type did not add significantly to the prediction of graduation. Additionally, a chi-square analysis comparing graduation rates among treatment programs was non-significant.

Summary of Hypothesis B

In Summary, analyses of Hypothesis B found greater number of ER visits in the twelve months prior to treatment and higher pre-treatment BAI to be predictive of terminating treatment prior to graduating from COP. For MCOP, reported number hours resting was predictive of graduation, with those failing to finish treatment reporting greater number of hours resting at treatment entry. For FIT, greater number of ER visits, greater number of hours resting, and higher levels on the MPI Distress scale were predictive of failure to graduate.

PREDICTORS OF SUCCESS

Given the large number of analyses for each hypothesis, a summary paragraph is provided at the end of each hypothesis section to aid the reader.

Controlling for Type I Error

As with prior analyses investigating predictors of graduation, multicollinearity was addressed in analyses examining predictors of success. Pearson correlations were conducted to examine the relationships among the proposed predictor variables. Variables with correlations greater than $r=0.30$ were examined and variables were kept based on these correlations, as well as the strength of their association with the criterion variable. As mentioned, the additional control of utilizing demographic variables (i.e. race and insurance type) as potential predictors minimized the probability of spurious outcomes.

Two separate binary logistic regressions were conducted on Hypotheses C2 through C5 to account for regression towards the mean and to balance the need to avoid criterion contamination, which occurs when a criterion variable overlaps with a variable utilized in assigning group membership. To control for regression towards the mean, the initial analyses utilized pre-treatment BDI-II, walking performance, MPI Pain, and MPI Control as predictor variables, and utilized percentage improvement in these variables as criterion variables (i.e., the measures of success). To control for criterion

contamination, a second set of analyses were conducted without the pre-treatment variables used as predictor variables.

Hypothesis C1: Predictors of Success as Self-Reported Improvement

It was hypothesized that individuals with a higher degree of baseline self-efficacy and lower levels of affective distress would be more likely to rate themselves as improved at treatment discharge. Independent samples t-tests were conducted to identify variables that were significantly different among graduates who successfully completed the program (S), as defined by self-reported improvement of "very much" or "much" improved, and those who were not successful (US). These analyses were run for the overall sample, as well as for each treatment program separately. Based on these findings, potential predictors were identified and entered into a forward binary logistic regression conducted to identify predictors of success.

Overall Sample

Identifying Potential Predictor Variables

For the overall sample independent samples t-tests (Table 10) revealed that those who rated themselves as improved differed significantly from those who did not rate themselves as improved on only one variable, the MPI Interference scale, $t(240.408) = -2.299$, $p=.022$; with US individuals having lower pre-treatment MPI Interference scores (M=9.36) than S individuals (M=9.93). Significance was approached in BDI-II, $t(561) = -1.634$, $p=.103$; BAI, $t(561)=-1.654$, $p=.099$; MPI Control, $t(561)=1.563$, $p=.119$; and walking, $t(456)=1.662$, $p=.097$. However, these variables were removed from subsequent

analysis based on their correlations with other variables and the strength of their

relationship with the criterion variable. MPI Interference, as well as insurance type and

race were entered in to the forward binary logistic regression; all other remaining

variables were excluded from the subsequent analysis of the overall sample.

Forward Binary Logistic Regression

A forward binary logistic regression investigating predictors of success in the

overall sample revealed that the Wald Ratio for Interference was statistically significant,

$\beta=.090$, $\chi^2(1)=5.980$, $p=.014$ (see Table 11). Analysis revealed an odds ratio of 1.095 (CI

1.018 to 1.177). This indicated that for each one point increase in MPI Interference, the

chance of rating oneself as not improved increased by 9.5%. This model, utilizing

interference, correctly classified 72.6% of graduates of the overall sample. Race and

insurance type were excluded by the statistical model.

Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the COP graduates, independent samples t-tests (Table 10) revealed

significant differences in age between those who rated themselves as improved and those

who did not, $t(314)=-2.023$, $p=.044$. S participants were older (M=51.81) than US

participants (M=48.12). Based on correlational data and data obtained from the

independent samples t-test, age was selected as a potential predictor. In addition, race

and insurance type were included in the forward binary logistic regression due to the

demographic analysis. All other variables were removed from the analysis of COP graduates.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of success in COP, as defined by self-reported improvement. The Wald Ratio for age was statistically significant β=.026, χ^2(1)=4.000, p=.045 (Table 11). Analysis revealed an odds ratio of 1.027 (CI 1.001 to 1.051). This indicated that for each increase in age by one year, chances of rating oneself as improved increased by 2.7%. The ability of the model to correctly classify COP graduates was no higher than chance. Race and insurance type were excluded by the statistical model.

Modified Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the MCOP graduates, independent samples t-tests revealed no significant differences between S and US participants. However, perceived physical health, t(39)=1.824, p=.076; standing performance, t(39)=1.660, p=.105; MPI Pain, t(39)=-1.474, p=.149; and MPI Interference, t(10.387)=-1.477, p=.169 approached significance (Table 10). Based on correlational data and data obtained from the independent samples t-test, perceived physical health, standing performance, MPI Pain, and MPI Interference were selected as potential predictors. In addition, race and insurance type were included in the forward binary logistic regression due to the demographic analysis. All other variables were removed from the analysis of MCOP graduates.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of success in MCOP, as defined by self-reported improvement. The Wald Ratio for MPI Interference was not statistically significant, β=.359, $\chi^2(1)$=3.505, *p*=.051 (Table 11). Analysis revealed an odds ratio of 1.431 (CI .983 to 2.083). The confidence interval for the odds ratio includes one, which indicates a high likelihood of making a type I error. These findings were not statistically significant.

Focused Interdisciplinary Treatment

Identifying Potential Predictor Variables

For the FIT graduates, independent samples t-tests (Table 10) revealed significant differences between those who rated themselves as improved and those who did not in hours resting per day, *t*(200)=2.205, *p*=.029; and MPI Pain, *t*(201)=2.535, *p*=.012 . US individuals reported greater number of hours resting (M=4.30) and lower levels of pain (M=8.10) at pre-treatment than S individuals (rest M=4.29; MPI Pain M=8.90). Differences in MPI Control, *t*(201)=-1.637, *p*=.103; and number of diagnostic procedures received over the twelve months prior to treatment, *t*(201)=-1.477, *p*=.143; approached significance. Based on correlational data and data obtained from the independent samples t-test, hours resting, MPI Pain, MPI Control, and diagnostic procedures were selected as potential predictors of success in FIT graduates. In addition, race and insurance type were included in the forward binary logistic regression due to the demographic analysis. All other variables were removed from the analysis of FIT graduates.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of success in FIT, as defined by self-reported improvement. The Wald Ratio for MPI Pain was statistically significant, β=-.144, $\chi^2(1)$=6.113, *p*=.013 (see Table 11). Analysis revealed an odds ratio of .866 (CI .773 to .971). This indicated that for each one point increase in reported pain, chances of rating oneself as improved increased by 15.5%. Reported pain was found to correctly classify 58.6% of FIT graduates.

Summary of Predictors of Success, Hypothesis C1

In summary, analyses of Hypothesis C1 revealed higher levels of interference from pain at pre-treatment to be predictive of chances of rating oneself as improved in the overall sample, as well as the MCOP group. For COP, age was a predictor of chances of rating oneself as improved, with those rating themselves as improved being older than those who did not. For FIT, greater reported pain severity at pre-treatment was predictive of rating oneself as improved.

Hypothesis C2: Predictors of Success as Decreased Depression

It was hypothesized that participants with higher levels of activity at baseline would be more likely to have a clinically significant decrease in self-reported depression scores, as defined by a 20% decrease in BDI-II scores. Analyses were run for the overall sample, as well as for each treatment program separately.

Overall Sample

    Identifying Potential Predictor Variables

       Independent samples t-tests (Table 12) revealed that, in the overall sample, successful (S) participants differed significantly from unsuccessful participants (US) on age, $t(760)=2.673$, $p=.008$; number of emergency room visits, $t(729)=-1.915$, $p=.041$; hours resting, $t(476.844)=-2.780$, $p=.004$; MPI Interference, $t(344.507)=-3.683$, $p<.001$; MPI Distress, $t(762)=-4.966$, $p<.001$; MPI Control, $t(761)=4.786$, $p<.001$; BDI-II, $t(764)=-10.601$, $p<.001$; BAI, $t(544.494)=-10.601$, $p<.001$; and perceived physical health $t(370.495)=-5.621$, $p<.001$. S participants were found to be younger (M=50.06) than US participants (M=52.68). Furthermore, compared to US participants, S participants reported a greater number of ER visits prior to treatment entry (S M=1.06; US M=.80), greater number of hours resting (S M=5.51; US M=4.85), greater interference from pain (S M=10.15; US M=9.39), greater distress (S M=7.60; US M=6.40), higher levels of depression (S M=23.47; US M=15.30), and higher levels of anxiety (S M=17.78; US M=13.67). In addition, S participants reported less control over their pain (S M=6.34; US M=7.30), and lower perceived physical health (S M=24.17; US M=26.10). Significance was approached in differences in number of surgical procedures, $t(747)=1.725$, $p=.085$. Based on correlational data and data from the independent t-tests, age, number of emergency room visits, hours resting, MPI Interference, MPI Distress, MPI Control, and BDI-II, along with insurance type and race were included in the forward binary logistic regression for the overall sample. All other variables were excluded the analysis.

Forward Binary Logistic Regression

A forward binary logistic regression revealed a statistically significant Wald Ratio in the overall sample for BDI-II, β=.092, $\chi^2(1)$=86.437, *p*<.001 (see Table 13). Analysis revealed an odds ratio of 1.096 (CI 1.075 to 1.117). These results indicated that for each one point increase in BDI-II scores at treatment onset, the chance of successfully decreasing depression increased by 9.6%. Utilizing BDI-II, this model correctly classified 76.6% of participants in the overall sample.

Forward Binary Logistic Regression without Initial BDI-II

Given that BDI-II was the measure utilized to define success, it was deemed prudent to rerun the forward binary logistic regression without pre-treatment BDI-II entered as a potential predictor of decreased depression in the overall sample. The Wald Ratio for MPI Distress was statistically significant in this secondary model, β=.123, $\chi^2(1)$=23.302, *p*<.001 (see Table 13). Analysis revealed an odds ratio of 1.131 (CI 1.076 to 1.189). These results indicated that for each one point decrease in MPI Distress score, the chance of not showing improvement on the BDI-II increased by 13%. This model, utilizing MPI Distress, correctly classified 70.2% of participants in the overall sample.

Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the COP graduates, independent samples t-tests (Table 12) revealed statistically significant differences between S and US participants in BDI-II scores, *t*(519)=-6.779, *p*<.001; MPI Distress, *t*(517)=-2.877, *p*=.004; MPI Control, *t*(516)=2.570,

p=.010; and BAI, *t*(259.351)=-3.526, *p*<.001. S participants reported higher levels of

depression (M=24.35) than US individuals (M=17.51), greater distress (S M=7.86; US

M=6.99), lower control (S M=6.06; US M=6.71), and higher levels of anxiety (S

M=18.61; US M=15.30). Significance was approached in number of surgeries,

t(505)=1.917, *p*=.056; and hours resting, *t*(513)=-1.864, *p*=.063. Based on the

correlational data and the data obtained from the independent samples t-test, the BDI-II,

number of surgeries, and number of hours resting were selected as a potential predictor.

Race and insurance type were included in the forward binary logistic regression due to

the demographic analysis. In addition, number of sit to stand repetitions was also

included, as it was a significant predictor in a preliminary forward binary logistic

regression with all variables included. All other variables were removed from the

analysis of COP graduates.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of

success in COP, as defined by a 20% decrease in BDI-II scores. The Wald Ratios for

BDI-II β=.077, χ^2(1)=39.631, *p*<.001; and standing performance, β=.040, χ^2(1)=5.250,

p=.022, were statistically significant (Table 13). Analysis revealed an odds ratio of 1.081

(CI 1.055 to 1.107) for BDI-II and 1.041 (CI 1.006 to 1.077) for standing performance.

These results indicated that for each one point increase in BDI-II scores at treatment

onset, chances of improving on post-treatment BDI-II scores increased by 8%; and with

every one repetition increase in sit to stand, chances of improving decreased by 4%.

Utilizing BDI-II and standing performance, the model was able to correctly classify

77.7% of COP graduates.

Forward Binary Logistic Regression without Initial BDI-II

As was done with the larger sample, a secondary forward binary logistic

regression was conducted without BDI-II entered as a potential predictor of success in

COP. Due to its high correlation with the BDI-II, BAI was selected to be included in this

secondary analysis, along with standing performance and number of surgeries. The Wald

Ratio for BAI was statistically significant in this secondary model, $\beta=.032$, $\chi^2(1)=8.445$,

$p<=004$ (see Table 13); standing performance and surgeries was excluded from the

statistical model. Analysis revealed an odds ratio for BAI of 1.032 (CI 1.010 to 1.055).

These results indicated that for each one point decrease in initial BAI scores, the chance

of not improving on post-treatment BDI-II scores increased by 3%. This model, utilizing

BAI scores and excluding pre-treatment BDI-II, correctly classified 75.0% of COP

participants; this classification ability did not exceed the classification ability of the

constant (i.e., the model was no better than chance).

Modified Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the MCOP graduates, independent samples t-tests (Table 12) revealed

statistically significant differences between those who improved and those who did not in

number of emergency room visits, $t(39.888)=-1.895$, $p=.065$; BDI-II, $t(41)=-2.688$,

$p=.010$; standing performance, $t(41)=2.056$, $p=.046$; and perceived physical health

$t(41)=2.320$, $p=.025$. Compared to US participants, S participants reported a greater

number of ER visits in the twelve months prior to treatment (S M=1.37; US M=.38), and

higher levels of depression (S M=23.90; US M=14.54). Furthermore, S participants

reported lower perceived physical health (S M=21.80; US M=25.62), and demonstrated

lower endurance in the standing measure (M=12.67) at pre-treatment than US participants

(M=15.38). Significance was approached in hours resting, $t(41)=1.658$, $p=.105$; and BAI

scores $t(41)=-1.956$, $p=.057$. Based on correlational data and data obtained from the

independent samples t-test, BDI-II, number of emergency room visits, standing scores,

and hours resting were selected as potential predictors. Number of physician visits was

also included, as it was a significant predictor in a preliminary forward binary logistic

regression ran with all variables included. In addition, race and insurance type were

included in the forward binary logistic regression due to the demographic analysis. All

other variables were removed from subsequent analyses of MCOP graduates.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of

success in MCOP, as defined by 20% decrease in BDI-II scores. The Wald Ratios for

physician visits, $\beta=-.110$, $\chi^2(1)=4.847$, $p=.028$; BDI-II $\beta=.184$, $\chi^2(1)=6.586$, $p=.010$; and

standing performance, $\beta=-.437$, $\chi^2(1)=7.705$, $p=.006$; were statistically significant (see

Table 13). Analysis revealed an odds ratio of .896 (CI .813 to .988) for physician visits,

1.202 (CI 1.044 to 1.383) for BDI-II, and .646 (CI .474 to .879) for standing

performance. These results indicated that for each visit to a physician in the one year

prior to treatment entry, chances of not improving for MCOP graduates increased by

11.6%; with every one point decrease in initial BDI-II scores the chances of improving decreased by 20.2%; and with every one repetition increase in sit to stand ability prior to treatment, chances of not improving increased by 54.7%. The ability of the model to correctly classify MCOP graduates was 82.9%.

Forward Binary Logistic Regression without Initial BDI-II

As with previous samples in this hypothesis, it was deemed prudent to rerun the forward binary logistic regression without BDI-II entered as a potential predictor of success in MCOP, instead utilizing BAI scores. The Wald Ratio for standing performance, β=-.194, $\chi^2(1)$=4.360, p=037, remained statistically significant in this secondary model (see Table 13). Analysis revealed an odds ratio of .756 (CI .687 to .988) for standing performance. These results indicated that an increase of one repetition of sitting to standing, the chance of not improving on post-treatment BDI-II scores increased by 32% for MCOP graduates. Utilizing only standing performance s, this model correctly classified 68.3% of MCOP graduates; this classification ability did not exceed the classification ability of the constant (i.e., the model was no better than chance). BAI scores and physician visits were excluded from the statistical model.

Focused Interdisciplinary Treatment

Identifying Potential Predictor Variables

For the FIT graduates, independent samples t-tests (Table 12), revealed statistically significant differences between those who improved and those who did not in BDI-II, $t(96)$=-4.214, p<.001; and diagnostic procedures, $t(76.575)$=2.253, p=.027.

Compared to US participants, S participants reported higher pre-treatment levels of depression (S M=19.87; US M=12.61) and few diagnostic procedures performed in the twelve months prior to treatment entry (S M= 1.68; US M=2.55). Significance was approached in hours resting, $t(41)=1.658$, $p=.105$; MPI Distress, $t(96)=-1.465$, $p=.146$; MPI Control, $t(96)=1.465$, $p=.146$; and BAI scores, $t(41)=-1.956$, $p=.057$. Based on correlational data and data obtained from the independent samples t-test, BDI-II, and diagnostic procedures were selected as potential predictors for FIT graduates. In addition, race and insurance type were included in the forward binary logistic regression due to the demographic analysis. All other variables were removed from subsequent analyses for FIT graduates.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of success in FIT, as defined by 20% decrease in BDI-II scores. The Wald Ratios for diagnostic procedures $\beta=-.420$, $\chi^2(1)=8.107$, $p=.004$; and BDI-II, $\beta=.122$, $\chi^2(1)=15.482$, $p<.001$; were statistically significant (see Table 13). Analysis revealed an odds ratio of .657 (CI .492 to .877) for diagnostic procedures, and 1.130 (CI 1.068 to 1.201) for BDI-II. These findings indicated that for each diagnostic procedure received in the one year prior to treatment entry, chances of not improving on post-treatment BDI-II scores increased by 52.2%; and with every one point decrease in BDI-II score at treatment onset chances of improving decreased by 13%. The ability of the model to correctly classify FIT graduates was 73.2%.

Forward Binary Logistic Regression without Initial BDI-II

As before, it was deemed prudent to rerun the forward binary logistic regression without BDI-II entered as a potential predictor of success in FIT. Number of diagnostic procedures in the twelve months prior to treatment along with MPI Distress scores in one instance and BAI in another were utilized instead. Neither MPI Distress nor BAI were included in the statistical models. The Wald Ratio for diagnostic procedures, β=-.266, $\chi^2(1)$=4.829, p=.028, remained statistically significant in this secondary model (see Table 13). Analysis revealed an odds ratio of .767 (CI .605 to .972) for diagnostic procedures. This indicated that for each diagnostic procedure performed in the year prior to treatment entry, the chance of not improving on post-treatment BDI-II scores increased by 30%. This model, utilizing diagnostic procedures and excluding initial BDI-II scores, correctly classified 60.8% of FIT graduates.

Summary of Predictors of Success, Hypothesis C2

In summary, analyses of Hypothesis C2 revealed various predictors of success, as defined by a 20% or more reduction in BDI-II scores (see Table 13). Pre-treatment BDI-II scores was a stable predictor across all of the programs. For the overall sample, higher pre-treatment BDI-II scores were predictive of success. When BDI-II was removed from the analyses, higher scores on the MPI Distress scale was a significant predictor. For the COP sample, higher levels of depression and fewer sit to stand repetitions at pre-treatment were predictive of success. When pre-treatment BDI-II was removed as a potential predictor, higher scores on the BAI at pre-treatment, but not standing performance was a significant predictor of success. For the MCOP sample, fewer physician visits in the twelve months prior to treatment, higher levels of reported

depression (BDI-II), and fewer sit to stand repetitions were predictive of success. When BDI-II was removed from the analysis, standing performance continued to be a significant predictor. For the FIT program, greater number of diagnostic procedures prior to treatment and higher pre-treatment BDI-II scores were predictive of success. When BDI-II was removed, greater number of diagnostic procedures continued to predict success.

Comparisons of Successful and Unsuccessful Participants on Pre- and Post-Treatment BDI-II

Due to the limited variance accounted for by the models, comparisons of S and US participants on pre- and post-treatment BDI-II scores were conducted.

Overall Sample

For the overall sample, independent samples t-tests revealed that the two groups differed significantly at pre-treatment, t(764)=-10.601, *p*<.001. S participants reported higher levels of pre-treatment BDI-II scores (M=23.47) than US participants (M=15.30). Independent samples t-tests revealed that, at post-treatment, the two groups differed significantly as well, *t*(332.109)=7.108, *p*<.001. The mean BDI-II score at post-treatment was 9.67 for S participants and 15.39 US participants.

Comprehensive Outpatient Program

Looking solely at COP participants, independent samples t-tests revealed that the S and US participants differed significantly at pre-treatment, $t(519)=-6.779$, $p<.001$; with S participants having higher initial BDI-II scores (M=24.35) than US participants (M=17.51). The two groups differed significantly at post-treatment as well, $t(165.548)=7.611$, $p<.001$; with S participants reporting lower levels of depression (M=9.49) than US participants (M=17.90).

Modified Comprehensive Outpatient Program

Independent samples t-tests were conducted to evaluate differences in BDI-II scores among S and US participants in MCOP. Analysis of pre-treatment scores revealed that the two groups differed significantly, $t(41)=-2.688$, $p=.010$, with S participants reporting higher pre-treatment BDI-II scores (M=23.90) than US participants (M=14.54). The two groups did not differ significantly in post-treatment BDI-II scores, $t(41)=1.496$, $p=.142$; with S participants reporting slightly, but not significantly lower, BDI-II scores (M=9.20) than US participants (M=12.92).

Focused Interdisciplinary Treatment

For FIT, independent samples t-tests comparing S and US participants' pre-treatment BDI-II scores revealed significant difference among the two groups, $t(200)=-6.547$, $p<.001$. S participants reported higher BDI-II scores (M=20.23) at pre-treatment than US participants (M=12.27). Differences among the two groups in post-treatment BDI-II scores were not significant, $t(200)=1.406$, $p=.161$; with S participants having similar mean post-treatment BDI-II scores (M=10.43) than US participants (M=14.54).

Comparison of Treatment Programs on Pre- and Post-treatment BDI-II

A repeated measures analysis of covariance (ANCOVA) examined changes in BDI-II scores across time among different treatment groups while controlling for initial BDI-II ratings. Differences between pre- and post-treatment scores were not significant, $F(1,762)=.940$, $p=.333$. However, a significant interaction existed between pre-treatment BDI-II scores and changes across time, $F(1,762)=316.560$, $p<.001$. Furthermore, a significant interaction between change across time and treatment program was found, $F(2,762)=9.227$, $p<.001$. Pairwise comparisons revealed significant differences in estimated marginal means between COP ($M=.714$) and FIT ($M=2.086$; $p<.001$); and MCOP ($M=.499$) and FIT ($p=.014$).

Hypothesis C3: Predictors of Success as Increase in Walking Ability

It was hypothesized that individuals with a higher degree of baseline self-efficacy and lower levels of perceived physical dysfunction at baseline would be more likely to improve in physical functioning, as measured by a 20% increase in laps walked in five minutes. Analyses were run for the overall sample, as well as for each treatment program separately.

Overall Sample

    Identifying Potential Predictor Variables

For the overall sample, independent samples t-tests (Table 14) revealed that those who were successful, as defined by increased physical ability, differed significantly from those who were classified as unsuccessful at pre-treatment in number of hours resting, $t(655)=-3.165$, $p<.001$; MPI Pain, $t(663)=-3.200$, $p=.001$; MPI Interference, $t(282.393)=-4.709$, $p<.001$; BDI-II scores, $t(401.472)=-4,020$, $p<.001$; BAI, $t(661)=-2.351$, $p=.019$; perceived physical health, $t(658)=4.630$, $p<.001$; walking performance, $t(667)=10.854$, $p<.001$; and standing performance, $t(667)=8.124$, $p<.001$. S participants reported greater number of hours resting (M=5.81) than US participants (M=4.89), higher levels of pain (S M=8.84; US M=8.30), greater interference from pain (S M=10.39; US M=9.38), higher levels of depression (S M=22.54; US M=19.19), and greater anxiety (S M=17.65; US M=15.54). Furthermore, S participants reported lower perceived physical health (S M=23.62; US M=25.86), and demonstrated lower walking ability (S M=13.99; US M=18.85) and standing ability (S M=13.44; US M=17.99) at pre-treatment. Based on correlational analyses, data obtained from the independent samples t-tests, and the strength of the individual variables' association with the criterion variable, hours resting, BDI-II, and walking performance were entered as potential predictors into the forward binary logistic regression. In addition, insurance type and race were included due to the demographic analyses. All other variables were excluded from the analysis.

Forward Binary Logistic Regression

A forward binary logistic regression investigating predictors of success in the overall sample revealed significant Wald Ratios for BDI-II, β=.031, $\chi^2(1)$=10.494, p=.001; and walking performance, β=-.182, $\chi^2(1)$=81.430, p<.001 (see Table 15). Analysis revealed an odds ratio of 1.031 (CI 1.012 to 1.051) for BDI-II and .834 (CI .802 to .868) for walking performance. These results indicated that for each one point decrease in BDI-II scores at treatment onset, the chance of not improving from treatment increased physical functioing by 3.1%; and for each lap walked chances of not improving increased by 19.9%. Utilizing BDI-II and walking performance, this model correctly classified 75.3% of graduates in the overall sample.

Forward Binary Logistic Regression without Initial Walking Ability

Pre-treatment walking performance was utilized in calculating change scores, and consequently for classifying participants as either successful or unsuccessful. Thus, it was deemed prudent to rerun the forward binary logistic regression without initial walking performance entered as a potential predictor for the overall sample. Based on correlational data and the association with the criterion variable, MPI Interference and standing performance were entered as potential predictors. The Wald Ratio for standing performance, β=-.094, $\chi^2(1)$=44.469, p<.001; and MPI Interference, β=.150, $\chi^2(1)$=14.988, p<.001; were statistically significant in this secondary model (see Table 15). Analysis revealed an odds ratio of .910 (CI .885 to .936) for standing performance, and 1.161 (CI 1.077 to 1.253) for MPI Interference. These results indicated that for every increase of one repetition of sit to stand, chances of not improving increased by 9.8%;

and with each one point increase in MPI Interference scores, chances of being unsuccessful at improving physical functioning increased by 16%. Utilizing standing performance and MPI Interference scores, this model correctly classified 72.9% of graduates from the overall sample. Standing was less predictive than walking.

Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the COP graduates, independent samples t-tests (see Table 14) revealed statistically significant differences between S and US participants in MPI Pain, $t(517)=-2.585$, $p=.010$; MPI Interference, $t(151.755)=-2.600$, $p=.010$; BDI-II scores, $t(516)=-2.502$, $p=.013$; perceived physical health, $t(512)=2.724$, $p=.007$; walking performance, $t(521)=9.978$, $p<.001$; and standing performance, $t(521)=6.904$, $p<.001$. Compared to US participants at pre-treatment, S participants reported greater pain (S M=8.97; US M=8.47), greater interference (S M=10.52; US M=9.87), and greater depression, (S M=23.24; US M=20.50). In addition, S participants reported lower perceived physical health (S M=23.35; US M=24.84), and demonstrated lower walking abilities (S M=13.95; US M=19.46) and lower standing ability (S M=13.32; US M=18.02). Significance was approached in the differences in age $t(516)=-1.761$, $p=.079$; and BAI, $t(517)=-1.701$, $p=.090$. Based on the strength of the variables' association with the criterion variable, correlational data, and the data obtained from the independent samples t-test, BDI-II, perceived physical health, walking performance, and age were selected as a potential predictor. In addition, race and insurance type were included in the forward binary

logistic regression due to the demographic analysis. All other variables were removed from subsequent analyses.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of success, as defined by 20% increase in numbers of laps walked at post-treatment. The Wald Ratios for BDI-II β=.024, χ^2(1)=4.022, p=.045; and walking performance, β=-.203, χ^2(1)=65.506, p<.001; were statistically significant (see Table 15). Analysis revealed an odds ratio of 1.024 (CI 1.001 to 1.049) for BDI-II and .816 (CI .777 to .858) for walking performance. These results indicated that for each one point decrease in BDI-II scores at treatment onset, chances of not improving in physical functioning increased by 2.4%; and with every one lap increase in walking, chances of not improving increased by 22.5%. Utilizing BDI—II and walking performance, the model correctly classified 78.6% of COP graduates.

Forward Binary Logistic Regression without Initial Walking Ability

As with before, it was deemed prudent to rerun the forward binary logistic regression without pre-treatment walking performance entered as a potential predictor for COP. Based on the strength of associations with the criterion variable and correlational data, standing performance, MPI Pain, and BDI-II were selected to be included as potential predictors. The Wald Ratio for standing performance was statistically significant in this secondary model, β=-.099, χ^2(1)=37.877, p<001 (see Table 15). Analysis revealed an odds ratio of .906 (CI .878 to .935). These results indicated that for

each increase of one in number of sit to stand repetitions at pre-treatment, the chance of

not improving in physical functioning increased by 10.3%. This model, utilizing

standing performance, correctly classified 78.2% of COP graduates; this classification

ability did not exceed the classification ability of the constant (i.e., the model was no

better than chance).

Modified Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the MCOP graduates, independent samples t-tests (see Table 14) revealed

differences that approached statistical significance between S and US participants in

chronicity of pain, $t(39)=1.983$, $p=.054$; MPI Interference, $t(39)=-1.856$, $p=.071$; and

walking performance, $t(39)=1.556$, $p=.128$. Based on the strength of the individual

variables' relationship with the criterion variable, correlational data, and data obtained

from the independent samples t-test, chronicity of pain, MPI Interference, and walking

performance were selected as a potential predictor. In addition, race and insurance type

were included in the forward binary logistic regression due to the demographic analysis.

All other variables were removed from subsequent analyses.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of

success among graduates of MCOP. All variables were excluded from the statistical

model (see Table 15). Thus, no predictor of success, as measured by 20% increase in

walking ability, was identified for the MCOP program.

Forward Binary Logistic Regression without Initial Walking Ability

A second forward binary logistic regression was conducted to evaluate predictors of success among graduates of MCOP, excluding initial walking scores. All variables were excluded from the statistical model (see Table 15). Thus, no predictor of success, as measured by 20% increase in walking ability, was identified for the MCOP program.

Focused Interdisciplinary Treatment

Identifying Potential Predictor Variables

For the FIT graduates, independent samples t-tests (see Table 14) revealed statistically significant differences between S and US participants in walking performance, $t(103)=3.362$, $p=.001$; and standing performance, $t(103)=2.418$, $p=.001$. S participants demonstrated lower walking (M=14.81) and standing (M=14.93) abilities than US participants (walk M=18.31; stand M=18.55). Significance was approached in hours resting, $t(102)=-1.607$, $p=.111$. Based on the association with the criterion variable, correlational data, independent samples t-test data, and the demographic analysis, walking performance, hours resting, race, and insurance type were entered into the forward binary logistic regression as potential predictors. All other variables were removed from subsequent analyses.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of success, as defined by 20% increase in walking performance in FIT. The Wald Ratio for walking performance, $\beta=-.127$, $\chi^2(1)=9.452$, $p=.002$; was statistically significant (see

Table 15). Analysis revealed an odds ratio of .881 (CI .812 to .955). These results indicated that for each one lap increase in initial walking ability, chances of not improving in physical functioning increased by 13.5%. This model was able to correctly classify 63.8% of FIT graduates.

Forward Binary Logistic Regression without Initial Walking Ability

It was again deemed prudent to conduct a forward binary logistic regression without initial walking ability entered as a potential predictor, instead utilizing standing performance in the FIT sample. The Wald Ratio for standing performance was significant, β=-.077, $\chi^2(1)$=5.192, p=.023 (see Table 15). Analysis revealed an odds ratio of .926 (CI .867 to .989). These results indicated that for each increase of one repetition of sit to stand at treatment initiation, the chance of not improving physical functioning increased by 7.9%. Utilizing standing performance, this model correctly classified 64.8% of FIT graduates.

Comparisons of Successful and Unsuccessful Participants on Pre- and Post-Treatment Walking Ability

After evaluating each of the models' ability to correctly classify participants, and only identifying low levels of physical ability as a continuous predictor of success, comparisons of S and US participants were conducted on pre- and post-treatment walking abilities.

Overall Sample

For the overall sample, independent samples t-tests revealed that the two groups differed significantly in pre-treatment walking ability, t(667)=10.854, *p*<.001. The mean walking scores at pre-treatment was 13.99 for S participants and 18.85 for US participants. Independent samples t-tests revealed that, at post-treatment, the two groups differed significantly as well, *t*(667)=7.151, *p*=.001. The mean walking score at post-treatment was 21.68 for S participants and 19.94 for US participants.

Comprehensive Outpatient Program

Looking at just COP participants, independent samples t-tests revealed that S and US participants differed significantly at pre-treatment, *t*(521)=9.978, *p*<.001, with S participants displaying lower initial walking ability (M=13.95) than US participants (M=19.46). At post-treatment no statistically significant differences were found between the two groups, *t*(521)=-1.744, *p*=.082; with S participants (M=22.02) displayed similar walking abilities at post treatment compared to US participants (20.85).

Modified Comprehensive Outpatient Program

Independent samples t-tests were conducted to evaluate differences in walking ability between S and US participants in the MCOP program. S participants displayed lower walking abilities (M=13.34) than US participants (M=15.83) at pre-treatment; however, analysis revealed that the two groups did not differ significantly, *t*(39)=1.556, *p*=.128. In addition, the two groups did not differ significantly in post-treatment walking

performance, *t*(39)=-1.766, *p*=.085; with S participants (M=19.72) and US participants (M=16.42) displaying similar walking abilities.

Focused Interdisciplinary Treatment

For the FIT program, independent samples t-tests comparing S and US participants' pre-treatment walking scores revealed significant difference between the two groups, *t*(103)=3.362, *p*=.001. S participants displayed lower level of initial physical abilities (M=14.81) than US participants (M=18.31). Differences between the two groups in post-treatment walking performance were not significant, *t*(103)=-.717, *p*=.475; with S participants walking an average of 19.79 laps and US participants walking an average of 18.92 laps.

Rethinking Definitions of Success for Walking Performance

For each of the samples, S and US participants differed significantly at pre-treatment. However, only the overall sample showed significant differences between the two groups at post treatment. Despite this significant difference, it has little clinical utility, as the two groups differed by less than one lap walked. Discussion with the physical therapist regarding clinical thoughts about success in the domain of walking revealed that the majority of individuals, barring serious gait issues, should be able to achieve 18 or greater laps. Furthermore, goals set in treatment regarding walking performance are set as a minimum improvement of three laps. Thus, individuals are judged to be "successful" in this domain if their walking ability increases over treatment by at least three laps. Success was then computed with individuals were classified as

"successful" if their walking ability from pre- to post-treatment improved by three laps.

Independent samples t-tests revealed that those who were classified as "successful" using

this criterion differed significantly from those classified as "unsuccessful" at post-

treatment, $t(667)=-7.035$, $p<.001$. However, comparisons of post-treatment walking

performance means revealed that those who were unsuccessful walked an average of

18.16 laps, and those who were successful walked an average of 22.11 laps.   As the

mean post-treatment walking scores were still an acceptable range for those considered

"unsuccessful," no further analyses were conducted utilizing this definition of success.

Based on post-treatment comparisons of walking performance among

"successful" and "unsuccessful," a different criterion for measuring successful

improvement in physical performance was formulated. With both groups combined, the

mean post-treatment walking score was 21.19, with a standard deviation of 6.359. Thus,

"unsuccessful" was considered one standard deviation below the mean, or 14.831. As

laps walked are recorded in whole numbers, the most appropriate cut-off was determined

to be 15; with those classified as "successful" walking 15 or more laps and those

considered "unsuccessful" walking 14 or fewer laps.

Overall Sample Utilizing Revised Definition of Success

Identifying Potential Predictor Variables

For the overall sample, independent samples t-tests (see Table 16) revealed

significant differences between S and US participants in age, $t(662)=4.981$, $p<.001$;

number of visits to a mental health professional over the 12 months prior to treatment,

$t(195.743)=-3.019$, $p=.003$; walking performance, $t(164.403)=-21.026$, $p<.001$; and

standing performance, $t(156.288)=-9.007$, $p<.001$. S participants were younger (M=49.46) than US participants (M=56.31), reported more mental health visits in the twelve months prior to treatment (S M=3.70; US M=2.12), and demonstrated higher initial physical abilities in the areas of walking (S M=16.51; US M=15.42) and standing (S M=15.42; US M=10.20). Significance was approached in hours resting, $t(655)=1.641$, $p=.101$, BAI, $t(661)=1.407$, $p=.160$, and perceived physical health, $t(658)=-1.387$, $p=.166$. Correlational analysis revealed significant correlations between BAI and perceived physical health ($r=-.357$), and walking and standing performances ($r=.630$). Based on the results of the independent samples t-tests, perceived physical health was excluded from subsequent analyses. It was decided to utilize walking performance and standing performance in two separate analyses. Thus, the first forward binary logistic regression included age, mental health visits, walking performance, hours resting, and BAI, as well as financial class and race. The second forward binary logistic regression utilized these same variables, except for walking performance, which was replaced with standing performance.

Forward Binary Logistic Regression

For the overall sample, Wald Ratios for the first regression analysis were significant for age, $\beta=-.037$, $\chi^2(1)=8.720$, $p=.003$; and walking performance, $\beta=.435$, $\chi^2(1)=99.543$, $p<001$ (see Table 17). The odds ratio for age was .963 (CI .940 to .988), and 1.545 (CI 1.418 to 1.683) for walking performance. Therefore, for every one year increase in age, chances of being "unsuccessful," as defined by walking less than 15 laps at post-treatment increased by 3.8%; and for every one lap walked at pre-treatment,

chances of being "successful" increased by 54.5%. Utilizing age and walking ability, this model correctly classified 89.6% of graduates in the overall sample.

Forward Binary Logistic Regression without Initial Walking Ability

For the overall sample, a forward binary logistic regression was conducted secondarily without walking performance, instead entering standing performance as a potential predictor. This analysis revealed significant Wald Ratios for age, β=-.051, $\chi^2(1)$=21.544, p<.001; and standing, β=.181, $\chi^2(1)$=40.953, p<.001 (see Table 17). The odds ratio for age was .950 (CI .930 to .951), and 1.199 (CI 1.134 to 1.267) for standing performance. These results indicated that for every one year increase in age, chances of walking less than 15 laps at post-treatment increased by 5.2%, and with every one sit to stand repetition at pre-treatment, chances of walking 15 or more laps at post-treatment increased by 19.9%. Utilizing age and standing performance, this model correctly classified 87.2% of graduates in the overall sample.

Comprehensive Outpatient Program Utilizing Revised Definition of Success

Identifying Potential Predictor Variables

For the COP samples, independent samples t-tests (see Table 16) revealed significant differences between S and US participants in age, $t(516)$=3.418, p=.001; number of visits to a mental health professional over the 12 months prior to treatment, $t(119.595)$=-2.162, p=.033; walking performance, $t(107.492)$=-17.179, p<.001; and standing performance, $t(95.082)$=-7.920, p<.001. S participants were younger (M=49.11) than US participants (M=54.66), reported a greater number of mental health visits prior to

treatment (S M=3.62; US M=2.28), and demonstrated greater physical ability in both walking (S M=16.13; US M=7.89) and standing (S M=14.98; US M=9.59). Significance was approached in number of diagnostic procedures in the twelve months prior to treatment, $t(506)$=-1.354, p=.176; number of treatment procedures in the twelve months prior to treatment, $t(500)$=-1.313, p=.190; hours resting, $t(510)$=1.841, p=.066; BAI, $t(515)$=1.515, p=.130; and perceived physical health, $t(512)$=-1.336, p=.182. Correlational analysis revealed significant correlations between walking and standing performance (r=.635), and BAI and perceived physical health (r=-.310). Based on the results of the independent samples t-tests, correlational data, and the strength of the relationship with the criterion variable, age, mental health visits, walking performance, hours resting, and BAI, as well as insurance type and race were included as potential predictors.

Forward Binary Logistic Regression

For the COP sample, a forward binary logistic regression revealed significant Wald Ratios for walking performance, β=.418, $\chi^2(1)$=70.782, p<001 (see Table 17). The odds ratio for walking was 1.518 (CI 1.377 to 1.673) for walking. These results indicated that for every one lap walked at pre-treatment, chances of walking 15 or more laps at post-treatment increased by 51.8%. This model correctly classified 90.0% of COP graduates.

Forward Binary Logistic Regression without Initial Walking Ability

To keep with previous methods of analyses, pre-treatment standing was used in place of pre-treatment walking ability as a potential predictor of success in COP. As a result, a second binary logistic regression was conducted utilizing the same variables as before, with the substitution of standing performance for walking performance. The forward binary logistic regression revealed significant Wald Ratios for age, $\beta=-.038$, $\chi^2(1)=6.566$, $p=.010$; and standing performance, $\beta=.242$, $\chi^2(1)=36.671$, $p<001$ (see Table 17). The odds ratio for age was .963 (CI .936 to .991), and 1.273 (CI 1.178 to 1.377) for standing. These results indicated that for every one year increase in age, chances of being "unsuccessful," as defined by walking less than 15 laps at post-treatment increased by 3.8%; and for every one repetition of sitting to standing in one minute at pre-treatment, chances of being "successful" increased by 27.3%. Utilizing age and standing performance, this model correctly classified 89.6% of COP graduates. The predictive ability of standing performance was much lower than that of walking performance.

Modified Comprehensive Outpatient Program Utilizing Revised Definition of Success

   Identifying Potential Predictor Variables

For the MCOP sample, independent samples t-tests (see Table 16) revealed significant differences between S and US participants in walking performance, $t(39)=-7.502$, $p<.001$. S participants had higher initial walking performance (M=15.71) than US participants (M=6.14). Significance was approached MPI Interference, $t(32.419)=1.582$, $p=.138$; and standing performance, $t(39)=-1.665$, $p=.104$. Based on the results of the independent samples t-tests, walking performance and MPI Interference were included as

a potential predictor in the forward binary logistic regression. In addition, race and

insurance type were included based on the demographic analysis. Standing performance

was excluded due to its high correlation with walking (r=.459).

Forward Binary Logistic Regression

For the MCOP sample, a forward binary logistic regression revealed a Wald

Ratio for walking performance, β=15.735, $\chi^2(1)$=.000, p=.992; however, it was not

significant (see Table 17). As this Wald ratio was not significant, no definitive

information could be gained from the statistical model.

Forward Binary Logistic Regression without Initial Walking Ability

For the MCOP sample, a forward binary logistic regression was conducted

secondarily without walking performance, instead entering standing performance as a

potential predictor. This analysis revealed no significant statistical model, as all variables

were excluded from the model (see Table 17).

Focused Interdisciplinary Treatment Utilizing Revised Definition of Success

Identifying Potential Predictor Variables

For the FIT sample, independent samples t-tests (see Table 16) revealed

significant differences between S and US participants in age, $t(103)$=4.421, p<.001; hours

resting, $t(102)$=2.306, p=.023; walking performance, $t(103)$=-11.108, p<.001; and

standing performance, $t(103)$=-3.667, p<.001. S participants were younger (M=50.99)

than US participants (M=64.09), reported resting fewer hours per day (S M=3.78; US

M=5.18), and demonstrated higher initial physical abilities in the areas of walking (S

M=18.95; US M=9.05) and standing (S M=18.41; US M=12.00). Significance was

approached in chronicity of pain, $t(102)=1.958$, $p=.053$; and number of visits to a mental

health professional over the 12 months prior to treatment, $t(103)=-1.379$, $p=.074$.

Correlational analysis revealed significant correlations among age and walking ($r=-.363$),

and walking and standing performances ($r=.616$). Based on the results of the

independent samples t-tests all of the variables that were significantly different or

approached significance were utilized in the forward binary logistic regression, except

age as it was highly correlated with walking ($r=-.363$). In addition, race and insurance

type were included due to the demographic analyses.

Forward Binary Logistic Regression

For the FIT sample, a forward binary logistic regression revealed a significant

Wald Ratios for walking performance, $\beta=.813$, $\chi^2(1)=16.717$, $p<001$ (see table 17). The

odds ratio for walking was 2.254 (CI 1.527 to 3.327). These results indicated that for

every one lap walked at pre-treatment, chances of walking 15 or more laps at post-

treatment increased by 225.4%. Utilizing pre-treatment walking performance, this model

correctly classified 93.2% of FIT graduates.

Forward Binary Logistic Regression Initial Walking Ability

For the FIT sample, a forward binary logistic regression was conducted

secondarily without walking performance, and including age as a potential predictor. This

analysis revealed significant Wald Ratios for age, $\beta=-.079$, $\chi^2(1)=9.458$, $p=.002$; and

standing, β=.188, $\chi^2(1)$=7.776, *p*=.005 (see Table 17). The odds ratio for age was .924

(CI .879 to .972), and 1.207 (CI 1.057 to 1.378) for standing performance. These results

indicated that for every one year increase in age, chances of being "unsuccessful," as

defined by walking less than 15 laps at post-treatment, increased by 8.2%, and with every

one sit to stand repetition at pre-treatment, chances of being "successful" increased by

20.7%. Utilizing age and standing performance, this model correctly classified 86.4% of

FIT graduates. These predictors, although significant, displayed less predictive ability

than pre-treatment walking performance.

Summary of Predictors of Success, Hypothesis C3

In summary, analyses of Hypothesis C3 several various predictors of success (see

Tables 15 and 17). Success was defined in two ways; the first being a 20% increase in

pre-treatment walking ability, and the second being 15 or more laps walked at post-

treatment. For the 20% increase in walking ability definitions, pre-treatment walking

performance was a stable across all of the programs except MCOP. For the overall

sample, lower pre-treatment walking and higher BDI-II scores were predictive of a

successful increase in physical functioning. When walking performance was removed

from the analyses, higher scores on the MPI Distress scale and lower standing ability

were significant predictors. For the COP sample, higher levels of depression (BDI-II)

and lower walking ability at pre-treatment were predictive of successful increases in

physical functioning. When pre-treatment walking performance was removed a potential

predictor, fewer sit to stand repetitions at pre-treatment were predictive of success. For

the MCOP sample, no predictors of success were identified by the statistical model. For

the FIT program, lower pre-treatment walking ability was predictive of a successful increase in physical functioning. When pre-treatment walking was removed as a potential predictor, lower standing ability was a predictor success.

When success was defined as 15 or more laps walked at post-treatment, pre-treatment walking ability remained a significant predictor in the overall sample, as well as each of the individual treatment programs, including MCOP. In contrast to the previous definition of success in which lower pre-treatment walking ability was predictive of success, *higher* walking ability was predictive of success utilizing the second definition (walking 15 or more laps at post-treatment). For the overall sample and the COP sample, younger age and greater walking ability at pre-treatment were predictive of walking 15 or more laps at post-treatment. When pre-treatment walking was removed as a potential predictor, younger age remained a significant predictor. In addition, greater standing ability at pre-treatment was predictive of success, as defined by walking 15 or more laps at post-treatment, in both the overall sample and COP. For the MCOP sample, greater pre-treatment walking ability was predictive of success; when it was removed as a potential predictor no significant predictors were identified. For the FIT sample, as with the other programs, higher pre-treatment walking ability was predictive of walking 15 or more laps at post-treatment. When walking was removed as a potential predictor, younger age and greater standing ability were predictive of success.

Comparisons of Successful and Unsuccessful Participants on Pre- and Post-Treatment

Walking Ability Utilizing Revised Definition of Success

As with previous analyses, it was deemed important to compare S and US participants on pre- and post-treatment walking abilities to ensure true differences existed.

Overall Sample

For the overall sample, independent samples t-tests revealed that the two groups differed significantly at pre-treatment, $t(164.403)=-21.026$, $p<.001$. The mean walking scores at pre-treatment were 16.51 for S participants and 8.03 for US participants. Independent samples t-tests revealed that, at post-treatment, the two groups differed significantly as well, $t(241.456)=-34.719$, $p<.001$. The mean walking score at post-treatment was 22.76 for S participants and 11.06 for US participants.

Comprehensive Outpatient Program

Looking at just COP participants, independent samples t-tests revealed that S and US participants differed significantly at pre-treatment, $t(107.492)=-17.179$, $p<.001$, with S participants having higher initial walking ability (M=16.31) than US participants (M=7.89). The two groups differed significantly at post-treatment as well, $t(174.003)=-30.592$, $p<.001$. Again, S participants displayed greater walking ability (M=23.12) than US participants (M=11.46).

Modified Comprehensive Outpatient Program

Independent samples t-tests were conducted to evaluate differences in walking ability between S and US participants in the MCOP program. Analysis of pre-treatment scores revealed that the two groups differed significantly, $t(39)=-7.502$, $p<.001$; with S participants having higher initial walking scores (M=15.71) than US participants (M=6.14). The two groups differed significantly in post-treatment walking performance as well, $t(39)=-6.911$, $p<.001$. Again, S participants displayed greater walking ability (M=20.62) than US participants (M=9.71).

Focused Interdisciplinary Treatment

For the FIT program, independent samples t-tests comparing S and US participants' pre-treatment walking scores revealed significant difference between the two groups, $t(103)=11.108$, $p<.001$. S participants displayed higher levels of initial physical abilities (M=18.95) compared to US participants (M=9.05). Differences between the two groups in post-treatment walking performance were significant as well, $t(57.792)=-15.723$, $p<.001$. Again, S participants displayed higher levels of walking ability at post-treatment (M=21.64) than US participants (M=10.36).

Comparison of Treatment Programs on Walking Ability

A repeated measures analysis of covariance (ANCOVA) examined changes in walking abilities scores across time among different treatment groups while controlling for initial walking performance. Differences among pre- and post-treatment scores were significant, $F(1,665)=198.062$, $p<.001$. A significant interaction existed between pre-

treatment walking scores and changes across time, $F(1,665)=42.442$, $p<.001$.

Furthermore, a significant interaction between change across time and treatment program was found, $F(2,665)=36.242$, $p<.001$. Pairwise comparisons revealed significant differences in estimated marginal means among all treatment groups. The strongest significant difference was detected between COP (M=5.688) and FIT (M=3.765; $p<.001$), followed by MCOP (M=4.623) and COP ($p=.003$). The weakest significant difference was seen between MCOP and FIT ($p=.032$).

Hypothesis C4: Predictors of Success as Decreased MPI Pain

It was hypothesized that individuals with lower levels of distress and higher levels of activity at baseline would be more likely to be considered successful, as measured by a 20% decrease in pain severity. Analyses were run for the overall sample, as well as for each treatment program separately.

Overall Sample

Identifying Potential Predictor Variables

For the overall sample, independent samples t-tests (see Table 18) revealed that S participants differed significantly from US participants on chronicity of pain, $t(668.55)=2.412$, $p=.016$; number of physician visits, $t(601.45)=3.131$, $p=.002$; and number of surgeries over the twelve months prior to treatment, $t(460.45)=3.653$, $p<.001$; MPI Pain, $t(735.02)=-4.895$, $p<.001$; and MPI Interference, $t(738.91)=-2.223$, $p=.026$. S participants reported a shorter chronicity of pain (M=82.94) than US participants (M=102.50), fewer physician visits (S M=8.88; US M=11.03), and fewer surgeries (S

M=.49; US M=.99). Furthermore, S participants reported higher pain (S M=8.93; US

M=8.20), and greater interference (S M=10.11; US M=9.73). MPI Pain and MPI

Interference were highly correlated (*r*=.379). Based on previous analyses, and the fact

that initial MPI Pain was utilized in the calculation of "success," it was deemed prudent

to conduct a forward binary logistic regression including MPI Pain as a potential

predictor, and one without. MPI Interference was used in the analysis without MPI Pain.

Pain chronicity, physician visits, and surgeries were included in both forward binary

logistic regressions, as well as perceived physical health, based on its association with the

criterion variable. In addition, insurance type and race were included due to the

demographic analyses. All other variables were excluded from subsequent analyses.

Forward Binary Logistic Regression

For the overall sample, a forward binary logistic regression produced a statistical

model which utilized insurance type, physician visits, surgeries, and MPI Pain. The

Wald Ratios were not significant for worker's compensation, β=-2.166, $\chi^2(1)$=3.634,

p=.057; commercial insurance, β=-1.738, $\chi^2(1)$=2.427; *p*=.119; Medicare insurance, β=-

1.325, $\chi^2(1)$=1.457, *p*=.227; "other" insurance, β=-1.155, $\chi^2(1)$=1.094, *p*=.296 (see Table

19). Significant Wald Ratios were obtained for chronicity of pain β=-.002, $\chi^2(1)$=5.607,

p=.018; physician visits, β=-.032, $\chi^2(1)$=10.799, *p*=.001; surgeries, β=-.247,

$\chi^2(1)$=12.900, *p*<.001; and MPI Pain, β=.212, $\chi^2(1)$=26.969, *p*<.001 (see Table 18).

Analysis revealed an odds ratio of .115 (CI .012 to 1.063) for worker's compensation;

.176 (CI .020 to 1.566) for commercial insurance; .266 (CI .031 to 2.285) for Medicare;

.315 (CI .036 to 2.744) for "other" insurance; and an odds ratio of .998 (CI 0.997 to

1.000) was revealed for chronicity of pain. These results indicated that the odds of

having a significant decrease in pain were lower for those whose primary payer was

Worker's Compensation but the Wald statistics indicated that these odds were too small

for insurance type to be considered statistically significant. In addition, this indicated

that chances of significantly decreasing pain from pre- to post-treatment decreases as

chronicity of pain decreases. However, due to the range of the 95% Confidence

Intervals, the chance of making a Type I error is high for insurance type and chronicity of

pain; thus, no conclusions about predictive value can be made in regards to these

variables. Physician visits yielded an odds ratio of .969 (CI .951 to .987); surgeries an

odds ratio of .781 (CI .683 to .894); and MPI Pain an odds ratio of 1.237 (CI 1.141 to

1.340). These results indicated that for each visit to the physician over the twelve months

prior to treatment, the chance of not decreasing pain, increased by 10.3%; for each

surgery undergone in the twelve months prior to treatment, the chance of not decreasing

pain increased by 28.04%; and for each one point decrease in pain severity at pre-

treatment, chances of not decreasing pain increased by 23.7%. Utilizing insurance type,

chronicity of pain, physician visits, surgeries, and MPI Pain, this model correctly

classified 64.4% of graduates in the overall sample.

Forward Binary Logistic Regression without Initial MPI Pain

For the overall sample, a forward binary logistic regression, replacing MPI Pain

with MPI Interference, revealed significant Wald Ratios for physician visits, β=-.030,

$\chi^2(1)$=10.216, p=.001; number of surgeries, β=-.214, $\chi^2(1)$=11.035, p=.001; and MPI

Interference, β=.083, $\chi^2(1)$=6.279, p=.012 (see Table 19). All other predictors were

excluded from the analysis. Analysis revealed an odds ratio of .971 (CI .955 to .990) for

number of physician visits; .808 (CI .712 to .916) for surgeries; and 1.087 (CI 1.018 to

1.160) for MPI Interference. These results indicated that for each visit to a physician in

the twelve months prior to treatment, chances of being unsuccessful, as defined by a lack

of decrease in pain, increased by 2.98%; with each additional surgical procedure

undergone in the twelve months prior to treatment, chances of improving decreased by

23.76%; and with each one point decrease in MPI Interference scores, chances of not

decreasing pain increased by 8.7%. This model, utilizing physician visits, surgeries, and

MPI Interference scores, correctly classified 55.3% of graduates in the overall sample;

this classification ability did not exceed the classification ability of the constant (i.e., the

model was no better than chance).

Comprehensive Outpatient Program

  Identifying Potential Predictor Variables

  For the COP graduates, independent samples t-tests (see Table 18) revealed

statistically significant differences between S and US participants in chronicity of pain,

$t(480)=2.413$, $p=.019$; physician visits in the twelve months prior to treatment,

$t(373.269)=2.346$; $p=.020$; number of surgeries in the twelve months prior to treatment,

$t(299.389)=3.068$, $p=.002$; and MPI Pain, $t(478.409)=-4.427$, $p<.001$. S participants

reported a shorter chronicity of pain (M=76.84) than US participants (M=100.89), fewer

physician visits (S M=9.35; US M=11.48), fewer surgeries S M=.55; US M=1.10), and

greater pain (S M=9.20; US M=8.48). Significance was approached in number of

emergency room visits in the twelve months prior to treatment, $t(489.354)=-1.610$,

p=.108. These variables were selected as a potential predictor. In addition, race and

insurance type were included in the forward binary logistic regression due to the

demographic analysis. All other variables were removed from subsequent analyses.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of

success in COP, as defined by 20% decrease in reported pain severity (as measured by

MPI Pain) from pre- to post-treatment. ER visits were excluded from the statistical

model. The Wald Ratios were not significant for Worker's Compensation, β=-2.188,

$\chi^2(1)$=3.668, *p*=.055; commercial insurance, β=-1.787, $\chi^2(1)$=2.536, *p*=.111; Medicare

insurance, β=-1.216, $\chi^2(1)$=1.209, *p*=.272; and "other" insurance, β=-0.944, $\chi^2(1)$=.715,

p=.398 (see Table 18). Significant Wald Ratios were obtained for chronicity of pain, β=-

.002, $\chi^2(1)$=4.731, *p*=.030; physician visits, β=-.029, $\chi^2(1)$=6.232, *p*=.013; surgical

procedures, β=-.246, $\chi^2(1)$=9.448, *p*=.002; and MPI Pain, β=.272, $\chi^2(1)$=20.437, *p*<.001

(see Table 19). Odds ratios for Worker's Compensation (OR=.112; CI .012 to 1.052),

commercial insurance (OR=.168; CI .019 to 1.510), Medicare (OR=.297; CI .034 to

2.590), "other" insurance (OR= .389; CI .044 to 3.472), and chronicity of pain (OR=.998;

CI .996 to 1.000) revealed confidence intervals which included one. This indicated that

the likelihood of a type I error is high; thus, no statements regarding the predictive value

of these variables can be made. Significant and useful odds ratios were obtained for

physician visits (OR=.972; CI .950 to .994), surgeries (OR=.782; CI .669 to .915), and

MPI Pain (OR=1.312; CI 1.166 to 1.476). These results indicated that for each visit to

the physician and each surgery over the twelve months prior to treatment, the chance of

being "unsuccessful" in terms of decrease in pain, increased by 2.88% and 27.87%, respectively. Furthermore, for each one point decrease in pain severity at pre-treatment, chances of being "unsuccessful" were increased by 31.2%. Utilizing insurance type, chronicity of pain, physician visits, surgeries, and MPI Pain, this model correctly classified 66.1% of COP graduates.

<p style="text-align:center">Forward Binary Logistic Regression without Initial MPI Pain</p>

It was again deemed prudent to rerun the forward binary logistic regression without pre-treatment MPI Pain entered as a potential predictor of success in COP. None of the variables correlated highly with MPI Pain (i.e. r>.30) were significantly different between "successful" and "unsuccessful" participants. Thus, no variable was substituted for MPI Pain in the second binary logistic regression. The Wald Ratios were not significant for commercial insurance, β=-1.887, χ^2(1)=2.889, p=.089; Medicare, β=-1.367, χ^2(1)=1.560, p=.212; and "other" insurance, β=-1.185, χ^2(1)=1.152, p=.283 (see Table 18). Thus, statements about the predictive value of these variables cannot be made with a high degree of confidence. Significant Wald Ratios were revealed for Worker's Compensation, β=-2.222, χ^2(1)=3.865, p=.049; chronicity of pain, β=-.003, χ^2(1)=6.420, p=.011; physician visits, β=-.026, χ^2(1)=5.672, p=.017; and surgical procedures, β=-.199, χ^2(1)=6.993, p=008 (see Table 19). Analysis revealed an odds ratio of .108 (CI .012 to .993) for Worker's Compensation; .997 (CI .996 to .999) for chronicity of pain; .974 (CI .953 to .995) physician visits; and .819 (CI .707 to .950) for surgeries. These results indicated that individuals who had Worker's Compensation as their primary insurance had a nine times greater chance of being "unsuccessful" in terms of decreasing pain with

success defined as a 20% or greater decrease in pain. However, this number should be interpreted with caution given the wide range of the confidence interval. Furthermore, for every one month increase in chronicity of pain, chances of being "unsuccessful" increased by 0.3%; for each physician visit and surgical procedure in the twelve months prior to treatment, chances of being "unsuccessful" were increased by 2.6% and 22.1%, respectively. This model, utilizing insurance type, chronicity of pain, physician visits, and surgical procedures, correctly classified 59.1% of COP graduates.

Modified Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the MCOP graduates, independent samples t-tests (see Table 18) revealed no statistically significant differences between S and US participants. Significance was approached in chronicity of pain, $t(38.547)=1.998$, $p=.053$; physician visits in the twelve months prior to treatment, $t(39)=1.816$, $p=.077$; number of ER visits in twelve months prior to treatment, $t(30.672)=1.773$, $p=.086$; number of surgeries in the twelve months prior to treatment, $t(36.704)=1.335$, $p=.190$; MPI Pain, $t(41)=-1.856$, $p=.070$; and MPI Interference, $t(41)=-1.719$, $p=.093$. Pearson correlations revealed MPI Pain and MPI Interference to be highly correlated ($r=.329$). Given that pre-treatment MPI Pain was utilized in the calculations on which "successful" and "unsuccessful" were based, it was decided to run two separate forward binary logistic regressions; one utilizing MPI Pain and excluding MPI Interference, and one including MPI Interference but not MPI Pain. Thus, for the first analysis, chronicity of pain, physician visits, ER visits, surgical procedures, and MPI Pain were selected as a potential predictor. In addition, race and

insurance type were included due to the demographic analysis. All other variables were removed from subsequent analyses.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of success in MCOP, as defined by 20% decrease in reported pain severity (as measured by MPI Pain) from pre- to post-treatment. None of the variables investigated were included in the statistical model.

Forward Binary Logistic Regression without Initial MPI Pain

For the MCOP sample, second binary logistic regression was conducted utilizing MPI Interference in place of MPI Pain. Again, the statistical model excluded all predictors.

Focused Interdisciplinary Treatment

Identifying Potential Predictor Variables

For the FIT graduates, independent samples t-tests (see Table 18) revealed no statistically significant differences between S and US participants.   Significance was approached in number of physician visits in the twelve months prior to treatment, $t(197)=1.555$, $p=.122$; number of surgical procedures in the twelve months prior to treatment, $t(123.402)=1.850$, $p=.067$; MPI Pain, $t(200)=-1.614$, $p=.075$; MPI Interference, $t(196.819)=-1.614$, $p=.108$; and walking performance, $t(100)=1.948$, $p=.054$. Pearson correlations revealed MPI Pain and MPI Interference to be highly correlated ($r=.358$).

Given that pre-treatment MPI Pain was utilized in the calculations on which "successful" and "unsuccessful" were based, it was decided to run two separate forward binary logistic regressions; one utilizing MPI Pain and excluding MPI Interference, and one including MPI Interference but not MPI Pain. Thus, for the first analysis, physician visits, surgical procedures, MPI Pain, and walking performance were selected as a potential predictor. In addition, race and insurance type were included in the forward binary logistic regression due to the demographic analysis. All other variables were removed from the analyses.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of success in FIT, as defined by 20% decrease in reported pain severity (as measured by MPI Pain) from pre- to post-treatment. All predictor variables were excluded from the statistical model.

Forward Binary Logistic Regression without Initial MPI Pain

The second binary logistic regression investigating predictors of success in FIT, which included MPI Interference as a predictor in place of pain, again yielded no significant findings. The statistical model excluded all variables.

Summary of Predictors of Success, Hypothesis C4

In summary, analyses of Hypothesis C4 revealed various predictors of success (See Table 19) for the overall sample and COP, but no significant predictors for MCOP and FIT. Success was defined as a 20% decrease in pain severity, as reported on the MPI Pain scale. For the overall sample, shorter chronicity of pain, fewer physician visits and surgeries over the twelve months prior to treatment, and greater reported pain severity were predictive of success. Insurance type was also included in the model, but none of the types were significant. When pre-treatment pain severity was removed from the analyses, fewer physician visits and surgeries over the twelve months prior to treatment remained significant predictors of success. In addition, greater interference from pain was predictive of success. For the COP sample, shorter chronicity of pain, fewer physician visits and surgeries over the twelve months prior to treatment, and greater severity of pain were predictive of successful decreases in pain. Insurance type was also included in the statistical model, but was not statistically significant. When pre-treatment pain was removed as a potential predictor, shorter chronicity of pain and fewer physician visits and surgeries remained predictive of success. In addition utilizing Worker's Compensation as primary insurance type was predictive of being unsuccessful. For the MCOP sample, no predictors of success were identified by the statistical model. Similarly, no predictors of success were identified for FIT.

Comparisons of Successful and Unsuccessful Participants on MPI Pain

    Overall Sample

        Based on findings with the previous definitions of success, comparisons of S and US participants were conducted on pre- and post-treatment MPI Pain scores. For the overall sample, independent samples t-tests revealed significant difference between S and US participants on pre-treatment MPI Pain scores, $t(735.023)=-4.895$, $p<.001$. S participants reported a mean score of 8.93, while US participants reported a mean score of 8.20. Independent samples t-tests revealed that, at post-treatment, the two groups differed significantly as well, $t(767)=20.802$, $p<.001$. The mean MPI Pain score at post-treatment was 5.51 for S participants and 8.29 US participants.

    Comprehensive Outpatient Program

        Looking at just COP participants, independent samples t-tests revealed S and US participants differed significantly at pre-treatment, $t(478.409)=-4.427$, $p<.001$; with S participants reporting higher initial reported pain severity (M=9.20) than US participants (M=8.48). The two groups differed significantly at post-treatment as well, $t(522)=18.137$, $p<.001$. S participants had lower mean MPI Pain scores at post-treatment (M=5.63) than US participants (M=8.41).

    Modified Comprehensive Outpatient Program

        Independent samples t-tests were conducted to evaluate differences in MPI Pain Scores between S and US participants in the MCOP program. Analysis of pre-treatment scores revealed that the two groups did not differ significantly, $t(41)=-1.856$, $p=.071$.

The mean pre-treatment MPI scores for S and US participants were 9.16 and 8.33, respectively. Significant differences in post-treatment MPI Pain scores were found, $t(41)=5.865$, $p<.001$; with S participants having lower mean MPI Pain scores (M=5.68) than US participants (M=8.79).

Focused Interdisciplinary Treatment

For the FIT program, independent samples t-tests comparing S and US participants' pre-treatment MPI Pain scores revealed no significant difference between the two groups, $t(200)=-1.789$, $p=.075$. S participants reported similar levels of initial pain severity (M=8.14) compared to US participants (M=7.51). Differences between the two groups at post-treatment were significant, $t(200)=9.414$, $p<.001$; with S participants reporting lower pain severity (M=5.12) than US participants (M=7.88).

Comparison of Treatment Programs on MPI Pain

A repeated measures analysis of covariance (ANCOVA) examined changes in MPI Pain scores across time among different treatment groups while controlling for initial MPI Pain ratings. Differences in MPI Pain from pre- to post-treatment scores were significant, $F(1,765)=67.505$, $p<.001$. A significant interaction existed between pre-treatment MPI Pain scores and changes across time, $F(1,765)=185.063$, $p<.001$. The interaction between change across time and treatment program was not significant, $F(2,765)=1.516$, $p=.220$.

Hypothesis C5: Predictors of Success as Increased MPI Control

It was hypothesized that individuals with lower levels of distress would be more likely to be considered successful, as measured by a 20% increase in self-efficacy (MPI Control). Analyses were run for the overall sample, as well as for each treatment program separately.

Overall Sample

Identifying Potential Predictor Variables

For the overall sample, independent samples t-tests (see Table 20) revealed that S and US participants differed significantly in hours resting, $t(755)=-2.098$, $p=.036$; MPI Pain, $t(762)=-3.429$, $p=.001$; MPI Interference, $t(590.740)=-4.294$, $p<.001$; MPI Distress, $t(641.693)=-5.388$, $p<.001$; MPI Control, $t(762)=21.168$, $p<.001$; BDI-II, $t(761)=-5.643$, $p<.001$; BAI, $t(760)=-4.559$, $p<.001$; and perceived physical health, $t(758)=4.616$, $p<.001$. S participants reported resting more (M=5.50) than US participants (M=5.04), greater pain (S M=8.76; US M=8.24), greater interference from pain (S M=10.23; US M=9.46), greater distress (S M=7.72; US M=6.49), and higher levels of depression (S M=22.65; US M=18.41), and anxiety (S M=17.86; US M=14.44). Additionally, S participants reported less control over pain (S M=5.36; US M=8.47), and lower perceived physical health (S M=23.98; US M=26.02). For the overall sample, BDI-II, BAI, and hours resting were removed from subsequent analyses based on their correlations with other measures and the strength of their relationship with the criterion variable. Correlational analysis of the remaining variables revealed several strong correlations. High correlations were seen among MPI Pain and MPI Interference ($r=.392$), MPI Pain

and MPI Distress (r=.398), MPI Pain and perceived physical health (r=-.315), MPI Interference and MPI Distress (r=.364), MPI Interference and perceived physical health (r=-.461), and MPI Distress and MPI Control (r=-.438). These findings suggest that the correlated variables assessed similar constructs.

A forward binary logistic regression was run with all of the above variables entered as potential predictors, in addition to insurance type and race. Models which included highly correlated variables were ignored.

Forward Binary Logistic Regression

For the overall sample, a forward binary logistic regression produced a statistical model, void of correlated variables, with a significant Wald Ratio for MPI Control, β=-.734, $\chi^2(1)$=189.999, $p<.001$ (see Table 21). Analysis revealed an odds ratio of .480 (CI .399 to .504) for MPI Control. These results indicated that for each one point decrease in pre-treatment MPI Control scores, there was a twofold increase in chances of showing an improvement on post-treatment MPI Control scores. Utilizing MPI Control, this model correctly classified 77.6% of graduates in the overall sample.

Forward Binary Logistic Regression without Initial MPI Control

Given that pre-treatment MPI Control was utilized in classifying success in this hypothesis, it was deemed prudent to identify a model which did not utilize MPI Control. For the overall sample, a second forward binary logistic regression was conducted with MPI Distress, and perceived physical health entered as potential predictors. Analysis revealed significant Walk Ratios for MPI Distress, β=.108, $\chi^2(1)$=18.193, $p<.001$; and

perceived physical health, β=-.042, $\chi^2(1)$=10.281, p=.001 (see Table 21). This analysis

revealed an odds ratio of 1.114 (CI 1.060 to 1.170) for MPI Distress, and .959 (CI .934 to

.984) for perceived physical health. These results indicated that for each one point

increase in pre-treatment MPI Distress scores, the odds of being successful, as defined by

a 20% or greater increase in control, increased by 11.4%; and for each one point decrease

in perceived physical health at treatment initiation, the chances of being successful

increased by 4.2%. Utilizing MPI Distress and perceived physical health, this model

correctly classified 60.8% of graduates in the overall sample. These predictor variables

were not as robust as MPI Control.

Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the COP graduates, independent samples t-tests (see Table 20) revealed

statistically significant differences between S and US participants in MPI Pain, $t(516)$=-

1.972, p=.049; MPI Interference, $t(516)$=-2.316, p=.021; MPI Distress, $t(516)$=-3.147,

p=.002; MPI Control, $t(516)$=16.260, p<.001; BDI-II, $t(515)$=-3.679, p<.001; BAI,

$t(514)$=-3.281, p=.001; and perceived physical health, $t(512)$=3.073, p=.002. S

participants reported higher levels of pre-treatment pain (M=8.95) than US participants

(M=8.61), as well as greater interference from pain (S M=10.54; US M=10.11), greater

distress (S M=7.92; US M=7.07), and higher levels of depression (S M=23.79; US

M=20.37) and anxiety (S M=18.78; US M=15.75). In addition, S participants reported

lower sense of control over pain (S M=5.21; US M=8.14), and lower perceived physical

health (S M=23.15; US M=24.59). Correlations above the .30 cut-off were found among

MPI Pain and Interference (r=.329), MPI Pain and Distress (r=.373), MPI Interference and BDI-II (r=.314), MPI Interference and perceived physical health (r=-.325), MPI Distress and Control (r=-.365), MPI Distress and BDI-II (r=.555), MPI Control and BDI-II (r=-.338), and BAI and BDI-II (r=.559).   These findings suggest that the correlated variables assessed similar constructs.

A forward binary logistic regression was run with all of the above variables entered as potential predictors. In addition, race and insurance type were included in the forward binary logistic regression due to the demographic analysis. Models which included highly correlated variables were ignored.

Forward Binary Logistic Regression

For the COP sample, a forward binary logistic regression produced a statistical model which excluded all variables except MPI Control. A significant Wald Ratio for MPI Control was revealed, β=-.723, $\chi^2(1)$=120.885, p<.001 (see Table 21). Analysis revealed an odds ratio of .485 (CI .427 to .552). These results indicated that for each one point decrease in pre-treatment MPI Control (perceived self-efficacy), the chances of displaying significant increases in control over pain increased by 206%. Utilizing MPI Control, this model correctly classified 79.0% of COP graduates.

Forward Binary Logistic Regression without Initial MPI Control

As with previous definitions of success, it was deemed prudent to exclude MPI Control as a predictor in the statistical model, as that score was utilized in calculating success. For the COP sample, a second forward binary logistic regression was conducted

with the variables from the previous analysis, excluding MPI Control. Significant Wald

Ratios were revealed for MPI Distress, β=.083, $\chi^2(1)$=6.871, p=.009; and perceived

physical health, β=-.046, $\chi^2(1)$=6.530, p=.011 (see Table 21). All other variables were

excluded from the statistical model. Analyses revealed an odds ratio of 1.087 (CI 1.021

to 1.157) for MPI Distress and an odds ratio of .955 (CI .921 to .989) for perceived

physical health. These results indicated that for each one point increase in reported

distress at pre-treatment, chances of being successful, as defined by a 20% or greater

increase in control over pain, increase by 8.7%; and for each one point decrease in

perceived physical health, chances of showing improvement on post-treatment MPI

Control scores increase by 4.7%. Utilizing MPI Distress and perceived health, this model

correctly classified 65.4% of COP graduates. Again, these predictor variables were not

as robust as MPI Control.

Modified Comprehensive Outpatient Program

   Identifying Potential Predictor Variables

   For the MCOP graduates, independent samples t-tests (see Table 20) revealed

statistically significant differences between S and US participants in MPI Control scores,

$t(41)$=4.607, p<.001; with S participants reporting less control over pain (M=5.92) than

US participants (M=8.39). Significance was approached in chronicity of pain,

$t(27.530)$=1.617, p=.117. These variables were entered as potential predictors into the

forward binary logistic regression. In addition, race and insurance type were included

due to the demographic analysis. All other variables were removed from subsequent

analyses.

Forward Binary Logistic Regression

Results of the forward binary logistic regression investigating predictors of success in MCOP revealed a significant Wald Ratio for MPI Control, β=-.634, $\chi^2(1)$=9.349, *p*=.002 (see Table 21). Analyses revealed an odds ratio of .530 (CI .358 to .796) for MPI Control. These results indicated that for each one point decrease in initial MPI Control scores, chances of showing improvement on post-treatment MPI Control scores increased by 88.6%. This model, utilizing MPI Control, correctly classified 74.4% of MCOP graduates. All other variables were excluded from the statistical model.

Forward Binary Logistic Regression without Initial MPI Control

For the MCOP sample, a forward binary logistic regression was conducted without MPI Control entered as a predictor, including only chronicity of pain. This analysis excluded all variables from the statistical model.

Focused Interdisciplinary Treatment

Identifying Potential Predictor Variables

For FIT graduates, independent samples t-tests (see Table 20) revealed statistically significant differences between S and US participants in MPI Interference, *t*(200.334)=-2.418, *p*=.017, MPI Distress, *t*(201)=-3.406, *p*=.001, MPI Control, *t*(201)=11.341, *p*<.001, and BDI-II, *t*(201)=-2.846, *p*=.005. S participants reported greater interference from pain (M=9.21) than US participants (M=8.28), more distress (S M=7.02; US M=5.46), higher levels of depression (S M=18.67; US M=14.92), and less control (S M=5.78; US M=9.03). Significance was approached in MPI Pain, *t*(201)=-

1.663, *p*=.098. Pearson correlations revealed high correlations among MPI Pain and MPI

Interference (*r*=.380), MPI Pain and MPI Distress (*r*=.377), MPI Interference and MPI

Distress (*r*=.355), MPI Interference and BDI-II (*r*=.438), MPI Distress and MPI Control

(*r*=-.481), MPI Distress and BDI-II (*r*=.594), and MPI Control and BDI-II (*r*=-.401). A

forward binary logistic regression was run with all of the above variables entered as

potential predictors. In addition, race and insurance type were included in the forward

binary logistic regression due to the demographic analysis. Models which included

highly correlated variables were ignored.

> *Forward Binary Logistic Regression*

For the FIT sample, the statistical model from the forward binary logistic

regression excluded all variables except MPI Control, which yielded a significant Wald

Ratio, β=-.759, $\chi^2(1)$=50.630, *p*<.001 (see Table 21). Analysis revealed an odds ratio for

MPI Control of .468 (CI .380 to .577). These results indicated that for each one point

decrease in pre-treatment MPI Control (perceived self-efficacy), the chances of

displaying significant increases in control at post-treatment increased by 213%. Utilizing

MPI Control, this model correctly classified 75.4% of FIT graduates.

> *Forward Binary Logistic Regression without Initial MPI Control*

As with previous analyses, MPI Control was excluded as a potential predictor of

success in the FIT sample in a second forward binary logistic regression. This secondary

forward binary logistic regression was conducted with the variables from the previous

analysis, excluding MPI Control. A significant Wald Ratio was found for MPI Distress,

$\beta=.148$, $\chi^2(1)=10.651$, $p=.001$ (see Table 21); all other variables were excluded from the statistical model. Analyses revealed an odds ratio of 1.160 (CI 1.061 to 1.268) for MPI Distress. These results indicated that for each one point increase in reported distress at pre-treatment, chances of displaying successful increases in control at post-treatment increase by 16%. Utilizing MPI Distress, this model correctly classified 58.1% of FIT graduates. Again, these predictor variables were less robust than MPI Control.

Summary of Predictors of Success, Hypothesis C5

In summary, analyses of Hypothesis C5 revealed various predictors of success (see Table 21). Success was defined as a 20% increase in MPI Control score from pre- to post-treatment. For the overall sample, as well as each of the individual treatment programs, lower pre-treatment MPI Control was the sole predictor of success in initial analyses. When pre-treatment MPI Control was removed from the analysis higher scores on the MPI Distress scale and lower perceived physical health were predictive of success in COP and the overall sample. For the MCOP sample, no predictors were identified when MPI Control was removed. For the FIT sample, higher MPI Distress scores was a significant predictor of success.

Comparisons of Successful and Unsuccessful Participants on MPI Control

Based on findings utilizing other measures of success, comparisons of S and US participants were conducted on pre- and post-treatment MPI Control scores. These analyses were conducted for the overall sample, as well as the individual treatment programs.

Overall Sample

For the overall sample, independent samples t-tests revealed that the two groups differed significantly at pre-treatment on MPI Control scores, $t(762)=21.168$, $p<.001$. The mean MPI Control scores at pre-treatment were 5.36 for S participants and 8.47 for US participants. Independent samples t-tests revealed the two groups differed significantly at post-treatment as well, $t(591.996)=-8.892$, $p<.001$. The mean MPI Control score at post-treatment was 9.26 for S participants and 7.78 for US participants.

Comprehensive Outpatient Program

Looking at just COP participants, independent samples t-tests revealed significant difference between S an US participants in pre-treatment MPI Control scores, $t(516)=16.260$, $p<.001$; with S participants reporting lower initial self-efficacy (M=5.21) than US participants (M=8.14). The two groups differed significantly at post-treatment as well, $t(325.093)=-7.574$, $p<.001$. S participants reported higher mean MPI Control scores (M=9.21) than US participants (M=7.62).

Modified Comprehensive Outpatient Program

Independent samples t-tests were conducted to evaluate differences in MPI Control scores between S and US participants in the MCOP program. Analysis of pre-treatment scores revealed that the two groups differed significantly, $t(41)=4.067$, $p<.001$. The mean pre-treatment MPI Control scores for S and US participants were 5.92 and 8.39, respectively. Significant differences in post-treatment MPI Control scores were

also found, $t(29.912)=-4.112$, $p<.001$; with those S participants reporting higher mean MPI Control scores (M=9.72) than US participants (M=7.39).

Focused Interdisciplinary Treatment

For the FIT program, independent samples t-tests comparing S and US participants' pre-treatment MPI Control scores revealed significant differences between the two groups, $t(201)=11.341$, $p<.001$. S participants reported lower mean levels of pre-treatment self-efficacy (M=5.78) than US participants (M=9.03). Differences between the two groups at post-treatment were also significant, $t(201)=-3.655$, $p<.001$; with S participants reporting higher levels of self-efficacy (M=9.29) than US participants (M=8.09).

Comparison of Treatment Programs on MPI Control

A repeated measures analysis of covariance (ANCOVA) examined changes in MPI Control scores across time among the different treatment groups while controlling for initial MPI Control ratings. Differences in MPI Control from pre- to post-treatment scores were significant, $F(1,760)=690.684$, $p<.001$. A significant interaction existed between pre-treatment MPI Control scores and changes across time, $F(1,760)=514.615$, $p<.001$. The interaction between change across time and treatment program was not significant, $F(2,760)=2.070$, $p=.127$.

CHAPTER SEVEN
Results

ADDITIONAL ANALYSES

To fulfill the aims of the study, additional analyses were conducted to provide

empirically-based, relevant information to clinicians to assist them in tailoring treatment.

Although the original analyses of the study fulfilled the proposed aims, additional

analyses helped to expand and clarify the original findings.

Comparison of Rates of Success between COP and FIT

Rates of significant improvement in one or more areas of success were examined

between the COP and FIT programs. MCOP was excluded, as it is more of a "hybrid"

program and the sample size is relatively small. Chi-square analyses examined

differences in rates of success in one or more areas between the two groups. COP

showed significantly greater success rates for all definitions (See Table 22). Most

importantly, a significant difference was found between the two groups in success rates

when "success" was defined as displaying success in three of the five previously defined

areas, $\chi^2(1)=48.301, p<.001$.   This translated to 44.5% of participants who completed

FIT showing success in three or more areas compared to 71.3% in COP.

Predictors of Success in Three Areas

Individuals meeting criteria for success in three or more areas were classified as

"successful" and those meeting criteria in two or fewer areas as "unsuccessful" for the

analyses to follow.

Overall Sample

  Identifying Potential Predictor Variables

For the overall sample of graduates, independent samples t-tests (see Table 23) revealed significant differences between S and US participants in number of ER visits, $t(635.349)=-2.204$, $p=.028$; MPI Interference, $t(445.138)=-3.800$, $p<.001$; MPI Distress, $t(750)=-4.331$, $p<.001$, MPI Control, $t(748)=7.008$, $p<.001$; BDI-II, $t(758)=-6.309$, $p<.001$; BAI, $t(749)=-3.498$, $p<.001$; and perceived physical health, $t(495.109)=-3.800$, $p<.001$. S participants reported more visits to the emergency room (M=1.07) than US participants (M=.79), greater interference from pain (S M=10.15; US M=9.40), more distress (S M=7.57; US M=6.55), and greater levels of depression (S M=22.61; US M=17.72) and anxiety (S M=17.44; US M=14.73). In addition, S participants reported less control (S M=6.15; US M=7.49), and lower levels of perceived physical health (S M=24.29; US M=26.13). Significance was approached in number of surgeries in the twelve months prior to treatment, $t(467.729)=1.737$, $p=.083$. Pearson correlations found the following variables to be highly correlated: MPI Interference and Distress ($r=.355$), MPI Interference and BDI-II ($r=.393$), MPI Interference and perceived physical health ($r=-.477$), MPI Distress and Control ($r=-.448$), MPI Distress and BDI-II ($r=.595$), MPI Distress and BAI ($r=.517$), MPI Control and BDI-II ($r=-.408$), MPI Control and BAI ($r=-.394$), BDI-II and BAI ($r=.608$), BDI-II and perceived physical health ($r=-.345$), and BAI and perceived physical health ($r=-.345$). Based on these correlations, as well as the strength of the relationships with the criterion variables, MPI Interference and Distress, BDI-II, and BAI were removed as potential predictors. All other variables in which S

and US participants differed were entered as potential predictors into the forward binary

logistic regression.

Forward Binary Logistic Regression

For the overall sample of graduates, a forward binary logistic regression revealed

significant Wald Ratios for number of surgeries, β=-.085, $\chi^2(1)$=4.130, p=.042; and MPI

Control, β=-.209, $\chi^2(1)$=42.031, $p<.001$ (see Table 24); all other variables were excluded

from the statistical model. Analyses revealed an odds ratio of .918 (CI .845 to .997) for

number of surgeries, and .812 for MPI Control (CI .762 to .864). These results indicated

that for each additional surgery undergone in the twelve months prior to treatment,

changes of showing success in three or more areas decreased by 8.9%; and for every one

point decrease in initial MPI Control scores, chances of showing success in three or more

areas increased by 23.1%. Utilizing number of surgeries and MPI Control, this model

correctly classified 68% of graduates in the overall sample.

Comprehensive Outpatient Program

Identifying Potential Predictor Variables

For the COP graduates, independent samples t-tests (see Table 23) revealed

significant differences between S and US participants in number of surgeries in the

twelve months prior to treatment, $t(195.195)$=2.394, p=.018; MPI Interference, $t(530)$=-

1.599, p=.110; MPI Distress, $t(530)$=-2.929, p=.004; MPI Control, $t(528)$=4.905, $p<.001$;

BDI-II, $t(530)$=-4.377, $p<.001$; BAI, $t(529)$=-2.662, p=.008; and perceived physical

health, $t(230.566)$=2.894, p=.004. S participants reported fewer surgeries (M=.66) than

US participants (M=1.20), less control (S M=5.92; US M=7.08), and lower levels of

perceived physical health (S M=23.23; US M=24.81). In addition, S participants

reported greater interference from pain (S M=10.45; US M=10.13), greater distress (S

M=7.86; US M=7.02), and higher levels of depression (S M=23.78; US M=19.46) and

anxiety (S M=18.50; US M=15.87). Significance was approached in number of ER

visits, $t(282.290)$=-1.581, p=.115. Pearson correlations found the following variables to

be highly correlated: MPI Interference and Distress (r=.355), MPI Interference and BDI-

II (r=.393), MPI Interference and perceived physical health (r=-.477), MPI Distress and

Control (r=-.448), MPI Distress and BDI-II (r=.595), MPI Distress and BAI (r=.517),

MPI Control and BDI-II (r=-.408), MPI Control and BAI (r=-.394), BDI-II and BAI

(r=.608), BDI-II and perceived physical health (r=-.345), and BAI and perceived physical

health (r=-.345). Based on these correlations, as well as the strength of the relationships

with the criterion variables, MPI Interference and Distress, BDI-II, and BAI were

excluded as potential predictors. All other variables were entered as potential predictors

into the forward binary logistic regression. In addition, race and insurance type were

included due to the demographic analysis.

Forward Binary Logistic Regression

A forward binary logistic regression was conducted to evaluate predictors of

success in COP graduates, as defined by success in three areas. The Wald Ratios were

not significant for Worker's Compensation, β=-1.304, $\chi^2(1)$=1.334, p=.248; commercial

insurance, β=-.635, $\chi^2(1)$=.324, p=.569; Medicare insurance, β=-.387, $\chi^2(1)$=.124, p=.725;

and "other" insurance, β=-.089, $\chi^2(1)$=.006, p=.936 (see Table 24). Significant Wald

Ratios were obtained for number of surgeries in the twelve months prior to treatment, β=-.162, $\chi^2(1)$=8.407, p=.004; MPI Control, β=-.176, $\chi^2(1)$=15.949, p<.001; and perceived physical health, β=-.049, $\chi^2(1)$=6.097, p=.014 (see Table 25). Odds ratios for Worker's Compensation (OR=.271; CI .030 to 2.481), commercial insurance (OR=.530; CI .059 to 4.723), Medicare (OR=.679; CI .079 to 5.850), and "other" insurance (OR= .915; CI .103 to 8.112) revealed confidence intervals which overlapped. This overlap indicated that the likelihood of a type I error is high; thus, no statements regarding the predictive value of these variables can be made. Significant odds ratios were obtained for number of surgeries (OR=.850; CI .669 to .915), MPI Control (OR=.838; CI to), and perceived physical health (OR=.952; CI 1.166 to 1.476). These results indicated that for each surgery over the twelve months prior to treatment, the chance of not displaying success in three or more areas increased by 17.6%. Furthermore, with each one point decrease in pre-treatment perceived control, the chance of not showing success in three or more areas increased by 19.3%; and for each one point decrease in perceived physical health, chances of not showing success in three or more areas was increased by 5%. Utilizing insurance type, number of surgeries, MPI Control, and perceived physical health, this model correctly classified 74.7% of COP graduates.

Focused Interdisciplinary Treatment

Identifying Potential Predictor Variables

For FIT graduates, independent samples t-tests (see Table 23) revealed significant differences between S and US participants in MPI Control, $t(218)$=-1.911, p=.007; with S participants reporting less control at pre-treatment (M=7.05) than US

participants (M=7.98). Significance was approached in BDI-II, $t(218)=-1.911$, $p=.057$. Pearson correlations revealed significant correlations between these two variables ($r=-.395$). A forward binary logistic regression was conducted which included MPI Control and BDI-II as potential predictors. In addition, race and insurance type were entered as potential predictors based on the findings from the demographic analysis.

Forward Binary Logistic Regression

For FIT graduates, a forward binary logistic regression revealed a significant Wald Ratio for MPI Control, $\beta=-.146$, $\chi^2(1)=6.992$, $p=.008$ (see Table 24); BDI-II was excluded from the statistical model. Analysis revealed an odds ratio of .864 (CI .775 to .963) for MPI Control. This indicated that for each one point decrease in pre-treatment MPI Control scores, chances of displaying success in three or more areas increased by 15.7%. Utilizing MPI Control, this model correctly classified 60.0% of FIT graduates.

Summary of Predictors of Success in Three Areas

In summary, analyses of success in three areas revealed various predictors of success (see Table 24). Success was defined as meeting criteria for success in at least three out of the five areas. For the overall sample, fewer surgeries in the twelve months prior to treatment and lower perceived control at pre-treatment were predictive of success. For the COP sample fewer surgeries in the twelve months prior to treatment, lower perceived control, and lower perceived physical health at pre-treatment were predictive of success. Insurance type was also included in the statistical model, but was

not statistically significant. For the FIT program, lower perceived control at pre-treatment was predictive of success.

Predictors of Success in All Five Areas

Individuals meeting criteria for success in all five areas were classified as "successful" and those meeting criteria in two or fewer areas as "unsuccessful" for the analyses to follow.

Overall Sample

Identifying Potential Predictor Variables

For the overall sample of graduates, independent samples t-tests (see Table 25) revealed significant differences between S and US participants in hours resting, $t(742)=-2.645$, $p=.008$, MPI Pain, $t(169.954)=-3.235$, $p=.001$, MPI Interference, $t(187.699)=-4.497$, $p<.001$, MPI Distress, $t(156.166)=-2.710$, $p=.007$, MPI Control, $t(185.876)=7.680$, $p<.001$, BDI-II, $t(165.194)=-3.821$, $p<.001$, BAI, $t(749)=-3.036$, $p=.002$, and perceived physical health, $t(177.536)=3.296$, $p=.001$. S participants reported a greater number of hours resting (M=6.07) compared to US participants (M=5.23), and higher levels of pain (S M=9.07; US M=8.48), interference (S M=10.63; US M=9.75), distress (S M=7.89; US M=7.09), depression (S M=23.90; US M=20.34), and anxiety (S M=19.64; US M=16.00). In addition, S participants reported lower perceived physical health (S M=23.50; US M=25.20), and lower levels of control (S M=5.27; US M=6.86). Pearson correlations found the following variables to be highly correlated: Rest and MPI Interference ($r=.353$), rest and perceived physical health ($r=-.344$), MPI Pain and

Interference (r=.376), MPI Pain and MPI Distress (r=.401), MPI Pain and perceived

physical health (r=-314), MPI Interference and Distress (r=.355), MPI Interference and

BDI-II (r=.393), MPI Interference and perceived physical health (r=-.477), MPI Distress

and Control (r=-.448), MPI Distress and BDI-II (r=.595), MPI Distress and BAI

(r=.517),   MPI Control and BDI-II (r=-.408), MPI Control and BAI (r=-.394), BDI-II

and BAI (r=.608), BDI-II and perceived physical health (r=-.345), and BAI and

perceived physical health (r=-.345). A forward binary logistic regression was run with

all of the above variables entered as potential predictors. In addition, race and insurance

type were included due to the demographic analysis.

Forward Binary Logistic Regression

For the overall sample of graduates, a forward binary logistic regression revealed

significant Wald Ratios for MPI Interference, β=.155, $\chi^2(1)$=7.429, p=.006; and MPI

Control, β=-.262, $\chi^2(1)$=31.685, p<.001 (see Table 26); all other variables were excluded

from the statistical model. The Wald Ratios were not significant for Worker's

Compensation, β=-1.690, $\chi^2(1)$=1.686, p=.194, commercial insurance, β=.233,

$\chi^2(1)$=.044, p=.835, Medicare insurance, β=.424, $\chi^2(1)$=.153, p=.696, and "other"

insurance, β=.512, $\chi^2(1)$=.219, p=.640. Analysis revealed an odds ratio of .185 (CI .014

to 2.365) for Worker's Compensation, 1.263 (CI .141 to 11.290) for commercial

insurance, 1.528 (CI .182 to 12.821) for Medicare, 1.669 (CI .195 to14.295) for "other"

insurance, and an odds ratio of 1.168 (CI 1.044 to 1.305) for MPI Interference and .769

for MPI Control (CI .702 to .843). These results indicated that the odds of not showing

improvement in all five areas was higher for those with who had Worker's Compensation

as their primary insurance, but the finding was not statistically significant. Furthermore,

this model indicated that for each one point increase in MPI Interference, chances of

being successful, as defined by showing success in all five areas, increased by 16.8%;

and for every one point decrease in initial MPI Control scores, chances of being

successful increased by 30%. Utilizing insurance type, MPI Interference, and MPI

Control, this model correctly classified 85.5% of graduates in the overall sample; this

classification ability did not exceed the classification ability of the constant (i.e.,the

model was no better than chance).

Comprehensive Outpatient Program

   Identifying Potential Predictor Variables

   For COP graduates, independent samples t-tests (see Table 25) revealed

significant differences between S and US participants in MPI Control, $t(203.392)=4.960$,

$p<.001$; with S participants reporting less perceived control over their pain at pre-

treatment (M=5.35) than US participants (M=6.45). Significance was approached for

MPI Pain, $t(530)=-1.417$, $p=.157$, MPI Interference, $t(174.504)=-1.537$, $p=.126$, and BDI-

II, $t(174.633)=-1.679$, $p=.095$. Pearson correlations found no correlation above $r=.300$

among these variables. None of the variables were correlated above the predetermined

cut-off of r=.30. A forward binary logistic regression was run with all of the above

variables entered as potential predictors. In addition, race and insurance type were

included in the forward binary logistic regression due to the demographic analysis.

Forward Binary Logistic Regression

For COP graduates, a forward binary logistic regression revealed significant Wald Ratios for MPI Control, β=-.212, $\chi^2(1)$=18.744, *p*<.001 (see Table 26); all other variables, other than insurance type, were excluded from the statistical model. The Wald Ratios were not significant for Worker's Compensation, β=-1.561, $\chi^2(1)$=1.444, *p*=.229; commercial insurance, β=.251, $\chi^2(1)$=.050, *p*=.823; Medicare insurance, β=.673, $\chi^2(1)$=.383, *p*=.536; and "other" insurance, β=.856, $\chi^2(1)$=.608, *p*=.436 (see Table 25). Analysis revealed an odds ratio of .210 (CI .016 to 2.678) for Worker's Compensation, 1.285 (CI .144 to 11.505) for commercial insurance, 1.960 (CI .233 to 16.511) for Medicare, 1.669 (CI .273 to 20.288) for "other" insurance, and an odds ratio of .809 (CI .735 to .890) for MPI Control. These results indicated that the odds of not displaying improvement in all five areas was higher for those with who had Worker's Compensation as their primary insurance but the finding was not statistically significant. Additionally, this model indicated that for each one point decrease in MPI Control scores at pre-treatment, chances of showing improvements in all five areas increased by 23.6%. Utilizing insurance type and MPI Control, this model correctly classified 81.1% of COP graduates; this classification ability did not exceed the classification ability of the constant (i.e., the model was no better than chance).

Focused Interdisciplinary Treatment

Identifying Potential Predictor Variables

For FIT graduates, independent samples t-tests (see Table 25) revealed significant differences between S and US participants in MPI Interference, *t*(218)=-2.078,

p=.039; MPI Distress, t(218)=-2.105, p=.036; and MPI Control, t(218)=3.713, p<.001.

Compared to US participants, S participants reported greater levels of interference (S

M=10.86; US M=8.64) and distress (S M=8.71; US M=6.09), and lower levels of control

(S M=4.14; US M=7.86). Significance was approached in BDI-II, t(218)=-1.827,

p=.069; BAI, t(6.155)=-2.142, p=.075; and walking performance, t(105)=-1.481, p=.142.

Pearson correlations were conducted to analyze correlations between these variables.

Analysis revealed correlations above the pre-determined cut-off of r=.300 among the

following variables: MPI Interference and MPI Distress (r=.352), MPI Interference and

BDI-II (r=.426), MPI Interference and BAI (r=.344), MPI Distress and MPI Control (r=-

.481), MPI Distress and BDI-II (r=.589), MPI Distress and BAI (r=.528), MPI Control

and BDI-II (r=-.395), MPI Control and BAI (r=-.389), and BDI-II and BAI (r=.533). A

forward binary logistic regression was run with all of the above variables entered as

potential predictors. In addition, race and insurance type were included due to the

demographic analysis.

Forward Binary Logistic Regression

For FIT graduates, a forward binary logistic regression revealed significant Wald

Ratios for MPI Interference, β=.632, χ^2(1)=4.200, p=.040; MPI Control, β=-1.124,

χ^2(1)=7.920, p=.005; and walking performance, β=.286, χ^2(1)=5.455, p=.020 (see Table

26); all other variables were excluded from the statistical model. Analysis revealed an

odds ratio of 1.881 (CI 1.028 to 3.443) for MPI Interference, an odds ratio of .325 (CI

.149 to0.711) for MPI Control, and 1.332 (CI 1.047 to 1.693) for walking performance.

These results indicated that for each one point increase in MPI Interference scores at pre-

treatment, chances of showing improvement in all five areas increased by 88.1%.

Additionally, for every one point decrease in pre-treatment MPI Control scores, chances

of showing improvements in all five areas increased by 307%, and for each additional lap

walked at pre-treatment, chances of showing success in all five areas increased by 33.2%.

Utilizing MPI Interference, MPI Control, and walking performance, this model correctly

classified 96.3% of FIT graduates.

Summary of Predictors of Success in all Five Areas

In summary, analyses revealed various predictors of success (see Table 26).

Overall success was defined for these analyses as meeting criteria for success in all five

areas. For the overall sample, higher reported interference from pain and lower perceived

control at pre-treatment were predictive of success. Insurance type was also included in

the statistical model, but was not statistically significant. For the COP sample, lower

perceived control at pre-treatment was predictive of success. Insurance type was also

included in the statistical model, but was not statistically significant. For the FIT

program, higher reported interference, lower perceived control, and lower walking ability

at pre-treatment were predictive of success.

Identifying Relevant Pre-Treatment Variables and Appropriate Cut Scores

Relevant pre-treatment variables and potential cut points to assist clinicians in

determining the most appropriate treatment intensity were examined (i.e., hours resting,

MPI Pain, MPI Interference, MPI Distress, BDI-II, and walking performance). Variables

of interest were selected based on differences between those who were successful and

those who were not on pre-treatment scores, as well as the predictors from previous

analyses.

MPI Interference, MPI Distress, BDI-II, and walking performance did not yield

useful cut-points, as the proportion of successful to unsuccessful individuals in the COP

and FIT programs were no different than the entire sample. However, for hours resting,

significant differences existed between COP and FIT (see Table 27). For those

individuals resting seven or more hours per day at pre-treatment, the chi-square analysis

was significant, and the difference between COP and FIT was greater than that seen for

the overall group of graduates, $\chi^2(1, N=244)=22.216$, $p<.001$; with 71.8% of COP

participants resting more than seven hours per day meeting criteria for success compared

to 29.0% of FIT participants . Similarly, looking at pre-treatment reported pain, a chi-

square analysis revealed significant differences in success rates between COP and FIT,

$\chi^2(1, N=690)=57.137$, $p<.001$ (see Table 28). For those individuals entering treatment

with reported pain levels of six or greater (on a scale of 0-12), 72.0% of COP participants

were successful compared to 40.7% of FIT participants. This difference between the

success rates of the two treatment groups was greater than that seen for the overall

sample of graduates.

Analysis of New Definitions of Success

Success was redefined for BDI-II, walking, pain, and control to account for

individuals who began treatment in a clinically successful range; e.g., a BDI-II score in

the minimally depressed range. Therefore, significant improvement in BDI-II scores was

redefined as a 20% decrease in BDI-II scores from pre- to post-treatment *or* a BDI-II of

13 or lower (minimally depressed) at post-treatment. Success in walking was redefined as a 20% increase in walking ability from pre- to post-treatment *or* ability to walk fifteen or greater laps at post-treatment. In the area of pain severity, success was redefined as a 20% decrease in pain severity *or* a reported pain level of six or less at post-treatment. In terms of reported control over pain, success was redefined as a 20% increase in sense of control *or* a post-treatment rating of 10 or greater on MPI Control.

Based on these new definitions, COP and FIT were re-compared to identify differences in rates of success utilizing the criterion of successful improvement in three or more areas. Chi-square analysis revealed significant differences between the two groups, $\chi^2(1, N=757)=28.340$, *p*<.001 (see Table 29). After examining the hours resting cut-point (i.e., resting 7 or more hours), significant differences were revealed among the two groups in a sample containing individuals entering treatment who reported resting seven or more hours per day, $\chi^2(1, N=244)=21.459$, *p*<.001 (Table 29). For individuals reporting pain severity of six or greater at pre-treatment, significant differences were noted between the two groups, $\chi^2(1, N=690)=37.420$, *p*<.001 (see Table 29).

CHAPTER EIGHT
Conclusions and Recommendations

DISCUSSION

Demographics of the Entire Sample

Statistically significant differences were found among the three groups on the demographic variables of age, race, insurance type, and marital status (Table 3). Based on the findings, race and insurance type were entered as potential predictors of graduation in subsequent analyses utilizing the entire sample of participants. The COP group had more African-American and less White participants than the other two groups, which is more reflective of the population in Dallas County. Differences in the racial make-up were likely due the geographic location of the Dallas clinic, as compared to the outlying areas of Richardson (MCOP) and Grapevine (a portion of FIT). The COP program serves a greater proportion of participants (15.6%) with worker's compensation listed as their primary payer than the other two programs, with 5.0% of FIT participants and 0% of MCOP participants utilizing worker's compensation benefits. Additionally, MCOP served significantly more individuals with commercial insurance (77.0%) than FIT and COP (65.6% and 47.8%, respectively). These differences likely mirror the demographic differences seen among the sites, with those seeking services at MCOP being more likely to be employed and having a higher SES. Insurance type and race were included in subsequent analyses to control for differences among the programs; insurance type was included in some of the statistical models, as described below.

The demographic variables of age and marital status were not utilized as potential predictors, as the differences among the three treatment groups were deemed to be of

little importance. The mean age among the three programs were statistically, but not

clinically different; all differences among means were less than three years. In terms of

marital status, it was decided to exclude this demographic variable in further analyses.

Differences in marital status were statistically significant among the groups. However, it

appeared to have little clinical relevance. A brief investigational analysis was conducted

which included marital status in some of the analyses related to graduation and, as

expected, marital status was not significant and was excluded from all of the statistical

models.

Demographics of Graduates Only

Demographic variables of graduates only, excluding non-graduates, were similar

to those for the overall sample (see Table 5); namely, statistical differences were noted in

race and insurance type. The hypothesized reasons for these findings are similar for this

smaller sample of individuals to those for the entire sample. Once again, the differences

seen in insurance type and racial composition are likely directly influenced by the

different geographical locations of the clinics. Also, MCOP is not recognized as a

specialized clinic for those with worker's compensation injuries and many of the

worker's compensation participants in COP engaged in treatment prior to relatively

recent changes in the worker's compensation statutes.

Although statistically significant differences existed between the mean ages of

COP and FIT participants, this finding appeared clinically irrelevant, as the difference

between the means was less than four years. Contrary to findings with the entire sample

including both graduates and non-graduates, marital status was not statistically different

among the treatment programs when only graduates were included in the samples.

Looking at distribution of marital status for the graduate sample in comparison to the

overall sample, distributions in FIT and COP were relatively the same, differing by less

than one percent in each of the categories. For MCOP, there were more married

individuals and less divorced individuals than in the overall sample, but the difference

was statistically non-significant. Furthermore, the actual numerical difference was small.

Based on the findings, race and insurance type were entered as potential predictors in

subsequent analyses.

Hypothesis A: Predictors of Graduation for the Overall Sample

It was hypothesized that levels of affective distress and health care utilization

would predict significant rates of non-completion in the overall sample. Specifically,

participants who reported higher degrees of affective distress and greater health care

utilization at pre-treatment would be less likely to graduate. Findings from the analyses

were similar to those found in a previous investigation (Oslund, Robinson, Clark, Noe, &

Garofalo, 2008) and supported the hypothesis. Both BAI and ER visits were significant

predictors of non-completion (see Table 7). This indicates that high anxiety at the

beginning of treatment increases the likelihood of prematurely terminating treatment.

This may reflect an inability to bind anxiety which interferes with the recognition of the

progress that has been made. Number of ER visits may speak to the coping mechanisms

and thought processes of individuals who frequently visit the ER. Using the pain beliefs

theory to understand these findings, it can be hypothesized that these individuals engage

in catastrophizing, which leads to the belief that their pain is severe enough to warrant

enduring long waits and high costs associated with receiving treatment at the ER. The four weeks of treatment may be too long and intolerable for these individuals who are seeking "immediate" results. For those with high anxiety, they may interpret any "hurt" they feel during treatment (i.e. during physical therapy activities) as "harm," and thus be afraid to fully engage in treatment.

Hypothesis B: Predictors of Graduation for Each of the Treatment Programs

The findings of Hypothesis B partially support the hypothesis that affective distress and health care utilization will account for different degrees of variance in graduation rates among FIT, MCOP, and COP (see Table 9). Health care utilization was a significant predictor of graduation for both the COP and FIT programs, but not for the MCOP program. Namely, greater number of visits to the ER in the twelve months prior to treatment was predictive of non-completion. The predictive power varied among the COP and FIT programs, with ER visits over the twelve months prior to treatment accounting for only 17.6% of the variance for COP graduates compared to 31.6% of the variance for FIT graduates. This difference may be a sign that lower frequency and intensity of treatment (FIT) may be less effective than a more intense program (COP) in alleviating the pressure patients feel to seek treatment for their pain. Another possible explanation is that this finding reflects differences in prototypical patients for each group. That is, those who are assigned to and enter COP are individuals who have greater dysfunction from their pain than those entering FIT. In terms of the mean number of ER

visits, individuals entering COP have higher mean ER visits (M=1.40) than those entering FIT (M=0.86).

Affective distress, as measured by the BAI was a significant predictor of graduation from COP; affective distress, as measured by the MPI Distress scale, was a significant predictor of graduation from FIT. The MPI Distress scale was highly correlated with the BAI in the FIT sample (*r*=.550), which suggests that the two variables are measuring a similar construct. The MPI Distress scale was a more robust variable for the FIT program, while the BAI was more robust for COP. Thus, these findings support the hypothesized impact of affective distress on graduation. The difference in impact of affective distress (3% for COP and 10% for FIT) may again be related to the greater frequency and intensity of treatment in COP. FIT appears less effective at minimizing the impact of affective distress on graduation when compared to COP. Another explanation is that those in FIT begin the program with less anxiety. Looking at mean pre-treatment BAI scores, the two groups differed significantly, with those entering FIT reporting lower anxiety (M=14.36) than those entering COP (M=18.70). We expect that the average COP patient may be more disabled and thus more anxious and fearful of their pain and the potential consequences of pain. These anxieties and fears may be more chronic than in the FIT program. Those with more chronic anxiety may be better able to manage their emotions during treatment. Contrary to what was originally hypothesized, affective distress was not a significant predictor of graduation from the MCOP program. This finding may be an artifact of the small sample size for this program. However, it may also speak to the type of patient who enters MCOP.

Looking at the distribution of BAI scores, almost 40% of COP participants had scores between 17 and 34; for FIT, more than 60% of the scores fell between 3 and 17; and for MCOP, the distribution of scores were evenly spread, and no cluster in any particular range was identified. Thus, it may be that those entering MCOP are much more heterogeneous, which results in minute differences between graduates and non-graduates and consequently does not allow for a strong predictor to emerge.

Interestingly, the number of hours resting per day at pre-treatment was a significant predictor of graduation for both MCOP and FIT, but not for COP. Mean hours resting were significantly lower for FIT (M=4.22) and MCOP (M=4.75) than for COP (M=6.01). One hypothesized reason for hours resting having such an impact may be the thinking that goes along with resting. Those who experience pain with movement may interpret this sensation as "harmful" and thus rest as a means to avoid harm and ultimately activity. Patients attending less frequent and less intensive programs may find it easier to engage in resting, as they have more "off" hours from treatment, which consequently feeds into their beliefs and behaviors. Engagement in a more intense program (COP), may prevent patients from engaging in such thinking and behaviors, and thus reduce the impact that resting has on completion of treatment.

Regardless of hours resting, COP appears to be of sufficient intensity to overcome fear and avoidance behavior. In addition, the intensity of COP may enhance individual's feelings of self-efficacy and control. More specifically, as self-efficacy and perceived control over pain increases, the perception of resting may decrease. This feeling may be a reflection of actual changes in hours resting or the original perception of the number of hours resting may not be based in reality. A person's belief system may

change from, "I cannot do anything, because of my pain" to, "I can do many things, despite my pain." As control increases, the reality of how much an individual is resting may become more apparent to them. This notion of self-efficacy and control will be explored later.

Hypothesis C1: Predictors of Success as Self-Reported Improvement

It was hypothesized that participants with high degrees of self-efficacy (MPI Control) and lower levels of affective distress (as measured by BDI-II, BAI, and/or MPI Distress) would rate themselves as improved. Neither of these constructs were significant.

For the overall sample, impact of pain on engagement in social and recreational activities (MPI Interference) was predictive of participants rating themselves as not improved. This likely speaks to the perception that interference in engaging in such activities is of primary importance in perception of well-being. Thus, these individuals may have difficulty looking at the big picture, and do not perceive changes in other areas as improvement.

For COP participants, lower interference was not predictive of self-reports of improvement. Instead, older age was a significant predictor of success. This finding may be reflective of older individuals accepting limitations and difficulties more so than younger individuals. Thus, older individuals may be more likely to view even minor changes in well-being as important, and thus report that they have improved.

For MCOP participants, pain's interference in activities was a significant predictor of failure to rate oneself as improved. Again, this may speak to the importance

placed on social and recreational functioning, and thus if interference in these areas is not reduced, individuals are less likely to rate themselves as improved. For FIT participants, self reported pain prior to treatment significantly predicted self-reports of lack of improvement. Thus, those with high amounts of pain may be unable to engage fully in treatment and pain may prevent them from interpreting other improvements as important. Furthermore, FIT participants are typically functioning adequately in many areas of their life, or they would have been referred to COP or MCOP. FIT participants may focus primarily on pain as they do not need to make substantial improvements in their daily functioning or mood.

Although the hypothesized factors that we predicted would influence perception of success were not significant, it is important to look at the actual numbers of individuals reporting the varying degrees of improvement. Success was defined as rating oneself as "very much improved" or "much improved," as recommended by the IMMPACT committee (Dworkin, Turk, Wyrich, Beaton, Cleeland, Farrar, et al., 2008). Thus, participants rating them self as "minimally improved," "no change," "minimally worse," "much worse," and "very much worse" were considered unsuccessful. It may be that even minimal improvement is perceived as "success" in the patients' eyes and thus should not be considered "unsuccessful." However, if this response was eliminated from the analysis, the number of individuals rating themselves as unsuccessful would be too small for statistical analyses to be conducted.

None of the participants who graduated from any of the three treatment programs reported themselves as "very much worse." Only 14 of the 563 individuals reported having no change (six in COP and eight in FIT), nine reported that they were minimally

worse (two in COP, one in MCOP , and six in FIT), and only one individual (from COP) reported being much worse following treatment. Looking at percentage of individuals reporting themselves as unchanged or worse only 4.3% of participants in the overall sample did so, 2.8% did in COP, 2.4% did in MCOP, and 7% did in FIT. Because these percentages are miniscule, it may be that individuals reporting no change in overall functioning or decreased functioning are an anomaly or the group is too small for statistical analysis to pick up significant differences.

Hypothesis C2: Predictors of Success as Decrease in Depression

It was hypothesized that individuals with higher levels of activity at baseline would be more likely to experience decreases in reported depression on the BDI-II, which was not supported by the analyses. In fact, in MCOP, *lower* activity level at treatment initiation was predictive of success. BDI-II was a significant predictor of success, as measured by a 20% decrease in BDI-II scores, for all samples investigated. No other pattern was revealed in the analyses.

Interestingly, those who displayed significant decreases in depression had higher initial BDI-II scores than those who were unsuccessful. This could speak to the inherent association between the initial BDI-II scores and the criterion variable of BDI-II change scores. It could also speak to the tendency of regression toward the mean, with those reporting higher initial depression naturally moving back back toward lower levels. A closer examination of the range of scores of those who were successful as opposed to those who were unsuccessful revealed that a much higher percentage of participants who were considered "unsuccessful" due to the criteria had BDI-II scores in the range of

minimal to no depression. Specifically, for the entire sample 48.5% of unsuccessful participants fell into the minimal depression range at pre-treatment compared to 15.4% in the successful group. In COP, 38% of the unsuccessful participants fell in the range of minimal to no depression, compared to only 12.8% of the successful individuals. For minimal depression scores in MCOP, the difference in percentage between the successful and unsuccessful individuals was 20% and 46.2%, respectively. In FIT, 24.1% of individuals considered successful reported minimal to no depression, compared to 59.1% of the unsuccessful participants. Thus, for many of those who were classified as "unsuccessful" due to a less than 20% decrease in depression scores, initial levels of depression were not clinically significant. This suggests that a decrease in BDI-II scores was not essential to the wellbeing of this group. These findings regarding levels of depression in the unsuccessful group speak to the need to reconsider how we define success.

Another hypothesis suggested by this data is that participants who are endorsing greater amounts of depression at treatment initiation are receiving interventions specifically aimed at decreasing these symptoms. Treatment providers may recognize the impact of depression on the individual's pain at treatment entry and thus, focus their interventions on decreasing these symptoms. For those with lower BDI-II scores, clinically significant symptoms of depression were often not present, and thus was not necessary to overtly address it.

For the overall sample, when BDI-II was excluded as a potential predictor, emotional distress, as measured by the MPI Distress scale, was found to be a significant predictor of decreased depressive symptoms. Consistent with previous findings, those

who were unsuccessful had lower initial MPI Distress scores. As BDI-II and MPI Distress were highly correlated (r=.586), which suggests that for those considered "unsuccessful," emotional distress may not be a significant issue.

For the COP program, BAI was a significant predictor when BDI-II was excluded. Specifically, the higher the initial BAI score, the more likely the person would display a significant decrease on the BDI-II. As with the MPI Distress scale in the overall sample, BAI and BDI-II were highly correlated (r=.608). Those who had higher BAI scores at treatment onset were more likely to be considered successful. Once again, this may be reflective of a greater proportion of "unsuccessful" participants presenting with little to no emotional distress, suggesting that this domain may be irrelevant to them.

For the MCOP program, the number of physician visits during the twelve months prior to treatment and pre-treatment standing performance were significant predictors in the model, which also utilized BDI-II as a predictor. That is, as the number of physician visits increased and standing performance increased, the likelihood of being unsuccessful chances of achieving a significant reduction in depression decreased. Greater number of physician visits may be indicative of a strong need for pain to be acknowledged as a "physiological" phenomenon. Consequently, when individuals who frequently visit their doctor enter a treatment program that focuses primarily on psychosocial factors they may be unwilling to acknowledge these non-physiological factors. As a result, these individuals are likely unable to fully engage in treatment. Frequent interactions with their medical doctor may further contribute to this belief that their pain is physiological and enhance the denial of psychosocial factors.

Standing performance, as measured by the number of sit to stand repetitions in one minute, remained predictive of a significant decrease in depression when BDI-II scores were removed as a potential predictor in the MCOP graduates. Interestingly, those who performed better during their initial physical therapy evaluation in the area of ability to stand up, were more likely to be classified as unsuccessful. One hypothesis to explain this finding could be that participants who are able to perform relatively better in physical therapy initially are not as depressed, and thus do not require a large decrease in depression during treatment. Individuals with higher levels of depression may have greater deconditioning due to lack of energy and apathy. As a result, a lowered ability to engage in physical therapy may be reflective of individuals who are in greater need of addressing symptoms of depression.

In the FIT program, diagnostic procedures and BDI-II scores were significant predictors of significant decreases in levels of depressive symptoms. Number of diagnostic procedures prior to treatment entry remained a significant predictor when BDI-II scores were removed from the analysis. Similar to the hypothesis regarding physician visits in MCOP, it can be hypothesized that individuals who undergo diagnostic procedures such as MRIs, which are often expensive, are highly entrenched in the belief that their pain is "physiological" in nature. When they enter the interdisciplinary treatment program, in which psychosocial factors are of primary focus, they may find it difficult to acknowledge the contribution of these factors to their difficulties. Consequently, they may be unable to fully engage in treatment. From the traditional medical model, some would argue that these individuals' pain conditions are

more physiological in nature; however, this argument would not be supported within a biopsychosocial theoretical framework.

BDI-II was used as a potential predictor in initial analyses as a means to control for pre-treatment levels and was expected to be a significant predictor. The emergence of predictors in addition to BDI-II indicates that the differences between S and US participants include more than just depression. Overall, these findings suggest that individuals with higher activity level at pre-treatment, as measured by number of sit to stand repetitions in one minute, may not need a more intense program to address their emotional distress as measured by the BDI-II. In contrast, individuals who are frequent health care users may need the most intensive program to address their beliefs that their pain is solely "physiological" and allow them adequate time to begin to acknowledge the psychosocial factors contributing to their difficulties.

When changes in BDI-II scores were examined across time, while controlling for pre-treatment BDI-II scores, a significant interaction existed between change across time and treatment program type. Although improvement was noted in all programs, the amount of improvement among the programs was variable. Looking at comparisons of the groups, the FIT group did not show as much improvement as the two more intensive groups. The MCOP group showed significantly more change over time than the FIT group; and COP showed an even greater amount of change than FIT. Thus, although all of the programs are effective in producing decreases in depression, the more intensive programs are going to be the most helpful in this domain.

Hypothesis C3: Predictors of Success as Increased Walking Ability

Predictors of success were analyzed for the overall sample and each of the three separate treatment programs. Originally, success in this condition was defined as an increase from pre- to post-treatment of at least 20% in number of laps walked in five minutes. It was hypothesized that individuals with higher degrees of self-efficacy (as measured by MPI Control) and lower levels of perceived physical dysfunction (as measured by SF-12 Physical Health scale) would be more likely to be successful. Neither of these variables were significant predictors for the overall sample nor for any of the treatment groups.

For the overall sample, as well as each of the treatment programs, walking performance at pre-treatment was entered as a potential predictor. Secondary analyses excluded initial walking performance as a predictor, as this score was used to calculate the change scores utilized for classification of success. For the overall sample, initial analyses revealed that pre-treatment BDI-II scores and initial walking performance were significant predictors of success. Those with lower initial BDI-II scores and those with higher initial walking performance were less likely show improvement in physical functioning. When walking performance was removed from the analysis, MPI Distress scores and standing scores were significant predictors of success. MPI Distress was highly correlated with BDI-II, and thus assessed a similar construct. Thus, it appears that lower physical ability and greater emotional distress are significant predictors of improved physical functioning, regardless of how emotional distress is measured.

These findings may be clinically irrelevant, as independent t-tests comparing "successful" and "unsuccessful" participants in the domain of increased walking ability

revealed a statistically, but not necessarily clinically significant difference between mean post-treatment walk scores for the two groups. Those who were "successful" walked an average of 21.68 laps, while those who were "unsuccessful" walked an average of 19.94 laps.

It is likely that those who were classified as "unsuccessful" were functioning physically at fairly high level prior to treatment (M=18.85). Consequently measuring "success" in terms of increase in walking for these individuals may not be the most effective model. Further, increases in physical ability for successful individuals may be an artifact of regression toward the mean, as their initial walking abilities were low. It is important to keep in mind that these analyses are still useful. It provides information about individuals who are physically deconditioned. Specifically, pain programs are useful in increasing physical abilities for those who are physically deconditioned, as well as emotionally distressed. It is likely that these programs are not only directly addressing the physical limitations through increasing activity, but also the psychological variables that may serve to keep these individuals inactive. Specifically, emotional distress and fear of activity are likely significant contributors to the inactivity. Emotional distress can lead to apathy and decreased energy, which could heavily impact physical activity. Additionally, individuals who view their pain as "harmful" will likely begin to fear this pain. Thus, they become increasingly inactive in order to avoid pain.

For the COP sample, BDI-II and walking performance were significant predictors of successful increases in walking ability. Specifically, those with higher BDI-II scores at pre-treatment and those with lower levels of physical ability were more likely to show improvement in physical functioning. When pre-treatment walking performance

was removed from the analysis, standing remained a significant predictor. Once again, these findings may be clinically irrelevant, despite the statistically significant findings, as post-treatment walking performance of the two groups were near identical. There was slightly more than a one lap difference among the post-treatment means of the "successful" and "unsuccessful" participants (M=22.02, M=20.85, respectively).

For the MCOP sample, no significant predictors of "success" were identified. This is easily explained by the lack of significant differences among "successful" and "unsuccessful" participants on both pre- and post-treatment walking performance. Interestingly, the largest difference among successful and unsuccessful participants' post-treatment walking performance means (M=19.62, M=16,42, respectively) was seen in MCOP; however, the difference was not statistically significant.

For the FIT sample, walking performance was a significant predictor of successful increases in walking. When walking performance was not utilized, standing performance was significant. Individuals who had lower physical stamina and endurance were more likely to increase their walking performance by 20% from pre- to post-treatment. Comparing the two groups on post-treatment walking performance, the difference between the means of the two groups was not statistically significant (p=.498). Those who were considered "successful" walked an average of 19.79 laps, while those who were "unsuccessful" walked an average of 18.92 laps. Thus, the findings regarding predictors of success in FIT, as with the other samples, indicates that those who are physically deconditioned will improve their physical abilities over the course of treatment.

The criterion used for classifying individuals as "successful" versus "unsuccessful" in terms of physical abilities was selected based on criterion proposed by the IMMPACT consensus statement (Dworkin, Turk, Wyrich, Beaton, Cleeland, Farrar, et al., 2008). The findings of this study speak to the fact that we still have not perfected the methods for quantifying success. A second criterion was employed for defining success, in which individuals walking 15 or more laps at post-treatment were considered successful and those walking 14 or less laps were considered unsuccessful.

It was again hypothesized that individuals with higher degrees of self-efficacy (as measured by MPI Control) and lower levels of perceived physical dysfunction (as measured by SF-12 Physical Health scale) would be more likely to be successful. Neither of these variables were significant predictors for the overall sample nor for any of the individual treatment groups.

Pre-treatment walking performance was a significant predictor for the overall sample, as well as the individual treatment programs. However, in contrast to the previous method of quantifying success, *higher* walking performance was predictive of walking 15 or more laps at post-treatment. This is likely an artifact of the classification method. Many of the individuals being classified as "successful" were already functioning at a level prior to treatment that was commensurate with being classified as successful at post-treatment. When walking was removed as a potential predictor, higher pre-treatment standing performance was predictive of walking 15 or more laps at post-treatment in all of the samples except MCOP. Younger age was a significant predictor of success, as defined by walking 15 or more laps at post-treatment, for the overall and COP samples, first with walking and then with standing. No other predictors of success, other

than walking, were identified for MCOP. For FIT, age was a significant predictor in addition to greater physical ability.

These findings likely reflect two possibilities. First, individuals who are performing at a higher physical level at pre-treatment will continue to do so over the course of treatment. For those with lower physical abilities, treatment may be insufficient for increasing activity to an optimal level. Second, age may be reflective of deconditioning that occurs as part of the normal aging process. The lack of predictors beyond walking in MCOP is likely a reflection of the small sample size.

Comparing changes in walking ability across the programs, it was revealed that treatment produced significant changes over time. Although all programs produced significant increases in walking ability, COP produced the largest increase in physical ability; FIT produced the smallest increase in walking ability. These findings speak to the effectiveness of interdisciplinary pain programs in increasing mobility, regardless of treatment intensity. However, maximum benefit, regardless of initial physical abilities, will be seen in the most intensive program.

Hypothesis C4: Predictors of Success as Decreased Pain

Predictors of decreased pain were analyzed for the overall sample and each of the three separate treatment programs. Success in this condition was defined as a decrease from pre- to post-treatment of at least 20% in reported pain severity, as measured by the MPI Pain scale. Possible scores range from 0 to 12. It was hypothesized that individuals with lower levels of distress and higher levels of activity would be more likely to be

classified as "successful." Neither of these variables were significant predictors for the overall sample nor for any of the separate treatment groups.

For the overall sample, as well as for each of the treatment programs, pre-treatment MPI Pain scores were initially entered as a potential predictor. Secondary analyses excluded pre-treatment MPI Pain scores as a predictor, as this score was used to calculate change scores, and thus to classify individuals as "successful" or "unsuccessful." Predictors of success were identified for the overall sample and the COP program. No predictors were identified in the statistical models for the MCOP and FIT program.

For the overall sample, initial analyses revealed a statistical model which included insurance type, chronicity of pain, number of physician visits and surgeries in the twelve months prior to treatment, and MPI Pain as predictors of decreased pain at post-treatment. However, insurance type was non-significant, despite its inclusion in the model. Thus, although those whose primary payer was Worker's Compensation benefits had a greater likelihood of not showing improvements in pain, the differences were too small to be considered significant. This finding, while not significant, is interesting and warrants brief mention. It may be that these individuals receive secondary gains from their pain condition, in that continued pain means continued receipt of Worker's Compensation benefits and decreased likelihood of returning to work. The confidence intervals for insurance type and chronicity of pain included 1.00 in their ranges, thus there is a high probability of making a Type I error, meaning they were identified as significant but really are not.

Fewer physician visits and number of surgical procedures in the twelve months prior to treatment were both significant predictors of significantly decreased pain at post-treatment in the overall sample. This may indicate that those who visit their physician(s) more frequently and/or undergo multiple surgical procedures, may be more likely to consider their pain as "real" (i.e. physiological), which warrants more visits and procedures aimed at the physiological causes of pain. Thus, when these individuals enter an interdisciplinary program focused on psychosocial variables of pain, they may be unwilling to consider these factors, and thus hold onto their pain. It could also be argued that these individuals have greater physiological causes for their pain, and thus this type of treatment is not as effective; however, this is inconsistent within a biopsychosocial theoretical framework. A third possibility is that their condition worsened following surgery, making it more difficult for them to see significant decrements in pain with interdisciplinary treatment.

Pre-treatment MPI Pain score was also a significant predictor of success in the overall sample of graduates, with those having higher levels of pre-treatment pain being more likely to have lowered post-treatment pain scores. What is interesting is that, although the pre-treatment MPI pain scores were statistically different among successful and unsuccessful participants, there was less than one point difference among the means. Differences at post-treatment were much larger (2.78 points). Analyzing the range of scores of the two groups, 82.6% of individuals who were "successful" began treatment with a pain severity at or above a score of 7; in the "unsuccessful" group, only 65.4% started treatment with a score at or above 7. Furthermore, 65.4% of successful individuals started treatment with a score of 8 or above, compared to 45% of

unsuccessful individuals. It could be hypothesized that there is a "magic" number in terms of success and pain severity, which is discussed later. Those who are below a score of 7 or 8 out of 12 in terms of pain severity may not be receiving the maximum benefits from treatment in terms of decreased pain severity. It is also hypothesized that those with higher scores are engaging in more pain catastrophizing prior to treatment. As treatment progresses, interventions may be aiding in the replacement of this particular type of thinking with more realistic and healthy methods of thinking; thus, these individuals are reaping greater benefit.

When the MPI Pain score was removed from the analysis of the overall sample, insurance type and pain chronicity were no longer significant predictors of decreased pain scores at post-treatment. Physician visits, surgical procedures, and MPI Interference were significant. This model was less accurate in its prediction than when MPI Pain was included. These findings again suggest that individuals who visit their doctor more frequently and/or undergo a greater number of surgical procedures may consider their pain to be more physiological in nature, and thus may not be able to successfully engage in treatments aimed at psychosocial factors. MPI Interference scores were highly correlated with MPI Pain. This particular score is purported to measure the amount of interference pain has on an individual's social and recreational activities, both in ability and enjoyment. Those with higher perceived interference of pain were more likely to have greater reduction in their pain severity over the course of treatment.

One explanation for this finding is derived from the biopsychosocial theoretical framework, in which social constructs impact pain. Treatment is provided in a group format which allows individuals to engage in treatment activities with other patients who

have similar difficulties. Over the four weeks of treatment, these individuals often form close relationships and typically enjoy each other's company. Thus, individuals are receiving a social experience in addition to treatment. For individuals who originally rated the inference of pain on such activities as extreme, participation in the treatment program may be the first time in awhile that they have had regular and frequent social interactions. Consequently, they may no longer view their pain as being as severe.

For the COP sample, the same predictors were included in the statistical model as for the overall sample when pre-treatment MPI Pain was included as a predictor. Insurance type remained statistically insignificant, despite the inclusion of this variable in the statistical model. Additionally, the confidence intervals contained 1.00 in the ranges, thus the likelihood of making a Type I error is high. However, the model suggests that those receiving Worker's Compensation benefits were again less likely to show improvement in pain, but the difference was too small to be considered significant. Chronicity of pain was significant; however, the confidence interval contained 1.00 in its range, and thus the likelihood of a Type I error is high. Number of physician visits and surgical procedures in the twelve months prior to treatment were significant predictors, as was MPI Pain scores. As with the overall sample, physician visits and surgical procedures may be indicative of a greater belief in and/or greater presence of physiological components to pain in the "unsuccessful" group of COP graduates.

Pre-treatment pain ratings were significantly different between COP graduates classified as successful and unsuccessful, as indicated by decreased pain at pre-treatment, but the groups differed by less than three-fourths of a point (0.72). Post-treatment differences were statistically significant and clinically relevant, with a difference of 2.78

points. Looking at the ranges of MPI Pain scores at pre-treatment in COP graduates, a greater proportion of those who were "successful" had original pain severity scores at or above 9 (72.2%) than those who were "unsuccessful" (51.8%). Again, as described later, there may be a "magic" cut-off score for pain severity, in that those falling above a certain score being more likely to receive benefit from the treatment program in terms of pain severity. Individuals with greater pain severity may also be engaging in more catastrophizing about their pain. During treatment, this way of thinking may be decreased or eliminated as the individual learns more about their pain and how to manage it.

When MPI Pain scores were removed from the analysis of COP graduates, the other predictors remained in the statistical model. Worker's Compensation was significant in this model and the confidence interval for the odds ratio did not overlap 1.00, indicating that the likelihood of making a Type I error was low. This finding indicated that those whose primary payer for treatment was Worker's Compensation were less likely to successfully reduce their pain severity. This finding may speak to the secondary gains that continuing pain has for these individuals, in that return to work is less likely and they will continue to receive Worker's Compensation benefits. These individuals may resist reporting and/or experiencing decreased pain as this would mean they would no longer receive monetary compensation. Other types of insurance were not significant and the confidence intervals for them indicated a high likelihood of a Type I error.

Chronicity of pain was again significantly related to decreased pain at post-treatment for the COP graduates. Individuals with greater chronicity of their pain

condition were less likely to have a "successful" decrease in pain. Gatchel (1996) hypothesized that over the course of time, psychosocial factors become more prominent in the pain condition. It may be that those individuals with greater chronicity of pain are more entrenched in the condition and psychosocial factors are more difficult to change. Thus, these individuals may find it more difficult to make the changes necessary to decrease their experience of pain. Physician visits and surgery were again significant predictors. As mentioned above, this may speak to the greater belief in the physiological nature of their pain that these individuals have, or the actual presence of greater physiological etiology.

For the both MCOP and FIT, no significant predictors of "success" were identified. Pre-treatment MPI Pain scores did not differ significantly among the "successful" and "unsuccessful" participants for either group. At post-treatment, MPI Pain scores of the two groups differed significantly in both of the treatment programs, with "successful" individuals reporting much lower pain severity. This speaks to the effectiveness of treatment in reducing pain for a subset of individuals.

"Success" in the analyses for this hypothesis was considered a 20% or greater decrease in pain severity. Thus, even those individuals who were considered "unsuccessful" could still have a decrease in pain by up to 19.99%. Looking at the frequency of change scores, this was not the case for most "unsuccessful" individuals. In fact, the vast majority actually had *greater* pain at the end of treatment. For the overall sample, 61.7% of "unsuccessful" individuals had no change in pain or greater pain at post-treatment. In the COP, 57.7% had no change or worse pain, as was the case for 66.7% of those in MCOP, and 69.9% of those in FIT. Thus, it appears that this criterion

for defining success in terms of pain severity, proposed by the IMMPACT committee (Dworkin, Turk, Wyrich, Beaton, Cleeland, Farrar, et al., 2008), is useful and adequately captures differences in outcomes; however, this study was not able to identify predictors of successful outcomes for two of the treatment programs.

Comparing changes in reported pain on the MPI across the programs, it was revealed that treatment produced significant changes over time. None of the treatment programs were found to differ significantly in the amount of change produced across treatment, controlling for original pain reports. These findings speak to the effectiveness of interdisciplinary pain programs in decreasing pain, regardless of treatment intensity.

Hypothesis C5: Predictors of Success as Increased Control

Predictors of success were analyzed for the overall sample and each of the three separate treatment programs. Success in this condition was defined as an increase of at least 20% in reported perceived control over pain from pre- to post-treatment, as measured by the MPI Control scale. Possible scores range from 0 to 12, with higher scores signifying greater perceived control. It was hypothesized that individuals with lower levels of distress would be more likely to be classified as "successful." The opposite was true for the overall sample, COP, and FIT, as those with *higher* initial distress were more likely to be classified as "successful." Distress was less predictive than initial low levels of self-efficacy.

For the overall sample, as well as each of the three programs, lower levels of self-efficacy (as measured by MPI Control) at pre-treatment was predictive of being successful, as defined by a 20% increase in MPI Control scores from pre- to post-

treatment. Furthermore, the two groups (S and US) showed clinically and statistically significant differences at post-treatment. What is most interesting, are the mean post-treatment MPI Control scores of those considered "unsuccessful," as they were worse than mean pre-treatment scores. This indicates that there is a clinically relevant difference between the two groups that warrants attention.

It can be hypothesized that there are two types of individuals who present with high scores on the MPI Control scale at pre-treatment. The first group consists of individuals who are presenting themselves as functioning at a higher level than they truly are. In other words, these individuals are not recognizing and/or acknowledging the full extent of their difficulties. The second group consists of individuals who are actually able to adequately manage their pain and are functioning at a high level. For the first group, as treatment progresses these individuals become more conscious of their struggles and may be more willing to admit such difficulties as they leave treatment. It could be argued that these individuals, who are classified as "unsuccessful" are successful in other ways, as they have a more accurate perception of their difficulties when they leave treatment (thus the lower levels of control at post-treatment). For the second group of individuals, they have less room for improvement, as they are already functioning at or near an optimal level. Thus, the measures utilized in this project for quantifying success are not useful for this group of individuals.

When MPI Control was not included as a predictor of success, MPI Distress was found to be significant for all of the groups except MCOP. No other significant predictor variables, beyond MPI Control, were identified for the MCOP group. In addition to MPI Distress, perceived physical health was a significant predictor for the overall sample and

COP. These findings may reflect the feelings of helplessness present in those who enter the programs with higher degrees of affective distress. These individuals may be more open to interventions aimed at their distress that secondarily increases their feelings of self-efficacy. Initial perceived physical health is likely tied to initial feelings of control as well. Thus, as perceived health decreases, so does perceived control over pain.

Comparing changes in reported control on MPI Control across the programs, it was revealed that treatment produced significant changes over time. None of the treatment programs were found to differ significantly in the amount of change produced across treatment, controlling for original reports of control. These findings speak to the effectiveness of interdisciplinary pain programs in increasing control, regardless of treatment intensity or baseline levels of perceived control.

Additional Analyses

Comparison of Rates of Success among COP and FIT in Five Areas

If we are to maintain the common statement that interdisciplinary treatment programs aim to aid individuals in making gains in multiple areas of their lives, then success should be viewed as making positive gains in multiple areas. It was proposed that more intensive programs are necessary to produce such changes. COP had higher rates of success in all categories except one. COP displayed statistically higher rates of success in four of the five individual definitions of success, as well as higher rates in number of successes out of the five areas. COP and FIT were comparable in success rates when success was defined as decreased pain severity, with 53.1% of participants being successful in COP compared to 49.0% in FIT. In contrast, 63.9% of COP

participants were successful in terms of increased perceived control, compared to 42.9% of FIT participants. When success was measured in terms of total number of areas of significant improvement, differences in success rates between COP and FIT became increasingly significant as the number of successes required increased. For instance, 71.3% of participants completing COP were successful in three or more areas compared to 44.5% of FIT participants. It can be argued that less intensive programs are likely to produce small changes, but may not fully meet the stated aim of treatment (i.e. treating pain as a biopsychosocial phenomenon).

Predictors of Success in Three Areas

Careful discussion regarding previous conceptualization of success and lack of continuity in predictors resulted in secondary analyses. It was proposed that "success" in any one area could be influenced by several factors. For instance, changes from pre- to post-treatment may be a reflection of regression toward the mean. It could also be argued that success in only one area is not truly an accurate reflection of general, overall well-being. It was decided to evaluate predictors of multiple successes. As interdisciplinary treatment programs purport to decrease dysfunction in multiple areas, it was justifiable to define success as meeting criteria for successful change in three or more of the five areas of success.

Analyses of predictors revealed lower scores on MPI Control scale (self-efficacy) to be predictive of success across all samples. It is hypothesized that this is reflective of two possibilities. Individuals entering treatment with high levels of perceived control may be functioning at a higher level than those with little perceived control. Thus, they

may not need to make significant gains over treatment. However, the high levels of reported control at pre-treatment by these individuals may be reflective of something different entirely. Namely, it could also be that these individuals are resistant to acknowledging the difficulties that they are experiencing. Thus, they may be unwilling to fully engage in treatment. Consequently, these individuals are unable to receive maximum benefit from the programs. This finding is similar to those of Burns (2000), in that lack of acknowledgement of emotional concerns as a means of preserving psychological equilibrium interferes with not only the process, but also the outcomes of treatment.

For the overall sample, in addition to MPI Control, fewer surgeries in the twelve months prior to treatment was predictive of success. It can be hypothesized that these individuals are less entrenched in the idea that their pain is purely a "physiological" problem, and thus are less likely to seek out extreme measures to "fix" them. This way of thinking may aid them in approaching an interdisciplinary treatment program and its psychosocial interventions with an open mind.

In COP, in addition to MPI Control, fewer surgeries in the twelve months prior to treatment and lower perceived physical health was predictive of success. As with the overall sample, fewer surgeries is likely reflective of individuals who are less entrenched in the idea that their pain is purely "physiological," and consequently are more open to psychosocial interventions. Perceived physical health can be viewed similarly to MPI Control; those entering treatment with higher perceived physical health may be functioning at a higher level at pre-treatment, and thus significant changes are not crucial for these individuals. However, it could also reflect resistance to admitting difficulties.

Individuals reporting higher levels of perceived health may be unwilling to admit the impact of pain on their functioning, thus they are unable to engage fully in treatment. Insurance type was included in the statistical model for the overall sample, as well as the COP sample; however, it was not statistically significant.

In FIT, MPI Control was the only significant predictor of success.

Predictors of Success in All Five Areas

It was decided to investigate predictors of success, with success being defined as meeting criteria for success in all five areas, in order to identify relevant variables for complete success; these individuals were termed "superstars." Caution is warranted when interpreting these findings, as only 18.6% (n=100) of COP participants and 3.2% (n=7) of FIT participants met criteria for success in this condition. Analyses of predictors revealed lower scores on MPI Control scale (self-efficacy) to again be predictive of success across all samples. As with the analysis investigating predictors of success in three areas, this appears to be reflective of two possibilities. Individuals entering treatment with high levels of perceived control may be functioning at a higher level than those with little perceived control. Thus, they may not need to make significant gains over treatment. However, the high levels of reported control at pre-treatment may be reflective of a resistant toward acknowledging the difficulties that these individuals are experiencing. Thus, they may be unwilling to fully engage in treatment. Consequently, these individuals are unable to receive maximum benefit from the programs.

For the overall sample, greater interference of pain in functioning was also predictive of success. The same argument presented for control, (i.e., findings are

reflective of higher levels of functioning *or* could represent defensiveness toward admitting difficulties) can apply to interference as well. Lower levels of reported interference could be a reflection of higher levels of functioning or defensiveness toward admitting difficulties. For the FIT sample, lower control, greater interference and greater walking ability at pre-treatment were significant predictors of success. It can be hypothesized that greater walking performance is reflective of motivation, as this is how it is often conceptualized in clinical practice. Thus, individuals who enter treatment with a higher level of motivation are more likely to engage in treatment. Another argument could be that those entering treatment with greater physical ability as less "disabled" and thus will be able to engage in all areas of treatment.

Identifying Relevant Pre-Treatment Variables and Appropriate Cut Scores

Relevant variables and useful cut-scores were explored to aid clinicians in determining appropriate treatment for patients. MPI Pain, MPI Interference, MPI Distress, MPI Control, BDI-II, number of hours resting per day, and standing performance were investigated. Hours resting and MPI Pain were found to be useful, as the percent of successful individuals differed among the two treatment programs. More specifically, individuals with a reported MPI Pain score of six or more, and individuals resting seven or more hours per day were found to do significantly better in COP than FIT. These findings will be clinically useful, as they can aid in treatment assignment. Furthermore, these findings indicate that individuals who have a medium to high amount of reported pain need the greater intensity program to address their difficulties. In addition, individuals who are resting the majority of the day will need a more intensive

program to adequately meet their treatment needs. This finding is interesting, especially given that greater number of hours resting was predictive of non-graduation in the less intensive programs. Taken together, it appears that individuals reporting a significant amount of time spent resting during the day will need a more intensive program in order to increase their chances not only of staying in treatment, but also in receiving the maximum benefit.

Analysis of New Definitions of Success

The criteria for defining success resulted in individuals being classified as "unsuccessful" often displaying a level of functioning similar to "successful" individuals at post-treatment. Therefore, it was decided to begin to explore new definitions of success. Success was redefined for BDI-II, walking performance, MPI Pain, and MPI Control to include not only a percent change but also a clinically defined criteria of success (ie. minimally depressed, minimal limitations for walking, low pain, and high control) for post-treatment levels of functioning. This method of defining success controlled for pre-treatment levels of functioning. Based on these definitions, chi-square analyses were run to investigate differences in success rates among COP and FIT. Success was defined as success in three or more areas. The overall sample was analyzed, as well as a sample including only those participants who reported resting seven or more hours at pre-treatment and a sample with participants who reported pain of six or more at pre-treatment. Utilizing these new definitions of success, the findings were similar to those found previously. Specifically, COP participants showed superior outcomes to FIT; however, there was a trend toward FIT showing slightly better outcomes than with

the previous definition. Overall, COP continued to have significantly higher rates of success across each of the samples.

CLINICAL IMPLICATIONS

These findings speak to the need for a "primer" treatment for some individuals prior to entering structured treatment. Certain areas of difficulty appear to need interventions which will increase compliance and benefits received from treatment. Namely, individuals with higher levels of distress who report a large number of hours resting and are frequent utilizers of health care resources would likely benefit from pre-treatment interventions to increase the chances of these individuals graduating. These interventions would focus on these areas of dysfunction and begin to address the catastrophic thinking and fear related to pain.

This project also revealed that individuals with low levels of dysfunction did not display significant gains and were less likely to be considered "successful." This is likely a result of two different types of patients. First, there is a subset of patients reporting low levels of dysfunction who are truly functioning at a higher level. These individuals will still receive benefit from treatment; however, other means of measuring success would be useful. The other subset of patients reporting low levels of dysfunction are likely comprised of individuals who are resistant to admitting their difficulties. Clinically, these individuals will need more intensive treatment, and possibly a "primer" to treatment, to address this resistance. Once their defenses begin to subside, their ability to fully engage in treatment and receive maximum benefits will increase.

Finally, the findings indicate that greater hours resting and high reported pain severity are indicators of a need for more intense treatment. Specifically, individuals who report resting seven or more hours and individuals who report a pain severity of six or greater (out of a total of 12) are prime candidates for the most intensive treatment available. These two variables are relatively straightforward and inexpensive to measure.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

As with all research, there are several limitations to this current project. The sample size of MCOP was small, especially in comparison to FIT and COP. This likely impacted that ability to identify statistically significant predictor variables. It would be beneficial in the future to compare treatment outcomes and investigate predictors of outcomes when a larger sample size is available.

Additional limitations to this study were the definitions of success, as many higher functioning individuals were considered "unsuccessful" due to changes too small over the course treatment to be classified as "successful." The definitions used in this dissertation project were based in large part on the recommendations of the IMMPACT committee (Dworkin, Turk, Wyrich, Beaton, Cleeland, Farrar, et al., 2008). It appears that utilizing a two part definition in which individuals are considered successful based on percent change *or* cut-off scores was a more adequate method for quantifying success. However, future consideration and research is needed to evaluate this statement.

Finally, this research was retrospective and utilized a clinical sample of patients seen in interdisciplinary treatment programs. Patient assignment was based on clinical experience and patient availability for treatment. Consequently, individuals assigned to

COP were often more dysfunctional than those assigned to FIT. Assignment to MCOP was often the product of geographic location. Due to these factors, a bias is introduced and the level of functioning is skewed across the programs. A more effective and controlled method for comparing treatment programs would entail random assignment, as it would control for variability in initial functioning among the samples.

CONCLUSIONS

This study aimed to examine predictors of completion and success in interdisciplinary treatment for chronic pain and to provide clinicians with relevant information in determining the appropriate treatment intensity for patients. A total of 1,062 patients were examined who participated in one of three different levels of treatment intensity: a 120 hour treatment program (n=699), a 72 hour treatment program (n=61), and a 24 hour treatment program (n=302). No single measure was found to be a significant predictor across all five domains. However, hours resting appeared to be one of the most significant variables for both treatment completion and success. Specifically, individuals who report greater hours resting per day were at risk for pre-mature termination from the two less intensive programs. Of note, number of hours resting was not a significant predictor of non-completion in the more intensive program (COP). Thus, individuals who are resting a significant portion of the day may need a more intensive program. Furthermore, individuals who report resting a large part of the day have a 70% chance of being successful in the COP program, versus a 29% chance of success in the FIT program. In addition to hours resting, greater emotional distress and greater number of ER visits in the twelve months prior to treatment were significant

predictors of dropping out of treatment. Thus individuals who are highly anxious and distressed and go to extreme measures to treat their pain may not be ready for an interdisciplinary treatment program. These types of individuals may need interventions aimed at patterns of catastrophic thinking and additional support prior to entering a structured program.

Patterns of predictors arose across the different definitions of success, although no particular measure appeared to be superior. Emotional distress, perceived impact of pain on functioning, perceived control over pain, and health care utilization appear to be important for differentiating who will be successful and who will not. Perceived control over pain was the strongest predictor of success, as it yielded the highest odds ratio among all of the analyses investigating the five definitions of success. Furthermore, it remained a stable predictor when investigating predictors of success in multiple domains. Interestingly, individuals did better when they had higher levels of distress, greater interference, and less control.

In conclusion, this dissertation provides a thorough and comprehensive evaluation of predictors of premature termination from treatment, as well as predictors of success. These findings add to the growing body of research related to treatment response in chronic pain patients and provide clear directions for future research. Finally, this project revealed clinically relevant variables which will aid clinicians in treatment planning and determining the most appropriate intensity of treatment for patients.

APPENDIX A
Figures

Figure 1. Hypothesis A: Forward Binary Logistic Regression to Determine Predictors of Graduation for the Overall Sample
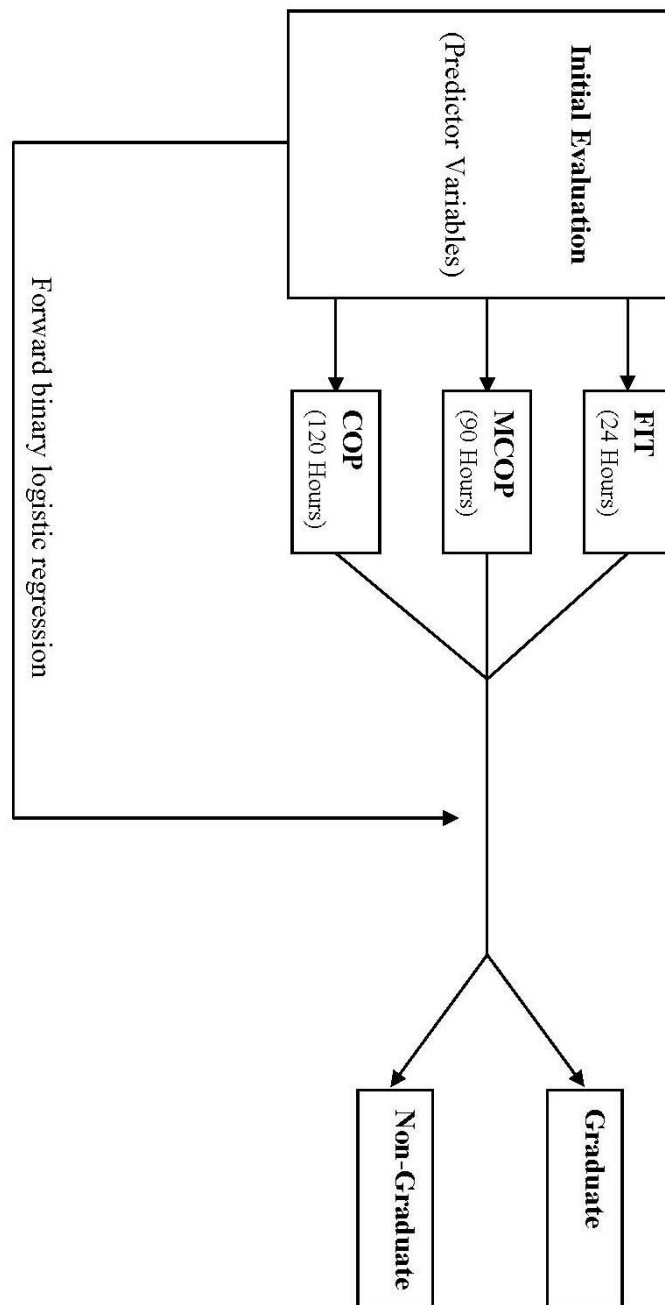
Figure 2. Hypothesis B: Three Forward Binary Logistic Regressions to Determine Predictors of Graduation in FIT, MCOP, and COP.
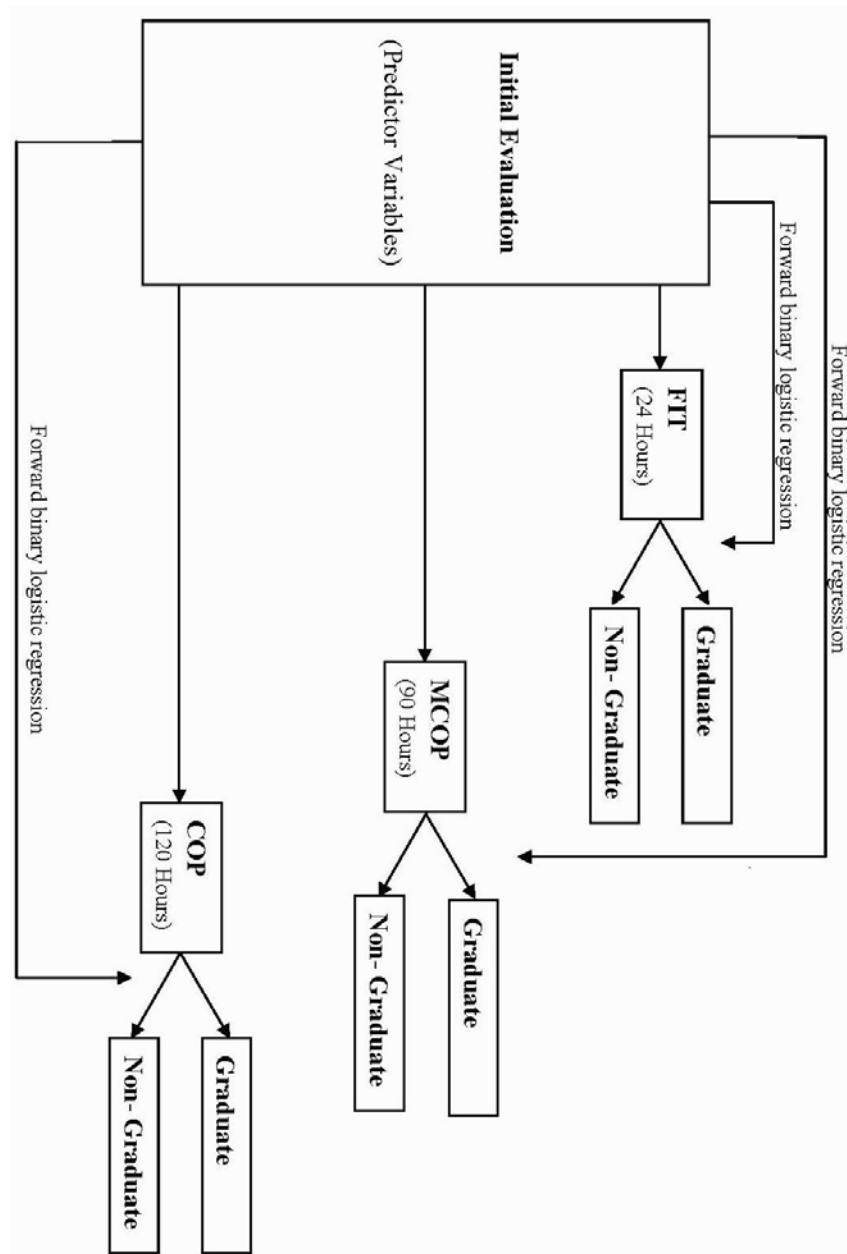
Figure 3. Hypothesis C: Forward Binary Logistic Regressions to Determine Predictors of the Five Definitions of Success for the Overall Sample of Graduates.
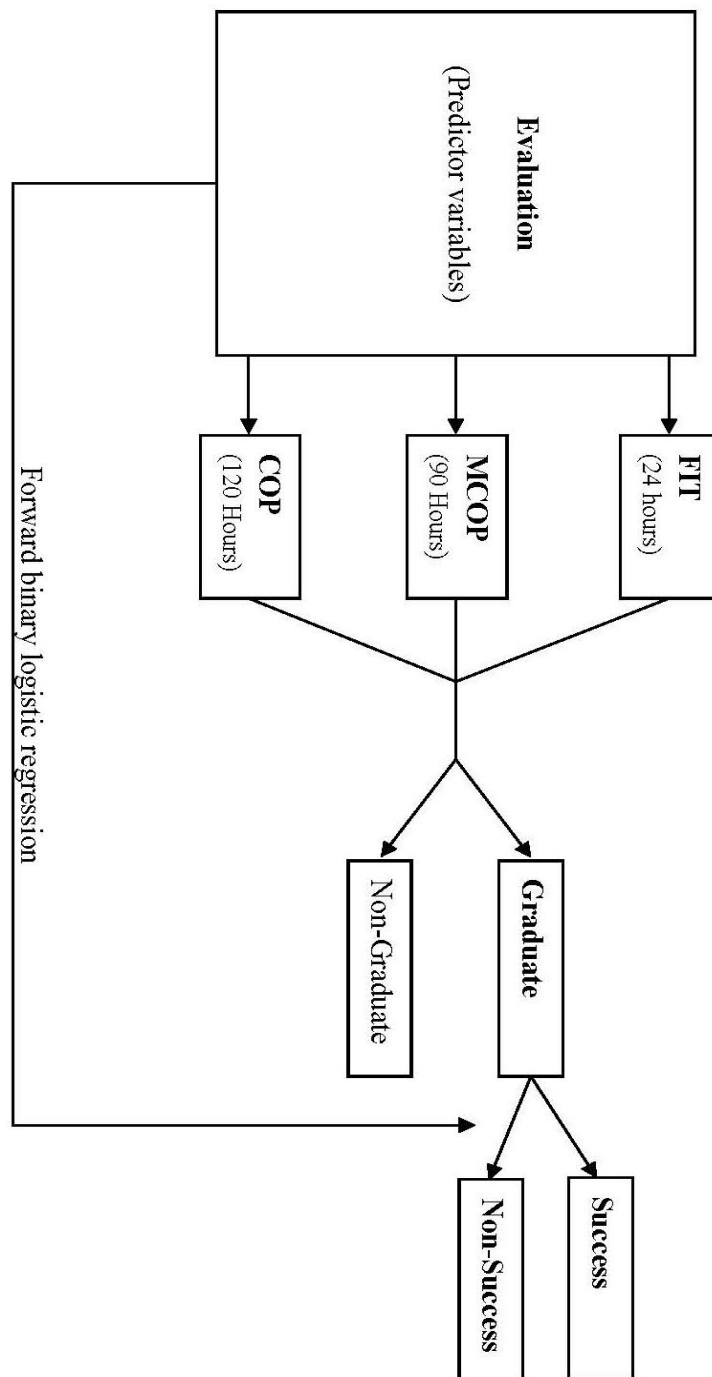
Figure 4. Hypothesis C: Forward Binary Logistic Regressions to Identify Predictors of Success in FIT, MCOP, and COP.
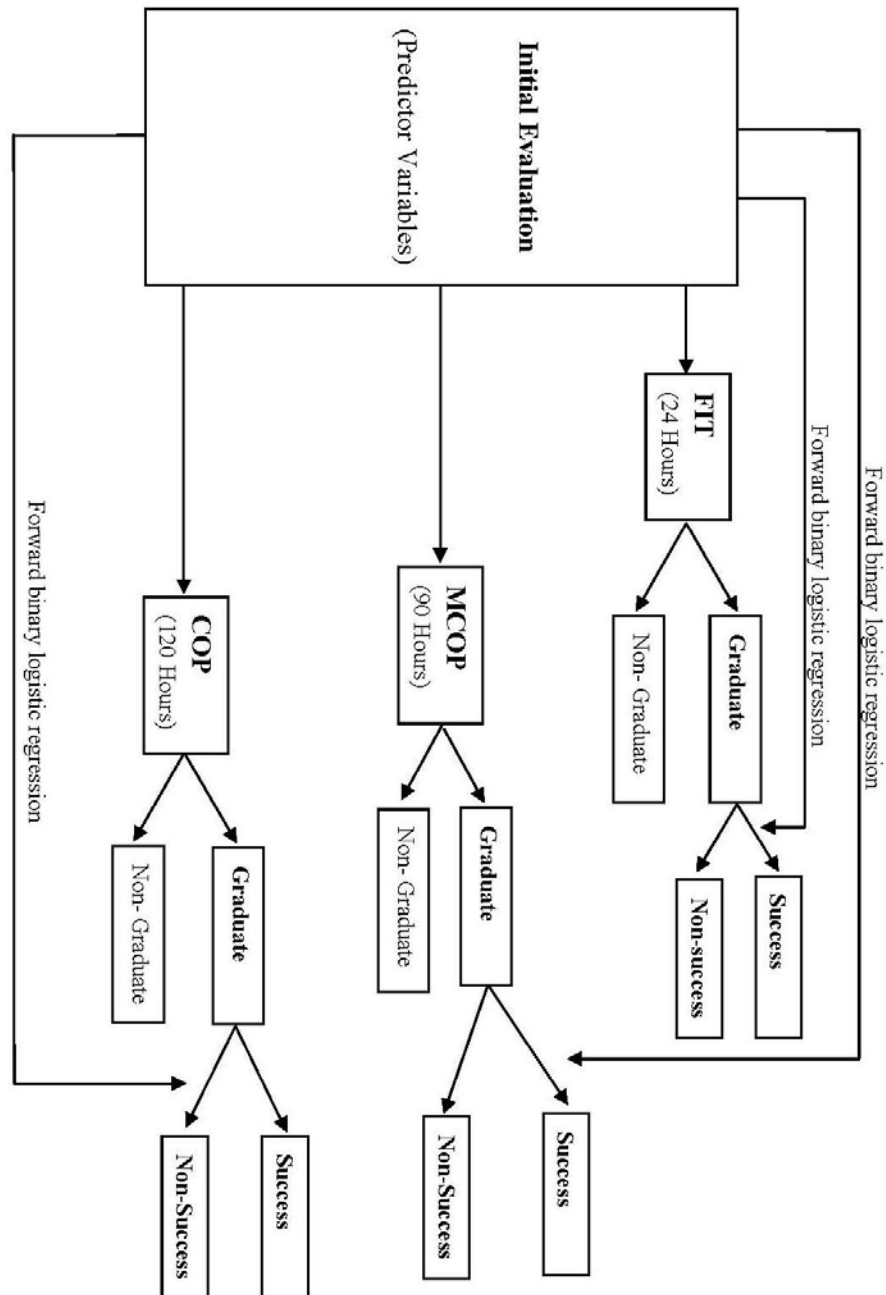
Figure 5. Rates of Success in COP and FIT, With Success Defined as the Number of Domains (e.g., Decrease in Pain, Increase in Control, etc.) in Which Success was Achieved
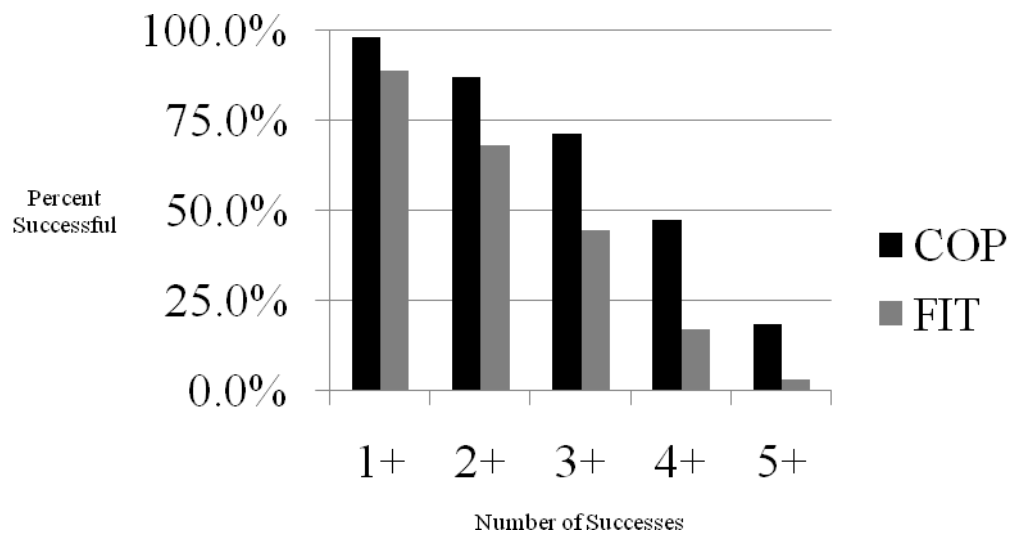
Figure 6. Rates of Success in COP and FIT across Increasingly Greater Number of Hours Resting at Pre-Treatment
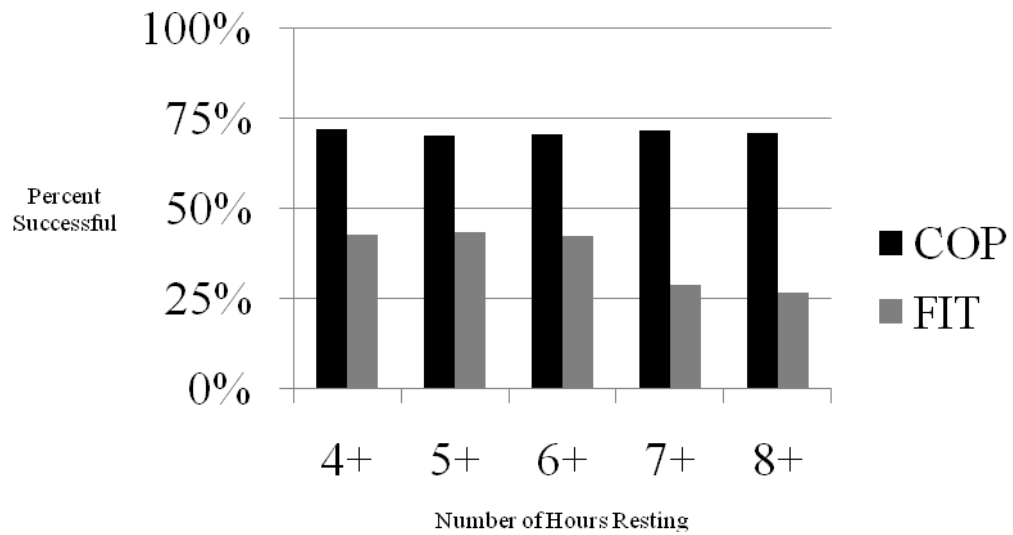
Figure 7. Rates of Success in COP and FIT. Pre-Treatment Pain Scores Display
Differences in Success Rates across Increasingly Higher Pre-Treatment Pain Scores
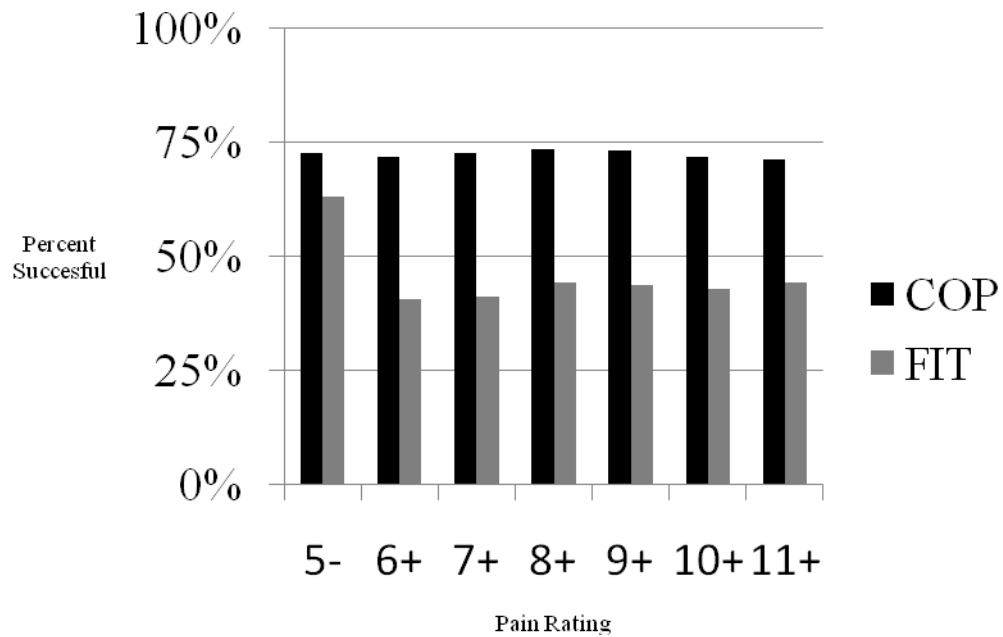
APPENDIX B
Tables

Table 1. Total Number of Sessions of Each Treatment Component by Treatment Group

Treatment Component	FIT (Sessions)	MCOP (Sessions)	COP (Sessions)
Physical Therapy	8	15	19
Group Education	8	15	19
Individual Behavioral Medicine	8	10	8
Relaxation Training	0	5	12
Aquatic Therapy	0	15	17
Occupational Therapy	4	5	19

Table 2. Demographic Variables for the Entire Sample

		Treatment Program		
Variable	Total Sample (N=1062)	FIT (n=302)	MCOP (n=61)	COP (n=699)
Gender (%)				
Female	72.8% (773)	76.5% (231)	77.0% (47)	70.8% (495)
Male	27.2% (289)	23.5% (71)	23.0% (14)	29.2% (204)
Age (years)				
Mean (SD)	50.02 (12.47)	52.15 (13.59)	49.62 (12.62)	49.13 (11.84)
Minimum	17	17	18	18
Maximum	80	80	77	75
Pain Duration (mo.)				
Mean	92.99	100.48	106.26	88.21
(SD)	(107.52)	(108.64)	(93.94)	(108.08)
Minimum	2	3	8	2
Maximum	744	600	384	744
Race				
White	81.5%	286.1%	86.9%	79.0%
African Am	12.6%	7.9%	6.6%	15.2%
Hispanic	4.6%	11%	4.9%	5.0%
Asian	0.3%	0.3%	1.6%	0.1%
Other	1.0%	2.0%	0%	0.7%
Marital Status				
Married	66.5%	74.5%	63.9%	63.2%
Single	15.0%	9.3%	21.3%	16.9%
Divorced	12.7%	11.9%	14.8%	12.9%
Widowed	4.3 %	3.6%	0%	5.0%
Other	1.5%	0.7%	0%	2.0%

Table 2 (continued). Demographic Variables for the Entire Sample

| Variable | Total Sample (N=1062) | Treatment Program | | |
		FIT (n=302)	MCOP (n=61)	COP (n=699)
Insurance Type				
Medicare	25.9%	28.1%	23.0%	25.2%
Commercial	54.5%	65.6%	77.0%	47.8%
WC	11.7%	5.0%	0%	15.6%
Other	0.9%	0%	0%	11.4%

WC= Worker's Compensation

Table 3. Statistical Comparisons of the Three Treatment Groups on Demographic
Variables for the Entire Sample

Treatment Program	Gender	% w/in Group	χ^2	df	p
FIT	Male	23.5%	4.087	2	.130
	Female	76.5%			
MCOP	Male	23.0%			
	Female	77.0%			
COP	Male	29.2%			
	Female	70.8%			

Treatment Program	Mean Age (yrs.)	SD	F	df	p
FIT	52.15	13.585	6.238	2	.002
MCOP	49.62	12.615			
COP	49.13	11.842			

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Table 3 (continued). Statistical Comparisons of the Three Treatment Groups on Demographic Variables for the Entire Sample

Treatment Program	Race	% w/in Group	χ^2	df	p
FIT	White	86.1%	20.580	8	.008
	African Am	7.9%			
	Hispanic	3.6%			
	Asian	0.3%			
	Other	2.0%			
MCOP	White	86.9%			
	African Am	6.6%			
	Hispanic	4.9%			
	Asian	1.6%			
	Other	0%			
COP	White	79.0%			
	African Am	15.2%			
	Hispanic	5.0%			
	Asian	0.1%			
	Other	0.7%			

Table 3 (continued). Statistical Comparisons of the Three Treatment Groups on
Demographic Variables for the Entire Sample

Treatment Program	Marital Status	% w/in Group	χ^2	df	p
FIT	Married	74.5%	26.051	8	.001
	Single	9.3%			
	Divorced	11.9%			
	Widowed	3.6%			
	Other	0.7%			
MCOP	Married	63.9%			
	Single	21.3%			
	Divorced	14.8%			
	Widowed	0%			
	Other	0%			
COP	Married	63.2%			
	Single	16.9%			
	Divorced	12.9%			
	Widowed	5.0%			
	Other	2.0%			

Table 3 (continued). Statistical Comparisons of the Three Treatment Groups on Demographic Variables for the Entire Sample

Treatment Program	Insurance Type	% w/in Group	χ^2	df	p
FIT	Medicare	28.1%	101.659	8	<.001
	Commercial	65.6%			
	Workers' Comp.	5.0%			
	Other	0%			
MCOP	Medicare	23.0%			
	Commercial	77.0%			
	Workers' Comp	0%			
	Other	0%			
COP	Medicare	25.2%			
	Commercial	47.8%			
	Workers' Comp.	15.6%			
	Other	1.4%			

Treatment Program	Mean Duration (mos.)	SD	F	df	p
FIT	100.48	108.641	1.792	2	.167
MCOP	106.26	93.937			
COP	88.21	108.080			

Table 4. Demographic Variables for Graduates Only

| | | Treatment Program | | |
Variable	Total Sample (N=801)	FIT (n=220)	MCOP (n= 44)	COP (n=537)
Gender (%)				
Female	73.3% (587)	78.6% (173)	75.0% (33)	70.9% (381)
Male	26.7% (214)	21.4% (47)	25.0% (11)	29.1% (156)
Age (years)				
Mean (SD)	50.86 (12.485)	53.56 (13.40)	50.34 (12.79)	49.79 (11.91)
Minimum	18	19	18	18
Maximum	80	80	77	75
Pain Duration (months)				
Mean	93.85	101.54	115.7	88.54
(SD)	(109.77)	(109.11)	(104.04)	(110.33)
Minimum	3	3	8	3
Maximum	744	600	324	744
Race				
White	82.4%	85.5%	88.6%	80.6%
African Am	11.7%	8.2%	4.5%	13.8%
Hispanic	4.5%	3.2%	4.5%	5.0%
Asian	0.4%	0.5%	2.3%	0.2%
Other	1.0%	2.7%	0%	0.4%

Table 4 (continued). Demographic Variables for Graduates Only

| | | Treatment Program | | |
Variable	Total Sample (N=801)	FIT (n=220)	MCOP (n= 44)	COP (n=537)
Marital Status				
Married	68.7%	74.1%	70.5%	66.3%
Single	14.1%	9.5%	20.5%	15.5%
Divorced	12.0%	10.9%	9.1%	12.7%
Widowed	4.2%	4.5%	0%	4.5%
Other	1.0%	0.9%	0%	1.1%
Insurance Type				
Medicare	25.1%	29.5%	22.7%	23.5%
Commercial	53.8%	64.5%	77.3%	47.5%
WC	12.4%	4.1%	0%	16.8%
Other	1.0%	0%	0%	1.5%

WC= Worker's Compensation

Table 5. Statistical Comparisons of the Three Treatment Groups on Demographic
Variables for Graduates Only

Treatment Program	Gender	% w/in Group	χ^2	df	p
FIT	Female	78.6%	4.901	2	.086
	Male	21.4%			
MCOP	Female	75.0%			
	Male	25.0%			
COP	Female	70.9%			
	Male	29.1%			

Treatment Program	Mean Age (yrs.)	SD	F	df	p
FIT	53.56	13.401	7.201	2	.001
MCOP	50.34	12.790			
COP	49.79	11.913			

Treatment Program	Race	% w/in Group	χ^2	df	p
FIT	White	85.5%	19.621	8	.012
	African Am	8.2%			
	Hispanic	3.2%			
	Asian	0.5%			
	Other	2.7%			
MCOP	White	88.6			
	African Am	4.5%			
	Hispanic	4.5%			
	Asian	2.3%			
	Other	0%			
COP	White	80.6%			
	African Am	13.8%			
	Hispanic	5.0%			
	Asian	0.2%			
	Other	0.4%			

Table 5 (continued). Statistical Comparisons of the Three Treatment Groups on
Demographic Variables for Graduates Only

Treatment Program	Gender	% w/in Group	χ^2	df	p
FIT	Married	74.1%	12.394	8	.134
	Single	9.5%			
	Divorced	10.9%			
	Widowed	4.5%			
	Other	0.9%			
MCOP	Married	70.5%			
	Single	20.5%			
	Divorced	9.1%			
	Widowed	0%			
	Other	0%			
COP	Married	64.7%			
	Single	15.5%			
	Divorced	12.7%			
	Widowed	4.5%			
	Other	1.1%			

Treatment Program	Insurance Type	% w/in Group	χ^2	df	p
FIT	Medicare	29.5	83.245	8	<.001
	Commercial	64.5%			
	Workers Comp	4.1%			
	Other	0%			
MCOP	Medicare	22.7%			
	Commercial	77.3%			
	Workers Comp	0%			
	Other	0%			
COP	Medicare	23.5%			
	Commercial	47.5%			
	Workers Comp	16.8%			
	Other	1.5%			

Table 5 (continued). Statistical Comparisons of the Three Treatment Groups on
Demographic Variables for Graduates Only

Treatment Program	Mean Duration (mos.)	SD	*F*	df	*p*
FIT	101.54	109.110	1.987	2	.138
MCOP	115.73	104.042			
COP	88.54	110.333			

Table 6. Hypothesis A: T-Tests Comparing Graduates and Non-Graduates for the Overall Sample.

Variable	Status	N	Mean (SD)	t	df	Sig.
Rest	Non-graduate	170	5.97 (2.936)	1.707	835	.088
	Graduate	667	5.54 (2.964)			
BDI-II	Non-graduate	170	24.74 (12.329)	3.075	234.840	.002
	Graduate	667	21.58 (10.427)			
BAI	Non-graduate	170	20.42 (12.436)	3.308	231.908	.001
	Graduate	667	17.00 (10.335)			
Control	Non-graduate	170	6.46 (2.810)	-.101	835	.920
	Graduate	667	6.49 (2.561)			
Pain	Non-graduate	170	8.96 (2.205)	1.627	835	.104
	Graduate	667	8.68 (1.986)			
Walk	Non-graduate	170	14.46 (5.931)	-1.859	835	.063
	Graduate	667	15.38 (5.648)			

Table 7. Hypothesis A: Predictors of Graduation for the Overall Sample.

Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
BAI	-.022	.007	10.366	1	.001	.978	.965	.991
ER	-.177	.034	27.159	1	<.001	.838	.784	.896
Constant	1.861	.154	145.136	1	<.001	6.428		

Table 8. Hypothesis B: T-Tests Comparing Graduates and Non-Graduates for Each of the Three Treatment Programs.

Prog.	Variable	Status	N	M	SD	t	df	Sig.
COP	Hours Resting	NG	95	6.37	2.907	1.283	500	.200
		G	407	5.94	2.968			
	BAI	NG	95	21.68	12.762	2.768	121.900	.007
		G	407	17.76	9.933			
	Control	NG	95	6.62	2.837	1.577	129.531	.117
		G	407	6.12	2.478			
	Pain	NG	95	9.22	2.125	1.435	500	.152
		G	407	8.91	1.815			
	Walking	NG	95	14.53	6.265	-1.124	500	.261
		G	407	15.26	5.624			
	Physician Visits	NG	95	11.65	13.964	1.035	500	.301
		G	407	10.38	9.879			
	ER visits	NG	95	1.93	2.745	2.557	115.718	.012
		G	407	1.17	1.894			
	MH Visits	NG	95	6.07	11.597	2.059	109.364	.042
		G	407	3.53	6.675			
	Treatment Procedures	NG	95	2.25	2.370	1.085	500	.279
		G	407	1.96	2.360			
	Diagnostic Procedures	NG	95	2.71	1.945	1.093	500	.275
		G	407	2.43	2.221			
	Surgeries	NG	95	.92	1.389	.179	500	.858
		G	407	.87	2.128			
	Age	NG	95	47.56	11.90	-1.769	500	.077
		G	407	49.90	11.56			
	Chronicity	NG	95	89.99	98.423	-.461	500	.645
		G	407	95.99	117.57			

MH= Mental Health

Table 8 (continued). Hypothesis B: T-Tests Comparing Graduates and Non-Graduates for Each of the Three Treatment Programs.

Prog.	Variable	Status	N	M	SD	t	df	Sig.
MCOP	Physician Visits	NG	17	9.41	5.136	-.965	57	.338
		G	42	11.81	9.668			
	ER visits	NG	17	2.59	3.709	1.589	20.342	.128
		G	44	1.07	2.161			
	MH Visits	NG	17	3.71	5.157	-.081	58	.936
		G	43	3.86	7.140			
	Surgeries	NG	17	.82	1.590	.976	21.254	.340
		G	43	.42	1.006			
	Hours Resting	NG	16	6.06	2.999	2.182	21.180	.040
		G	44	4.27	2.203			
	Chronicity	NG	17	81.76	55.815	-1.639	52.553	.107
		G	44	115.7	104.04			
	Pain	NG	17	8.94	1.983	.405	59	.687
		G	44	8.75	1.512			
	Interference	NG	17	11.00	1.414	1.573	59	.121
		G	44	10.09	2.208			
	Control	NG	17	6.76	2.562	-.379	59	.706
		G	44	7.02	2.318			
	Standing	NG	16	14.81	5.969	1.030	58	.307
		G	44	13.41	4.116			

MH=Mental Health

Table 8 (continued). Hypothesis B: T-Tests Comparing Graduates and Non-Graduates for Each of the Three Treatment Programs.

Prog.	Variable	Status	N	M	SD	t	df	Sig.
FIT	Age	NG	82	48.38	13.434	-2.983	299	.003
		G	219	53.56	13.401			
	Chronicity	NG	75	97.45	107.95	-.280	289	.780
		G	216	101.5	109.11			
	Physician Visits	NG	74	9.12	9.034	.588	289	.557
		G	217	8.51	7.208			
	ER visits	NG	75	1.64	2.705	3.265	82.575	.002
		G	218	.59	1.100			
	Treatment Procedures	NG	74	1.89	2.230	-.390	290	.697
		G	218	2.00	2.122			
	Diagnostic Procedures	NG	74	2.20	1.752	.334	291	.739
		G	219	2.10	2.430			
	Surgeries	NG	74	.59	1.423	-.017	291	.987
		G	219	.60	1.665			
	Hours resting	NG	75	5.12	2.765	3.413	291	.001
		G	218	3.90	2.627			
	Distress	NG	75	7.60	3.409	3.227	293	.001
		G	220	6.17	3.273			
	Walking	NG	20	16.00	4.668	-.684	125	.495
		G	107	16.90	5.499			

Table 9. Hypothesis B: Predictors of Graduation for Each of the Three Treatment Programs

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
COP	ER	-.163	.043	14.671	1	<.001	.850	.782	.923
	BAI	-.031	.009	96.409	1	.001	.970	.953	.987
	Constant	2.137	.218	96.409	1	<.001	8.476		
MCOP	Rest	-.292	.125	5.426	1	.020	.747	.584	.955
	Constant	2.516	.756	11.076	1	.001	12.378		
FIT	ER	-.274	.080	11.646	1	.001	.760	.649	.890
	Rest	-.030	.053	6.115	1	.013	.878	.792	.973
	Distress	-.097	.045	4.611	1	.032	.908	.831	.992
	Constant	2.588	.417	38.577	1	<.001			

Table 10. Hypothesis C1: T-Tests Comparing "Successful"(S) and "Unsuccessful" (US) Participants as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL	Age	US	154	51.69	13.297	-.588	558	.577
		S	406	52.35	12.299			
	Chronicity	US	148	99.16	109.274	.275	532	.783
		S	386	96.27	108.302			
	Physician Visits	US	152	10.28	9.516	.385	553	.700
		S	403	9.94	8.926			
	ER Visits	US	150	.87	1.657	-.817	553	.414
		S	405	1.00	1.768			
	MH Visits	US	153	3.76	7.383	.045	557	.964
		S	406	3.73	7.402			
	Treatment Procedures	US	153	2.01	2.020	.194	557	.846
		S	406	1.97	2.243			
	Diagnostic Procedures	US	154	2.38	2.711	.450	556	.653
		S	404	2.28	2.000			
	Surgeries	US	153	.73	1.610	.751	557	.453
		S	406	.63	1.399			
	Hours Resting	US	153	4.93	2.846	-1.106	559	.269
		S	408	5.25	3.035			
	Control	US	154	7.07	2.597	1.563	561	.119
		S	409	6.68	2.625			
	BDI-II	US	154	19.31	9.908	-1.634	561	.103
		S	409	20.90	10.434			
	BAI	US	154	15.01	9.851	-1.654	561	.099
		S	409	16.58	10.178			
	Physical Health	US	154	25.81	6.240	1.472	561	.142
		S	409	24.92	6.388			
	Walking	US	100	15.92	5.406	1.662	456	.097
		S	358	14.93	5.206			
	Standing	US	101	15.31	7.319	1.207	137.899	.229
		S	358	14.35	5.840			

MH=Mental Health

Table 10 (continued). Hypothesis C1: T-Tests Comparing "Successful"(S) and "Unsuccessful" (US) Participants as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL (cont.)	Pain	US	154	8.54	2.081	.695	561	.487
		S	409	8.40	2.207			
	Interference	US	154	9.36	2.750	-2.299	240.408	.022
		S	409	9.93	2.332			
	Distress	US	154	6.75	3.157	-1.219	561	.224
		S	409	7.11	3.133			

Table 10 (continued). Hypothesis C1: T-Tests Comparing "Successful"(S) and "Unsuccessful" (US) Participants as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP	Age	US	50	48.12	11.455	-2.023	314	.044
		S	266	51.81	11.897			
	Chronicity	US	46	89.17	119.236	-.240	292	.811
		S	248	93.41	108.324			
	Physician Visits	US	49	12.65	12.267	1.246	58.760	.218
		S	267	10.36	9.392			
	ER Visits	US	48	1.33	2.452	.505	311	.614
		S	265	1.18	1.869			
	MH Visits	US	50	3.94	6.744	.077	314	.939
		S	266	3.86	7.036			
	Treatment Procedures	US	50	1.78	2.033	-.790	315	.430
		S	267	2.06	2.311			
	Diagnostic Procedures	US	50	2.36	2.008	-.340	313	.734
		S	265	2.47	2.071			
	Surgeries	US	49	.94	1.875	.948	55.366	.347
		S	268	.68	1.197			
	Hours Resting	US	50	6.26	2.724	.407	316	.684
		S	268	6.07	2.998			
	Control	US	50	6.50	2.697	.867	317	.387
		S	269	6.16	2.520			
	BDI-II	US	50	23.04	9.994	.258	317	.797
		S	269	22.64	10.105			
	BAI	US	50	17.20	9.190	-.489	317	.625
		S	269	17.94	9.948			
	Physical Health	US	50	23.76	4.702	.223	317	.823
		S	269	23.58	5.326			
	Walking	US	49	15.18	5.453	.606	314	.545
		S	267	14.69	5.165			
	Standing	US	50	14.70	8.222	.605	57.760	.547
		S	267	13.97	5.587			
	Pain	US	50	9.14	1.641	1.342	317	.181
		S	269	8.75	1.902			

MH=Mental Heath

Table 10 (continued). Hypothesis C1: T-Tests Comparing "Successful"(S) and "Unsuccessful" (US) Participants as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP (Cont.)	Interference	US	50	10.46	1.752	.142	317	.887
		S	269	10.42	2.029			
	Distress	US	50	7.30	2.859	-.584	317	.559
		S	269	7.57	2.961			

Table 10 (continued). Hypothesis C1: T-Tests Comparing "Successful"(S) and "Unsuccessful" (US) Participants as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP	Age	US	10	51.60	13.268	.382	39	.705
		S	31	49.90	11.892			
	Chronicity	US	10	123.80	115.396	.246	39	.807
		S	31	114.10	106.366			
	Physician Visits	US	10	14.40	14.714	.853	37	.399
		S	29	11.31	7.705			
	ER Visits	US	10	.60	1.265	-.733	39	.468
		S	31	1.19	2.442			
	MH Visits	US	9	3.22	5.167	-.427	38	.672
		S	31	4.42	7.894			
	Treatment Procedures	US	10	2.00	1.886	.532	39	.598
		S	31	1.65	1.817			
	Diagnostic Procedures	US	10	2.50	2.593	.443	39	.661
		S	31	2.16	1.934			
	Surgeries	US	10	.30	.675	-.523	38	.604
		S	30	.50	1.137			
	Hours Resting	US	10	4.30	2.163	.021	39	.991
		S	31	4.29	2.298			
	Control	US	10	7.40	2.413	.615	39	.542
		S	31	6.87	2.349			
	BDI-II	US	10	19.80	8.954	-.583	39	.563
		S	31	22.19	11.904			
	BAI	US	10	12.50	6.115	-2.075	31.823	.046
		S	31	18.61	12.374			
	Physical Health	US	10	25.40	4.812	1.824	39	.076
		S	31	22.00	5.215			
	Walking	US	10	16.00	2.828	1.493	39	.144
		S	31	13.45	5.124			
	Standing	US	10	15.00	4.643	1.660	39	.105
		S	31	12.65	3.647			
	Pain	US	10	8.10	1.101	-1.474	39	.149
		S	31	8.90	1.599			

MH=Mental Health

Table 10 (continued). Hypothesis C1: T-Tests Comparing "Successful"(S) and "Unsuccessful" (US) Participants as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP (cont.)	Interference	US	10	9.10	2.923	-1.477	10.387	.169
		S	31	10.52	1.411			
	Distress	US	10	7.10	2.470	-.316	39	.753
		S	31	7.42	2.861			

Table 10 (continued). Hypothesis C1: T-Tests Comparing "Successful"(S) and "Unsuccessful" (US) Participants as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT	Age	US	94	53.60	13.936	-.409	201	.683
		S	109	54.38	13.193			
	Chronicity	US	92	101.48	104.014	.245	197	.807
		S	107	97.76	109.284			
	Physician Visits	US	93	8.58	6.417	.038	198	.970
		S	107	8.54	7.889			
	ER Visits	US	92	.65	1.032	.860	199	.391
		S	109	.52	1.085			
	MH Visits	US	94	3.71	7.924	.443	201	.658
		S	109	3.21	8.137			
	Treatment Procedures	US	93	2.14	2.036	.930	199	.353
		S	108	1.86	2.185			
	Diagnostic Procedures	US	94	2.37	3.051	1.477	200	.141
		S	108	1.86	1.780			
	Surgeries	US	94	.67	1.527	.513	200	.609
		S	109	.55	1.861			
	Hours Resting	US	93	4.29	2.749	2.205	200	.029
		S	109	3.49	2.433			
	Control	US	94	7.34	2.538	-1.637	201	.103
		S	109	7.93	2.548			
	BDI-II	US	94	17.28	9.458	.775	201	.439
		S	109	16.25	9.417			
	BAI	US	94	14.11	10.366	1.061	201	.290
		S	109	12.66	9.049			
	Physical Health	US	94	26.94	6.828	-2.149	201	.033
		S	109	29.06	7.208			
	Walking	US	41	16.78	5.781	.013	99	.990
		S	60	16.77	5.053			
	Standing	US	41	16.12	6.716	-.590	99	.556
		S	60	16.95	7.058			
	Pain	US	94	8.27	2.30	2.535	201	.012
		S	109	7.37	2.693			

MH=Mental Health

Table 10 (continued). Hypothesis C1: T-Tests Comparing "Successful"(S) and "Unsuccessful" (US) Participants as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT (cont.)	Interference	US	94	8.80	3.004	.574	201	.567
		S	109	8.57	2.685			
	Distress	US	94	6.43	3.349	1.082	201	.281
		S	109	5.92	3.325			

Table 11. Hypothesis C1: Predictors of Success as Defined by Self-Reported Improvement of "Very Much" or "Much" Improved at Post-Treatment.

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
ALL	Interference	.090	.037	5.980	1	.014	1.095	1.018	1.177
	Constant	.104	.365	.081	1	.776	1.110		
COP	Age	.026	.013	4.000	1	.045	1.027	1.001	1.053
	Constant	.357	.659	.293	1	.588	1.429		
MCOP	Interference	.359	.192	3.505	1	.061	1.431	.983	2.083
	Constant	-2.416	1.897	1.622	1	.203	.089		
FIT	Pain	-.144	.058	6.113	1	.013	.866	.773	.971
	Constant	1.273	.480	7.034	1	.008	3.570		

Table 12. Hypothesis C2: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Depression from Pre- to Post-treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL	Age	US	233	52.68	13.111	2.673	760	.008
		S	529	50.06	12.141			
	Chronicity	US	219	93.40	110.104	.135	719	.893
		S	502	92.21	108.428			
	Physician Visits	US	215	9.82	10.195	-.222	715	.825
		S	502	9.98	8.675			
	ER Visits	US	227	.80	1.521	-2.052	517.281	.041
		S	504	1.06	1.828			
	MH Visits	US	224	3.08	7.714	-1.030	728	.303
		S	506	3.68	6.968			
	Treatment Procedures	US	229	1.87	2.056	-.928	751	.354
		S	524	2.04	2.391			
	Diagnostic Procedures	US	227	2.45	2.042	1.164	746	.245
		S	521	2.24	2.361			
	Surgeries	US	230	.92	2.326	1.725	747	.085
		S	519	.66	1.617			
	Hours Resting	US	231	4.85	2.800	-2.880	476.844	.004
		S	528	5.51	3.063			
	Pain	US	233	8.48	2.101	-.718	762	.473
		S	531	8.60	2.091			
	Interference	US	233	9.39	2.867	-3.683	344.507	<.001
		S	531	10.15	2.089			
	Distress	US	233	6.40	3.258	-4.966	762	<.001
		S	531	7.60	2.991			
	Control	US	233	7.30	2.617	4.786	761	<.001
		S	530	6.34	2.494			
	BDI-II	US	233	15.30	10.177	-10.601	764	<.001
		S	533	23.47	9.644			
	BAI	US	233	13.67	8.622	-5.621	544.494	<.001
		S	532	17.78	10.739			

MH=Mental Health

Table 12 (continued). Hypothesis C2: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Depression from Pre- to Post-treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL (cont.)	Physical Health	US	233	26.10	6.911	3.768	370.495	<.001
		S	529	24.17	5.571			
	Walking	US	187	15.64	5.640	1.007	658	.314
		S	473	15.15	5.638			
	Standing	US	186	14.47	6.059	-.375	659	.708
		S	475	14.69	7.151			

Table 12 (continued). Hypothesis C2: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Depression from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP	Age	US	129	50.64	12.000	.933	515	.315
		S	388	49.51	11.903			
	Chronicity	US	116	80.47	101.805	-.885	477	.376
		S	363	90.86	112.568			
	Physician Visits	US	112	11.22	11.991	.940	150.699	.349
		S	365	10.07	8.934			
	ER Visits	US	124	1.10	1.860	-.263	486	.793
		S	364	1.16	1.906			
	MH Visits	US	121	2.94	6.471	-1.022	484	.307
		S	365	3.68	6.974			
	Treatment Procedures	US	125	1.91	2.052	-.494	508	.621
		S	385	2.03	2.494			
	Diagnostic Procedures	US	123	2.63	2.078	1.378	502	.169
		S	381	2.31	2.231			
	Surgeries	US	126	1.11	2.540	1.917	504	.056
		S	380	.72	1.736			
	Hours Resting	US	128	5.53	2.929	-1.864	513	.063
		S	387	6.10	3.000			
	Pain	US	129	8.95	1.769	.659	517	.510
		S	390	8.82	1.902			
	Interference	US	129	10.22	2.226	-1.027	517	.305
		S	390	10.44	1.952			
	Distress	US	129	6.99	3.215	-2.877	517	.004
		S	390	7.86	2.867			
	Control	US	129	6.71	2.498	2.570	519	.010
		S	390	6.06	2.468			
	BDI-II	US	129	17.51	10.815	-6.779	519	<.001
		S	392	24.35	9.639			
	BAI	US	129	15.30	8.775	-3.526	259.351	<.001
		S	391	18.62	10.531			

MH=Mental Health

Table 12 (continued). Hypothesis C2: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Depression from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP (cont.)	Physical Health	US	129	24.14	5.873	1.271	191.053	.205
		S	388	23.41	4.913			
	Walking	US	129	15.07	5.715	.005	515	.996
		S	388	15.07	5.694			
	Standing	US	128	13.62	6.054	-1.240	516	.216
		S	390	14.47	6.931			

Table 12 (continued). Hypothesis C2: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Depression from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP	Age	US	13	48.54	12.804	-.412	41	.682
		S	30	50.23	12.196			
	Chronicity	US	13	116.69	121.920	.066	41	.948
		S	30	114.37	99.347			
	Physician Visits	US	13	14.69	13.931	1.017	14.941	.325
		S	28	10.54	7.063			
	ER Visits	US	13	.38	.870	-1.895	39.888	.065
		S	30	1.37	2.512			
	MH Visits	US	12	3.67	10.334	-.161	40	.873
		S	30	4.07	5.723			
	Treatment Procedures	US	13	1.46	1.613	-.663	41	.511
		S	30	1.87	1.925			
	Diagnostic Procedures	US	13	2.08	2.397	-.325	41	.747
		S	30	2.30	1.915			
	Surgeries	US	13	.46	.967	.139	40	.890
		S	29	.41	1.053			
	Hours Resting	US	13	5.15	2.035	1.658	41	.105
		S	30	3.97	2.205			
	Pain	US	13	8.54	1.450	-.457	41	.650
		S	30	8.77	1.524			
	Interference	US	13	9.54	3.357	-.750	14.143	.466
		S	30	10.27	1.507			
	Distress	US	13	6.77	2.713	-.914	41	.366
		S	30	7.60	2.749			
	Control	US	13	7.62	2.534	1.251	41	.218
		S	30	6.67	2.171			
	BDI-II	US	13	14.54	8.838	-2.688	41	.010
		S	30	23.90	11.099			

MH=Mental Health

Table 12 (continued). Hypothesis C2: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Depression from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP (cont.)	BAI	US	13	12.00	7.071	-1.956	41	.057
		S	30	19.03	12.047			
	Physical Health	US	13	25.62	4.857	2.320	41	.025
		S	30	21.80	4.992			
	Walking	US	13	16.08	3.523	1.752	41	.087
		S	30	13.40	4.980			
	Standing	US	13	15.38	4.556	2.056	41	.046
		S	30	12.67	3.717			

Table 12 (continued). Hypothesis C2: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Depression from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT	Age	US	44	56.05	14.932	1.505	96	.136
		S	54	51.87	12.529			
	Chronicity	US	44	85.25	108.698	-.310	96	.757
		S	54	91.83	101.220			
	Physician Visits	US	44	8.11	6.154	-.545	95	.587
		S	53	8.92	8.114			
	ER Visits	US	44	.59	1.019	.153	96	.879
		S	54	.56	1.223			
	Mental Health Visits	US	44	2.84	4.109	-.735	80.167	.465
		S	54	3.80	8.401			
	Treatment Procedures	US	44	1.91	2.197	-.071	95	.943
		S	53	1.94	2.476			
	Diagnostic Procedures	US	44	2.55	2.129	2.253	76.575	.027
		S	53	1.68	1.541			
	Surgeries	US	44	.84	2.753	.979	95	.330
		S	53	.45	.798			
	Hours Resting	US	44	4.27	2.481	.563	96	.575
		S	54	3.98	2.603			
	Pain	US	44	7.84	2.449	.493	96	.623
		S	54	7.59	2.507			
	Interference	US	44	8.50	2.953	-.731	96	.467
		S	54	8.91	2.564			
	Distress	US	44	5.45	3.560	-1.465	96	.146
		S	54	6.48	3.363			
	Control	US	44	8.09	2.604	1.465	96	.146
		S	54	7.30	2.724			
	BDI-II	US	44	12.61	8.568	-4.214	96	<.001
		S	54	19.87	8.405			
	BAI	US	44	11.80	9.222	-1.342	96	.183
		S	54	14.69	11.598			

MH=Mental Health

Table 12 (continued). Hypothesis C2: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Depression from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT (cont.)	Physical Health	US	44	27.80	7.466	.121	96	.904
		S	54	27.63	6.153			
	Walking	US	44	16.98	5.696	.212	96	.832
		S	54	16.74	5.314			
	Standing	US	44	16.39	5.840	-.789	90.989	.432
		S	54	17.59	9.193			

Table 13. Hypothesis C2: Predictors of Success as Defined by At Least a 20% Decrease in Depression from Pre- to Post-Treatment

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
All (with BDI-II)	BDI-II	.092	.010	86.654	1	.001	1.09	1.075	1.118
	Constant	-.929	.193	23.260	1	.001	.395		
All (no BDI-II)	Distress	.123	.026	23.302	1	.001	1.131	1.076	1.189
	Constant	-.040	.191	.045	1	.833	.960		
COP (with BDI-II)	BDI-II	.077	.012	39.631	1	.001	1.081	1.055	1.107
	Stand	.040	-017	5.250	1	.022	1.041	1.006	1.077
	Constant	-1.075	.382	7.935	1	.005	.341		
COP (no BDI-II)	BAI	.032	.011	8.445	1	.004	1.032	1.010	1.055
	Constant	.560	.205	7.435	1	.006	1.751		
MCOP	Physician Visits	-.110	.050	4.847	1	.028	.896	.813	.968
(with BDI-II)	BDI-II	.184	.072	6.586	1	.010	1.202	1.044	1.383
	Stand	-.437	.158	7.705	1	.006	.646	.474	.879
	Constant	4.998	2.267	4.862	1	.027	148.114		
MCOP (no BDI-II)	Stand	-.194	.093	4.360	1	.037	.824	.687	.988
	Constant	3.437	1.355	6.434	1	.011	31.079		
FIT	Diag. proc.	-.420	.147	8.107	1	.004	.657	.492	.877
(with BDI-II)	BDI-II	.122	.031	15.482	1	.001	1.130	1.063	1.201
	Constant	-.909	.523	3.025	1	.082	.403		
FIT	Diag. proc.	-.266	.121	4.829	1	.028	.767	.605	.972
(no BDI-II)	Constant	.737	.324	5.172	1	.023	2.089		

Table 14. Hypothesis C3: Comparisons of "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	*t*	df	Sig.
ALL	Age	US	189	50.10	13.024	-.358	662	.721
		S	475	50.47	11.913			
	Chronicity	US	183	96.21	107.70	.877	625	.381
		S	444	87.78	110.17			
	Physician Visits	US	173	9.51	6.963	-1.233	457.861	.218
		S	443	10.40	10.235			
	ER Visits	US	181	.89	1.782	-1.384	630	.167
		S	451	1.11	1.832			
	MH Visits	US	178	3.41	7.254	-.153	626	.878
		S	450	3.50	6.583			
	Treatment Procedures	US	183	1.86	2.547	-.756	651	.450
		S	470	2.01	2.270			
	Diagnostic Procedures	US	183	2.28	2.250	-.313	645	.754
		S	464	2.34	2.095			
	Surgeries	US	185	.65	1.754	-.769	648	.442
		S	465	.78	1.945			
	Hours Resting	US	188	4.89	2.967	-3.615	655	<.001
		S	469	5.81	2.939			
	Pain	US	188	8.30	2.062	-3.200	663	.001
		S	477	8.84	1.910			
	Interference	US	188	9.38	2.619	-4.709	282.393	<.001
		S	477	10.39	2.056			
	Distress	US	188	7.10	3.063	-1.534	663	.126
		S	477	7.50	3.071			
	Control	US	188	6.66	2.556	1.056	661	.291
		S	475	6.43	2.568			
	BDI-II	US	189	19.19	9.234	-4.020	401.47	<.001
		S	475	22.54	10.807			
	BAI	US	189	15.54	10.159	-2.351	661	.019
		S	474	17.65	10.511			

MH=Mental Health

Table 14 (continued). Hypothesis C3: Comparisons of "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL	Physical	US	188	25.86	6.056	4.630	658	<.001
(cont.)	Health	S	472	23.62	5.400			
	Walk	US	189	18.85	4.895	10.85	667	<.001
		S	480	13.99	5.332	4		
	Stand	US	189	17.99	7.269	8.124	667	<.001
		S	480	13.44	6.206			

Table 14 (continued). Hypothesis C3: Comparisons of "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP	Age	US	115	48.03	12.005	-1.761	516	.079
		S	403	50.23	11.794			
	Chronicity	US	110	89.39	110.209	.108	480	.914
		S	372	88.09	111.439			
	Physician Visits	US	100	9.83	7.516	-.660	471	.509
		S	373	10.56	10.308			
	ER Visits	US	107	1.03	1.881	-.683	484	.495
		S	379	1.17	1.884			
	MH Visits	US	105	3.10	6.769	-.617	481	.538
		S	378	3.56	6.767			
	Treatment Procedures	US	110	1.92	2.696	-.463	506	.643
		S	398	2.04	2.305			
	Diagnostic Procedures	US	110	2.45	2.485	.346	500	.730
		S	392	2.37	2.113			
	Surgeries	US	112	.62	1.384	-1.134	503	.257
		S	393	.85	2.077			
	Hours Resting	US	115	5.59	3.078	-1.453	510	.147
		S	397	6.05	2.956			
	Pain	US	114	8.47	1.882	-2.585	517	.010
		S	405	8.97	1.804			
	Interference	US	114	9.87	2.494	-2.600	151.76	.010
		S	405	10.52	1.899			
	Distress	US	114	7.51	2.937	-.592	517	.554
		S	405	7.69	2.951			
	Control	US	114	6.30	2.453	.330	515	.742
		S	403	6.21	2.510			
	BDI-II	US	115	20.50	9.554	-2.502	516	.013
		S	403	23.24	10.545			

MH=Mental Health

Table 14 (continued). Hypothesis C3: Comparisons of "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	*t*	df	Sig.
COP (cont.)	BAI	US	115	16.30	9.978	-1.701	515	.090
		S	402	18.14	10.297			
	Physical Health	US	114	24.84	5.619	2.724	512	.007
		S	400	23.35	5.043			
	Walk	US	115	19.46	4.919	9.978	521	<.001
		S	408	13.95	5.311			
	Stand	US	115	18.02	7.019	6.904	521	<.001
		S	408	13.32	6.268			

Table 14 (continued). Hypothesis C3: Comparisons of "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP	Age	US	12	52.83	16.112	1.063	39	.294
		S	29	48.28	10.743			
	Chronicity	US	12	157.17	117.941	1.983	39	.054
		S	29	91.52	86.560			
	Physician Visits	US	12	10.83	4.407	-.596	37	.555
		S	27	12.89	11.507			
	ER Visits	US	12	1.25	2.896	.234	39	.816
		S	29	1.07	1.944			
	MH Visits	US	11	5.73	11.244	.626	11.75	.543
		S	29	3.52	5.336			
	Treatment Procedures	US	12	1.67	1.775	-.089	39	.930
		S	29	1.72	1.925			
	Diagnostic Procedures	US	12	1.75	1.215	-1.453	36.31	.261
		S	29	2.55	2.293			
	Surgeries	US	12	.75	1.055	1.258	39	.216
		S	29	.31	1.004			
	Hours Resting	US	12	4.00	2.558	-.470	39	.641
		S	29	4.34	1.951			
	Pain	US	12	8.42	1.379	-1.297	39	.202
		S	29	9.00	1.282			
	Interference	US	12	9.08	2.353	-1.856	39	.071
		S	29	10.48	2.132			
	Distress	US	12	7.17	2.443	-.326	39	.746
		S	29	7.48	2.959			
	Control	US	12	6.58	2.315	-.727	39	.471
		S	29	7.17	2.377			
	BDI-II	US	12	21.00	8.676	.035	39	.973
		S	29	20.86	12.377			
	BAI	US	12	16.67	5.219	-.208	39	.836
		S	29	17.48	5.307			

MH=Mental Health

Table 14 (continued). Hypothesis C3: Comparisons of "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP (cont.)	Physical Health	US	12	23.83	3.664	.821	39	.417
		S	29	22.34	4.995			
	Walk	US	12	15.83	3.664	1.556	39	.128
		S	29	13.34	4.995			
	Stand	US	12	14.92	4.522	1.385	39	.174
		S	29	12.93	4.035			

Table 14 (continued). Hypothesis C3: Comparisons of "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT	Age	US	62	53.40	13.638	-.301	103	.764
		S	43	54.21	13.235			
	Chronicity	US	61	96.51	98.695	.663	102	.509
		S	43	82.53	115.262			
	Physician Visits	US	61	8.72	6.409	.913	102	.364
		S	43	7.42	8.131			
	ER Visits	US	62	.58	1.249	-.199	103	.842
		S	43	.63	1.113			
	MH Visits	US	62	3.53	7.260	.384	103	.702
		S	43	3.02	5.755			
	Treatment Procedures	US	61	1.79	2.423	-.409	102	.683
		S	43	1.98	2.188			
	Diagnostic Procedures	US	61	2.08	1.926	.409	102	.683
		S	43	1.93	1.765			
	Surgeries	US	61	.70	2.383	.700	102	.486
		S	43	.44	.734			
	Hours Resting	US	61	3.74	2.408	-1.607	102	.111
		S	43	4.56	2.771			
	Pain	US	62	7.95	2.439	1.024	103	.308
		S	43	7.44	2.603			
	Interference	US	62	8.55	2.708	-.865	103	.398
		S	43	9.02	2.849			
	Distress	US	62	6.32	3.283	.912	103	.364
		S	43	5.70	3.687			
	Control	US	62	7.35	2.680	-1.219	103	.226
		S	43	8.00	2.646			
	BDI-II	US	62	16.39	8.171	-.411	103	.682
		S	43	17.14	10.569			
	BAI	US	62	13.90	10.706	.387	103	.699
		S	43	13.09	10.304			

MH=Mental Health

Table 14 (continued). Hypothesis C3: Comparisons of "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT (cont.)	Physical Health	US	62	28.11	6.412	.777	103	.439
		S	43	27.07	7.249			
	Walk	US	62	18.31	4.837	3.362	103	.001
		S	43	14.81	5.762			
	Stand	US	62	18.55	8.057	2.418	103	.017
		S	43	14.93	6.717			

Table 15. Hypothesis C3: Predictors of Success as Defined by At Least a 20% Increase in Walking Ability from Pre- to Post-Treatment.

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
All (with walk)	BDI-II	.031	.010	10.494	1	.001	1.031	1.012	1.051
	Walk	-.182	.020	81.430	1	.001	.834	.802	.868
	Constant	3.261	.430	65.448	1	.001	26.081		
All (no walk)	Stand	-.094	.014	44.469	1	.001	.910	.885	.936
	Distress	.150	.039	14.988	1	.001	1.161	1.077	1.253
	Constant	.902	.463	3.792	1	.052	2.464		
COP (with walk)	BDI-II	.024	.012	4.022	1	.045	1.024	1.001	1.049
	Walk	-.203	.025	65.506	1	.001	.816	.777	.858
	Constant	4.119	.524	61.661	1	.001	61.471		
COP (no walk)	Stand	-.099	.016	37.877	1	.001	.906	.878	.935
	Constant	2.795	.284	96.769	1	.001	16.360		
MCOP (with walk)	Walk	15.735	1507.368	.000	1	.992	61816474.44	.000	--
	Constant	-158.44	15073.682	.000	1	.992	.000		
MCOP (no walk)	†								
FIT (with walk)	Walk	-.127	.041	9.452	1	.002	.881	.812	.955
	Constant	1.747	.712	6.025	1	.014	5.738		
FIT (no walk)	Stand	-.077	.034	5.192	1	.028	.926	.867	.989
	Constant	.903	.575	2.463	1	.117	2.467		

†All variables were excluded from the statistical model.

Table 16. Hypothesis C3: T-Test Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Walking 15 or More Laps at Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL	Age	US	88	56.31	13.042	4.981	662	<.001
		S	576	49.46	11.854			
	Chronicity	US	87	91.37	107.726	.105	116.679	.916
		S	540	90.06	109.806			
	Physician Visits	US	85	9.99	9.520	-.166	614	.868
		S	531	10.17	9.429			
	ER Visits	US	87	1.16	2.073	.626	630	.532
		S	545	1.03	1.777			
	MH Visits	US	89	2.12	3.988	-3.019	195.743	.003
		S	539	3.70	7.109			
	Treatment Procedures	US	90	1.84	2.203	-.543	651	.587
		S	563	1.99	2.373			
	Diagnostic Procedures	US	87	1.95	1.952	-1.747	645	.081
		S	560	2.38	2.162			
	Surgeries	US	90	.77	1.374	.119	648	.905
		S	560	.74	1.964			
	Hours Resting	US	90	6.02	2.953	1.641	655	.101
		S	567	5.47	2.973			
	Pain	US	89	8.79	2.129	.527	663	.599
		S	576	8.67	1.943			
	Interference	US	89	10.10	2.122	-.005	663	.996
		S	576	10.10	2.297			
	Distress	US	89	7.07	3.614	-.915	107.274	.362
		S	576	7.44	2.980			
	Control	US	89	6.56	2.840	.253	661	.800
		S	574	6.49	2.522			
	BDI-II	US	89	20.63	11.046	-.925	662	.355
		S	575	21.73	10.400			
	BAI	US	89	18.49	9.579	1.407	661	.160
		S	574	16.82	10.566			

MH=Mental Health

Table 16 (continued). Hypothesis C3: T-Test Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Walking 15 or More Laps at Post-Treatment

Prog.	Variable	Status	N	Mean	SD	*t*	df	Sig.
ALL (cont.)	Perceived Health	US	89	23.48	4.712	-1.387	658	.166
		S	571	24.38	5.811			
	Walk	US	90	8.03	3.262	-21.026	164.403	<.001
		S	579	16.51	5.057			
	Stand	US	90	10.30	4.663	-9.007	156.288	<.001
		S	579	15.42	6.862			

Table 16 (continued). Hypothesis C3: T-Test Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Walking 15 or More Laps at Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP	Age	US	59	54.66	12.015	3.418	516	.001
		S	459	49.11	11.709			
	Chronicity	US	58	76.07	91.667	-.901	480	.368
		S	424	90.07	113.429			
	Physician Visits	US	56	10.50	10.607	.078	471	.938
		S	417	10.39	9.679			
	ER	US	58	1.10	1.962	-.148	484	.882
		S	428	1.14	1.873			
	MH Visits	US	60	2.28	3.992	-2.162	119.595	.033
		S	423	3.62	7.056			
	Treatment Procedures	US	61	1.62	1.934	-1.354	506	.176
		S	447	2.06	2.445			
	Diagnostic Procedures	US	58	2.03	2.017	-1.313	500	.190
		S	444	2.44	2.218			
	Surgeries	US	61	.85	1.459	.224	503	.823
		S	444	.79	2.005			
	Hours Resting	US	61	6.61	2.865	1.841	510	.066
		S	451	5.86	2.995			
	Pain	US	60	8.92	2.227	.202	69.156	.810
		S	459	8.86	1.776			
	Interference	US	60	10.32	2.175	-.251	517	.802
		S	459	10.39	2.047			
	Distress	US	60	7.53	3.466	-.290	70.015	.773
		S	459	7.67	2.875			
	Control	US	60	6.12	2.744	-.374	515	.708
		S	457	6.25	2.464			
	BDI-II	US	60	22.65	11.769	.015	516	.988
		S	458	22.63	10.206			
	BAI	US	60	19.62	9.433	1.515	515	.130
		S	457	17.49	10.332			

MH=Mental Health

Table 16 (continued). Hypothesis C3: T-Test Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Walking 15 or More Laps at Post-Treatment

Prog.	Variable	Status	N	Mean	SD	*t*	df	Sig.
COP (cont.)	Perceived Health	US S	60 454	22.83 23.79	4.311 5.309	-1.336	512	.182
	Walk	US S	61 462	7.89 16.13	3.225 5.244	-17.179	107.492	<.001
	Stand	US S	61 462	9.59 14.98	4.731 6.697	-7.920	95.082	<.001

Table 16 (continued). Hypothesis C3: T-Test Comparing "Successful" (S) and
"Unsuccessful" (US) Participants, With Success Defined as Walking 15 or More Laps at
Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP	Age	US	7	45.71	10.950	-.902	39	.372
		S	34	50.41	12.811			
	Chronicity	US	7	98.86	100.604	-.341	39	.735
		S	34	113.2	101.125			
	Physician Visits	US	7	13.71	8.200	.427	37	.672
		S	32	11.94	10.270			
	ER Visits	US	7	3.41	4.100	1.555	6.284	.169
		S	34	.71	1.382			
	MH Visits	US	7	2.43	3.259	-.669	38	.508
		S	33	4.48	7.930			
	Treatment Procedures	US	7	1.86	1.676	.231	39	.818
		S	34	1.68	1.918			
	Diagnostic Procedures	US	7	2.29	2.430	-.044	39	.965
		S	34	2.32	2.011			
	Surgeries	US	7	.86	1.864	.703	6.432	.507
		S	34	.35	.774			
	Hours Resting	US	7	3.57	2.507	-.920	39	.363
		S	34	4.38	2.045			
	Pain	US	7	9.14	.690	1.061	18.388	.302
		S	34	8.76	1.415			
	Interference	US	7	10.71	.756	1.522	32.419	.138
		S	34	9.94	2.449			
	Distress	US	7	6.29	2.812	-1.154	39	.255
		S	34	7.62	2.775			
	Control	US	7	6.86	2.035	-175	39	.862
		S	34	7.03	2.431			
	BDI-II	US	7	18.00	8.021	-.731	39	.469
		S	34	21.50	12.074			
	BAI	US	7	16.86	11.187	-.098	39	.922
		S	34	17.32	11.488			

MH=Mental Health

Table 16 (continued). Hypothesis C3: T-Test Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Walking 15 or More Laps at Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP (cont.)	Perceived Health	US	7	20.86	2.911	-1.064	39	.294
		S	34	23.18	5.573			
	Walk	US	7	6.14	3.934	-7.502	39	<.001
		S	34	15.71	2.887			
	Stand	US	7	11.14	3.891	-1.665	39	.104
		S	34	14.00	4.178			

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Table 16 (continued). Hypothesis C3: T-Test Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Walking 15 or More Laps at Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT	Age	US	22	64.09	12.776	4.421	103	.000
		S	83	50.99	12.250			
	Chronicity	US	22	129.3	140.184	1.958	102	.053
		S	82	80.4	92.504			
	Physician Visits	US	22	7.50	6.069	-.502	102	.617
		S	82	8.37	7.451			
	ER Visits	US	22	.68	.894	.361	103	.719
		S	83	.58	1.260			
	MH Visits	US	22	1.59	4.295	-1.822	55.118	.074
		S	83	3.78	7.107			
	Treatment Procedures	US	22	2.45	2.923	1.122	27.221	.272
		S	82	1.71	2.123			
	Diagnostic Procedures	US	22	1.64	1.649	-1.092	102	.277
		S	82	2.12	1.901			
	Surgeries	US	22	.50	.913	-.269	102	.789
		S	82	.62	2.071			
	Hours Resting	US	22	5.18	2.822	2.306	102	.023
		S	82	3.78	2.450			
	Pain	US	22	8.32	2.147	1.213	103	.228
		S	83	7.59	2.585			
	Interference	US	22	9.32	2.124	1.100	103	.274
		S	83	8.59	2.901			
	Distress	US	22	6.05	4.100	-.032	103	.974
		S	83	6.07	3.286			
	Control	US	22	7.68	3.092	.123	103	.902
		S	83	7.60	2.571			
	BDI-II	US	22	15.95	8.179	-.424	103	.673
		S	83	16.89	9.473			
	BAI	US	22	15.95	9.353	1.200	103	.233
		S	83	12.94	10.748			

MH=Mental Health

Table 16 (continued). Hypothesis C3: T-Test Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Walking 15 or More Laps at Post-Treatment

Prog.	Variable	Status	N	Mean	SD	*t*	df	Sig.
FIT (cont.)	Perceived Health	US	22	26.09	5.273	-1.249	103	.214
		S	83	28.11	7.061			
	Walk	US	22	9.05	2.935	-11.108	103	<.001
		S	83	18.95	3.895			
	Stand	US		12.00	4.375	-3.667	103	<.001
		S		18.41	7.863			

Table 17. Hypothesis C3: Predictors of Success as Defined by Walking 15 or More Laps at Post-Treatment

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
All (with walk)	Age	-.037	.013	8.720	1	.003	.963	.940	.988
	Walk	.435	.044	99.543	1	.001	1.545	1.418	1.683
	Constant	-1.232	.781	2.488	1	.115	.292		
All (no walk)	Age	-.051	.011	21.544	1	.001	.950	.930	.971
	Stand	.181	.028	40.953	1	.001	1.199	1.134	1.267
	Constant	2.320	.656	12.506	1	.001	10.173		
COP (with walk)	Walk	.418	.050	10.782	1	.001	1.518	1.377	1.673
	Constant	-2.728	.487	31.384	1	.001	.065		
COP (no walk)	Age	-.038	.015	6.566	1	.010	.963	.936	.991
	Stand	.242	.040	36.671	1	.001	1.273	1.178	1.377
	Constant	1.171	.841	1.939	1	.164	3.225		
MCOP (with walk)	Walk	15.735	1507.368	.000	1	.992	6816474.441	.000	--
	Constant	-158.44	15073682	.000	1	.992	.000		
MCOP (no walk)	†								
FIT (with walk)	Walk	.813	.199	16.717	1	<.001	2.254	1.527	3.327
	Constant	-9.741	2.515	6.025	1	<.001	.000		
FIT (no walk)	Age	-.079	.026	9.458	1	.002	.924	.879	.972
	Stand	.188	.067	7.776	1	.005	1.207	1.057	1.378
	Constant	3.126	1.867	2.803	1	.094	22.793		

†All variables were excluded from the statistical model.

Table 18. Hypothesis C4: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Pain from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL	Age	US	372	50.77	12.169	-.109	762	.913
		S	392	50.87	12.748			
	Chronicity	US	352	102.50	120.552	2.412	668.551	.016
		S	372	82.94	95.490			
	Physician Visits	US	348	11.03	10.744	3.131	601.451	.002
		S	372	8.88	7.216			
	ER	US	358	.92	1.690	-.797	733	.426
		S	377	1.02	1.777			
	MH Visits	US	357	3.54	7.266	.116	731	.908
		S	376	3.48	7.136			
	Treatment Procedures	US	365	1.99	2.086	.044	754	.965
		S	391	1.99	2.480			
	Diagnostic Procedures	US	363	2.38	2.509	.885	750	.376
		S	389	2.23	2.009			
	Surgeries	US	364	.99	2.467	3.653	460.453	<.001
		S	389	.49	.941			
	Hours Resting	US	370	5.33	3.050	.190	760	.849
		S	392	5.29	2.959			
	Pain	US	373	8.20	2.205	-4.895	735.023	<.001
		S	396	8.93	1.897			
	Interference	US	373	9.73	2.533	-2.223	738.911	.026
		S	396	10.11	2.209			
	Distress	US	373	7.11	3.153	-1.114	767	.265
		S	396	7.36	3.093			
	Control	US	373	6.65	2.608	.318	766	.751
		S	395	6.59	2.534			

MH=Mental Health Visits

Table 18 (continued). Hypothesis C4: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Pain from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL (cont.)	BDI-II	US	372	21.09	10.675	.227	766	.821
		S	396	20.92	10.366			
	BAI	US	372	16.23	10.515	-.854	765	.394
		S	395	16.87	10.245			
	Perceived Health	US	372	25.03	6.198	.976	763	.330
		S	393	24.60	6.038			
	Walk	US	322	15.49	5.930	.614	664	.539
		S	344	15.22	5.393			
	Stand	US	323	14.71	7.308	.208	665	.836
		S	344	14.60	6.361			

Table 18 (continued). Hypothesis C4: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Pain from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP	Age	US	245	49.96	11.432	.422	517	.673
		S	274	49.52	12.286			
	Chronicity	US	227	100.89	128.48	2.364	394.936	.019
		S	255	76.84	88.616			
	Physician Visits	US	223	11.48	11.618	2.346	373.269	.020
		S	257	9.35	7.612			
	ER Visits	US	233	.99	1.735	-1.610	489.354	.108
		S	259	1.26	2.000			
	MH Visits	US	231	3.45	6.655	-.162	487	.872
		S	258	3.55	7.014			
	Treatment Procedures	US	239	1.94	2.100	-.658	511	.511
		S	274	2.08	2.622			
	Diagnostic Procedures	US	237	2.49	2.357	.979	506	.328
		S	271	2.30	2.043			
	Surgeries	US	239	1.10	2.630	3.068	299.389	.002
		S	271	.55	1.009			
	Hours Resting	US	244	6.09	2.984	1.060	516	.289
		S	274	5.81	3.004			
	Pain	US	246	8.48	2.003	-4.427	478.409	<.001
		S	278	9.20	1.667			
	Interference	US	246	10.30	2.101	-.859	522	.391
		S	278	10.45	1.959			
	Distress	US	246	7.57	3.005	-.647	522	.518
		S	278	7.74	2.938			
	Control	US	246	6.17	2.518	-.310	521	.757
		S	277	6.24	2.460			

MH=Mental Health

Table 18 (continued). Hypothesis C4: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Pain from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP (cont.)	BDI-II	US	245	22.94	10.843	.484	521	.629
		S	278	22.50	9.929			
	BAI	US	245	17.78	10.565	-.169	520	.866
		S	277	17.93	10.039			
	Perceived Health	US	245	23.84	5.276	.820	518	.413
		S	275	23.47	5.163			
	Walk	US	243	15.06	6.010	-.264	519	.792
		S	278	15.19	5.460			
	Stand	US	244	14.16	7.068	-.413	520	.679
		S	278	14.40	6.388			

Table 18 (continued). Hypothesis C4: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Pain from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP	Age	US	24	49.33	12.788	-.230	41	.819
		S	19	50.21	11.872			
	Chronicity	US	24	141.25	120.33	1.998	38.547	.053
		S	19	82.00	72.409			
	Physician Visits	US	24	14.13	11.782	2.067	31.830	.047
		S	17	8.65	4.595			
	ER	US	24	1.54	2.718	1.773	30.672	.086
		S	19	.47	1.020			
	MH Visits	US	23	3.91	8.067	-.038	40	.969
		S	19	4.00	6.209			
	Treatment Procedures	US	24	1.83	1.736	.356	41	.724
		S	19	1.63	1.978			
	Diagnostic Procedures	US	24	2.21	2.187	-.086	41	.932
		S	19	2.26	1.910			
	Surgeries	US	23	.61	1.196	1.335	36.704	.190
		S	19	.21	.713			
	Hours Resting	US	24	4.13	2.328	-.667	41	.508
		S	19	4.58	2.063			
	Pain	US	24	8.33	1.685	-1.856	41	.071
		S	19	9.16	1.068			
	Interference	US	24	9.54	2.245	-1.719	41	.093
		S	19	10.68	2.056			
	Distress	US	24	7.38	2.481	.070	41	.945
		S	19	7.32	3.092			
	Control	US	24	7.33	2.371	1.225	41	.228
		S	19	6.47	2.170			
	BDI-II	US	24	19.88	9.071	-.780	41	.440
		S	19	22.58	13.611			

MH=Mental Health

Table 18 (continued). Hypothesis C4: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Pain from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP (cont.)	BAI	US	24	15.75	11.276	-.758	41	.453
		S	19	18.37	11.206			
	Perceived Health	US	24	23.71	5.722	1.071	41	.291
		S	19	22.00	4.435			
	Walk	US	24	14.29	4.903	.127	41	.899
		S	19	14.11	4.593			
	Stand	US	24	13.04	4.486	-.793	41	.432
		S	19	14.05	3.674			

Table 18 (continued). Hypothesis C4: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Pain from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT	Age	US	103	53.02	13.490	-.894	200	.372
		S	99	54.72	13.488			
	Chronicity	US	101	96.91	99.892	-.137	197	.891
		S	98	98.99	113.94			
	Physician Visits	US	101	9.31	7.952	1.555	197	.122
		S	98	7.71	6.386			
	ER	US	101	.61	1.149	.729	198	.467
		S	99	.51	.952			
	MH Visits	US	103	3.65	8.385	.414	200	.679
		S	99	3.18	7.654			
	Treatment Procedures	US	102	2.17	2.135	1.193	198	.234
		S	98	1.81	2.138			
	Diagnostic Procedures	US	102	2.16	2.900	.334	199	.739
		S	99	2.04	1.937			
	Surgeries	US	102	.82	2.275	1.850	123.402	.067
		S	99	.38	.752			
	Hours Resting	US	102	3.80	2.692	-.503	199	.616
		S	99	3.99	2.545			
	Pain	US	103	7.51	2.604	-1.789	200	.075
		S	99	8.14	2.365			
	Interference	US	103	8.40	3.011	-1.614	196.819	.108
		S	99	9.03	2.545			
	Distress	US	103	5.96	3.366	-.772	200	.441
		S	99	6.32	3.301			
	Control	US	103	7.63	2.586	.097	200	.923
		S	99	7.60	2.555			
	BDI-II	US	103	16.97	9.433	.616	200	.539
		S	99	16.15	9.478			

MH=Mental Health

Table 18 (continued). Hypothesis C4: T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Decrease in Pain from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT (cont.)	BAI	US	103	12.65	9.365	-.700	200	.485
		S	99	13.61	10.036			
	Perceived Health	US	103	28.16	7.218	-.077	200	.939
		S	99	28.23	7.033			
	Walk	US	55	17.89	5.439	1.948	100	.054
		S	47	15.81	5.311			
	Stand	US	55	17.87	8.501	1.218	100	.226
		S	47	15.98	6.955			

Table 19. Hypothesis C4: Predictors of Success as Defined by a Decrease of At Least 20% in Pain from Pre- to Post-Treatment

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp (B)	95% C.I. for EXP(B)	
								Lower	Upper
All (with pain)	WC	-2.166	1.136	3.634	1	.057	.115	.012	1.063
	Commercial	-1.738	1.115	2.427	1	.119	.176	.020	1.566
	Medicare	-1.325	1.098	1.457	1	.227	.266	.031	2.285
	Other Ins	-1.155	1.105	1.094	1	.296	.315	.036	2.744
	Chronicity	-.002	.001	5.607	1	.018	.998	.997	1.000
	Physician Visits	-.032	.010	10.799	1	.001	.969	.951	.987
	Surgeries	-.247	.069	12.900	1	.001	.781	.683	.894
	Pain	.212	.041	26.969	1	.001	1.237	1.141	1.340
	Constant	.124	1.154	.061	1	.805	1.33		
All (no pain)	Physician Visits	-.030	.009	10.216	1	.001	.971	.953	.989
	Surgeries	-.214	.064	11.035	1	.001	.808	.712	.916
	Interference	.083	.033	6.279	1	.012	1.09	1.018	1.160
	Constant	-.318	.344	.858	1	.354	.727		
COP (with pain)	WC	-2.188	1.143	3.668	1	.055	.112	.012	1.052
	Commercial	-1.787	1.122	2.536	1	.111	.168	.019	1.510
	Medicare	-1.216	1.106	1.209	1	.272	.297	.034	2.590
	Other Ins.	-.944	1.117	.715	1	.398	.389	.044	3.472
	Chronicity	-.002	.001	4.731	1	.030	.998	.996	1.000
	Physician Visits	-.029	.011	6.232	1	.013	.972	.950	.994
	Surgeries	-.246	.080	9.446	1	.002	.782	.669	.915
	Pain	2.72	.060	20.437	1	.001	1.31	1.166	1.476
	Constant	-.261	1.232	.045	1	.832	.770		
COP (no pain)	WC	-2.222	1.130	3.865	1	.049	.108	.012	.993
	Commercial	-1.887	1.110	2.889	1	.089	.152	.017	1.335
	Medicare	-1.367	1.094	1.560	1	.212	.255	.030	2.177
	Other Ins.	-1.185	1.104	1.152	1	.283	.306	.035	2.662
	Chronicity	-.003	.001	6.420	1	.011	.997	.996	.999
	Physician Visits	-.026	.011	5.672	1	.017	.974	.953	.995
	Surgeries	-.199	.075	6.993	1	.008	.819	.707	.950
	Constant	2.275	1.092	4.344	1	.037	9.73		

Table 19 (continued). Hypothesis C4: Predictors of Success as Defined by a Decrease of At Least 20% in Pain from Pre- to Post-Treatment

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp (B)	95% C.I. for EXP(B)	
								Lower	Upper
MCOP (with pain)	†								
MCOP (no pain)	†								
FIT (with pain)	†								
FIT (no pain)	†								

† All variables excluded from the statistical model.

Table 20. Hypothesis C5: T-Tests comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL	Age	US	320	51.56	12.991	1.265	757	.206
		S	439	50.40	12.061			
	Chronicity	US	295	90.79	105.029	-.381	717	.703
		S	424	93.94	111.862			
	Physician Visits	US	307	10.21	10.075	.629	714	.530
		S	409	9.78	8.408			
	ER	US	307	.90	1.653	-1.064	727	.288
		S	422	1.04	1.801			
	Mental Health	US	310	3.08	6.758	-1.253	725	.211
		S	417	3.76	7.423			
	Treatment Procedures	US	315	1.93	2.095	-.668	749	.505
		S	436	2.04	2.433			
	Diagnostic Procedures	US	313	2.29	2.122	-.125	744	.900
		S	433	2.31	2.362			
	Surgeries	US	315	.73	1.861	-.043	745	.966
		S	432	.74	1.870			
	Hours Resting	US	318	5.04	3.073	-2.098	755	.036
		S	439	5.50	2.936			
	Pain	US	321	8.24	2.184	-3.429	762	.001
		S	443	8.76	2.003			
	Interference	US	321	9.46	2.662	-4.294	590.740	<.001
		S	443	10.23	2.117			
	Distress	US	321	6.49	3.250	-5.388	641.693	<.001
		S	443	7.72	2.903			
	Control	US	321	8.47	2.083	21.168	762	<.001
		S	443	5.36	1.949			
	BDI-II	US	321	18.41	10.269	-5.643	761	<.001
		S	442	22.65	10.222			

Table 20 (continued). Hypothesis C5: T-Tests comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
ALL (cont.)	BAI	US	320	14.44	9.839	-4.599	760	<.001
		S	442	17.86	10.361			
	Perceived Health	US	321	26.02	6.449	4.616	758	<.001
		S	439	23.98	5.669			
	Walk	US	260	15.72	5.778	1.332	658	.183
		S	400	15.12	5.541			
	Stand	US	260	14.90	6.713	.720	659	.472
		S	401	14.50	6.924			

Table 20 (continued). Hypothesis C5: T-Tests comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP	Age	US	186	50.26	12.190	.684	511	.494
		S	327	49.52	11.704			
	Chronicity	US	164	83.04	103.188	-.782	474	.434
		S	312	91.36	113.921			
	Physician Visits	US	176	11.08	11.493	1.049	289.455	.295
		S	299	10.03	8.547			
	ER Visits	US	175	1.13	1.944	-.181	483	.857
		S	310	1.16	1.865			
	Mental Health	US	177	3.09	6.350	-.899	480	.369
		S	305	3.67	7.003			
	Treatment Procedures	US	183	2.02	2.227	-.010	505	.992
		S	324	2.02	2.487			
	Diagnostic Procedures	US	180	2.42	2.286	.179	499	.858
		S	321	2.38	2.144			
	Surgeries	US	182	.90	2.161	.723	501	.470
		S	321	.76	1.861			
	Hours Resting	US	184	5.85	3.167	-.596	510	.551
		S	328	6.01	2.890			
	Pain	US	187	8.61	1.745	-1.972	516	.049
		S	331	8.95	1.905			
	Interference	US	187	10.11	2.151	-2.316	516	.021
		S	331	10.54	1.923			
	Distress	US	187	7.07	3.026	-3.147	516	.002
		S	331	7.92	2.875			
	Control	US	187	8.14	2.090	16.260	516	<.001
		S	331	5.21	1.899			
	BDI-II	US	187	20.37	10.369	-3.679	515	<.001
		S	330	23.79	10.043			

MH=Mental Health

Table 20 (continued). Hypothesis C5: T-Tests comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP (cont.)	BAI	US	186	15.75	9.798	-3.281	514	.001
		S	330	18.78	10.217			
	Perceived Health	US	187	24.59	5.731	2.920	331.355	.004
		S	327	23.15	4.745			
	Walk	US	186	15.59	5.900	1.365	513	.173
		S	329	14.88	5.571			
	Stand	US	186	14.46	6.873	.417	514	.677
		S	330	14.20	6.640			

Table 20 (continued). Hypothesis C5: T-Tests comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP (cont.)	Interference	US	187	10.11	2.151	-2.316	516	.021
		S	331	10.54	1.923			
	Distress	US	187	7.07	3.026	-3.147	516	.002
		S	331	7.92	2.875			
	Control	US	187	8.14	2.090	16.260	516	<.001
		S	331	5.21	1.899			
	BDI-II	US	187	20.37	10.369	-3.679	515	<.001
		S	330	23.79	10.043			
	BAI	US	186	15.75	9.798	-3.281	514	.001
		S	330	18.78	10.217			
	Perceived Health	US	187	24.59	5.731	2.920	331.355	.004
		S	327	23.15	4.745			
	Walk	US	186	15.59	5.900	1.365	513	.173
		S	329	14.88	5.571			
	Stand	US	186	14.46	6.873	.417	514	.677
		S	330	14.20	6.640			

Table 20 (continued). Hypothesis C5: T-Tests comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP	Age	US	18	51.61	11.647	.856	41	.397
		S	25	48.36	12.731			
	Chronicity	US	18	146.94	125.349	1.617	27.530	.117
		S	25	92.12	83.187			
	Physician Visits	US	18	13.17	13.245	.696	22.446	.494
		S	23	10.83	5.997			
	ER Visits	US	18	.67	1.188	-1.148	35.220	.259
		S	25	1.36	2.675			
	MH Visits	US	17	4.47	9.220	.381	40	.706
		S	25	3.60	5.620			
	Treatment Procedures	US	18	1.83	1.886	.268	41	.790
		S	25	1.68	1.819			
	Diagnostic Procedures	US	18	2.56	2.202	.876	41	.386
		S	25	2.00	1.936			
	Surgeries	US	18	.56	1.294	.697	40	.490
		S	24	.33	.761			
	Hours Resting	US	18	4.72	1.965	1.003	41	.322
		S	25	4.04	2.354			
	Pain	US	18	8.94	1.434	.921	41	.363
		S	25	8.52	1.531			
	Interference	US	18	10.39	2.090	.858	41	.396
		S	25	9.80	2.309			
	Distress	US	18	7.11	2.632	-.479	41	.634
		S	25	7.52	2.845			
	Control	US	18	8.39	1.944	4.067	41	<.001
		S	25	5.92	1.977			
	BDI-II	US	18	20.56	8.638	-.252	41	.803
		S	25	21.44	12.955			

MH=Mental Health

Table 20 (continued). Hypothesis C5: T-Tests comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
MCOP (cont.)	BAI	US	18	20.56	8.638	-.252	41	.803
		S	25	21.44	12.955			
	Perceived Health	US	18	23.11	4.337	.167	41	.869
		S	25	22.84	5.836			
	Walk	US	18	13.83	4.694	-.440	41	.663
		S	25	14.48	4.806			
	Stand	US	18	13.39	4.996	-.132	41	.895
		S	25	13.56	3.489			

Table 20 (continued). Hypothesis C5: T-Tests comparing "Successful" (S) and
"Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in
Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT	Age	US	116	53.63	14.214	-.355	201	.723
		S	87	54.31	12.518			
	Chronicity	US	113	93.10	102.349	-.698	198	.486
		S	87	103.71	112.084			
	Physician Visits	US	113	8.40	6.196	-.226	198	.821
		S	87	8.63	8.439			
	ER Visits	US	114	.59	1.087	.469	199	.639
		S	87	.52	1.010			
	MH Visits	US	116	2.87	6.989	-1.097	201	.274
		S	87	4.11	9.176			
	Treatment Procedures	US	114	1.81	1.909	-1.391	161.215	.166
		S	87	2.24	2.387			
	Diagnostic Procedures	US	115	2.05	1.815	-.277	200	.782
		S	87	2.15	3.131			
	Surgeries	US	115	.50	1.334	-1.035	200	.302
		S	87	.75	2.109			
	Hours Resting	US	116	3.81	2.631	-.478	200	.633
		S	86	3.99	2.601			
	Pain	US	116	7.53	2.688	-1.663	201	.098
		S	87	8.13	2.342			
	Interference	US	116	8.28	3.058	-2.418	200.334	.017
		S	87	9.21	2.426			
	Distress	US	116	5.46	3.445	-3.406	201	.001
		S	87	7.02	2.949			
	Control	US	116	9.03	1.989	11.341	201	<.001
		S	87	5.78	2.054			
	BDI-II	US	116	14.92	9.448	-2.846	201	.005
		S	87	18.67	9.037			

MH=Mental Health

Table 20 (continued). Hypothesis C5: T-Tests comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as At Least a 20% Increase in Control from Pre- to Post-Treatment

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT (cont.)	BAI	US	116	12.29	9.921	-1.382	201	.168
		S	87	14.18	9.262			
	Perceived Health	US	116	28.78	6.894	1.322	201	.188
		S	87	27.45	7.326			
	Walk	US	56	16.73	5.574	-.405	100	.686
		S	46	17.17	5.355			
	Stand	US	56	16.84	6.353	-.227	100	.821
		S	46	17.20	9.422			

Table 21. Hypothesis C5: Predictors of Success as Defined by an Increase of At Least 20% in Control from Pre- to Post-Treatment

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
All (with control)	Control	-.738	.054	189.942	1	.001	.478	.431	.531
	Constant	5.424	.388	195.14	1	.001	226.74		
All (no control)	Distress	.108	.025	18.111	1	.001	1.114	1.084	1.193
	PH	-.042	.013	10.281	1	.001	.959	1.060	1.170
	Constant	.569	.415	2.061	1	.151	1.815		
COP (with control)	Control	-.723	.066	120.88	1	.001	.485	.427	.552
	Constant	5.389	.466	133.61	1	.001	218.97		
COP (no control)	Distress	.083	.032	6.871	1	.009	1.087	1.021	1.157
	PH	-.046	.018	6.530	1	.011	.955	.921	.989
	Constant	1.041	.532	3.833	1	.050	2.832		
MCOP (with control)	Control	-.634	.207	9.349	1	.002	.530	.353	.796
	Constant	4.835	1.533	9.949	1	.002	125.80		
MCOP (no Control)	†								
FIT (with control)	Control	-.759	.107	50.630	1	.001	.468	.380	.577
	Constant	5.379	.811	43.973	1	.001	216.76		
FIT (no control)	Distress	.148	.045	10.651	1	.001	1.160	1.061	1.268
	Constant	-1.215	.324	14.039	1	.001	.297		

† All variables excluded from the statistical model.

Table 22. T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants,
With Success Defined as Meeting Criteria in At Least Three of the Five Domains (e.g.,
Decreased Pain, Increased Control)

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
All	Age	US	645	50.99	12.67	.533	749	.594
		S	106	50.29	11.25			
	Chronicity	US	608	92.41	110.24	-.049	708	.961
		S	102	92.99	109.42			
	Physician Visits	US	598	9.78	9.40	.378	702	.705
		S	106	9.42	6.76			
	ER Visits	US	613	0.93	1.63	-1.186	127.591	.238
		S	105	1.18	2.05			
	Diagnostic Procedures	US	628	2.26	2.29	-.964	733	.336
		S	107	2.49	2.08			
	Surgeries	US	631	0.77	1.96	.719	736	.472
		S	107	0.63	1.20			
	Hours Resting	US	638	5.23	3.04	-2.645	742	.008
		S	106	6.07	2.88			
	Pain	US	645	8.48	2.17	-3.235	169.954	.001
		S	107	9.07	1.69			
	Interference	US	645	9.75	2.50	-4.497	187.699	<.001
		S	107	10.63	1.73			
	Distress	US	645	7.09	3.19	-2.710	156.166	.007
		S	107	7.89	2.78			
	Control	US	643	6.86	2.62	7.680	185.876	<.001
		S	107	5.27	1.85			
	BDI-II	US	645	20.34	10.66	-3.821	165.194	<.001
		S	107	23.90	8.60			
	BAI	US	644	16.00	10.17	-3.036	749	.002
		S	107	19.24	10.49			
	Perceived health	US	641	25.20	6.31	3.296	177.536	.001
		S	107	23.50	4.68			
	Walk	US	533	15.46	5.86	.196	174.174	.845
		S	107	15.36	4.85			
	Stand	US	534	14.80	7.13	.218	639	.828
		S	107	14.64	5.96			

Table 22 (continued). T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Meeting Criteria in At Least Three of the Five Domains (e.g., Decreased Pain, Increased Control)

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP	Age	US	433	49.67	12.02	-.500	530	.618
		S	99	50.33	11.50			
	Chronicity	US	399	87.48	110.22	-.436	492	.663
		S	95	92.98	111.29			
	Physician Visits	US	388	10.42	10.32	.705	485	.481
		S	99	9.65	6.83			
	ER Visits	US	402	1.11	1.82	-.543	498	.587
		S	98	1.22	2.09			
	Diagnostic Procedures	US	416	2.33	2.20	-.856	514	.393
		S	100	2.54	2.11			
	Surgeries	US	419	0.85	2.09	.908	517	.364
		S	100	0.65	1.23			
	Hours Resting	US	427	5.89	3.01	-.906	524	.365
		S	99	6.19	2.90			
	Pain	US	432	8.81	1.90	-1.417	530	.157
		S	100	9.10	1.65			
	Interference	US	432	10.30	2.13	-1.537	174.504	.126
		S	100	10.61	1.75			
	Distress	US	432	7.58	3.03	-.765	530	.445
		S	100	7.83	2.81			
	Control	US	430	6.45	2.60	4.960	203.392	<.001
		S	100	5.35	1.83			
	BDI-II	US	432	22.25	10.74	-1.679	174.633	.095
		S	100	23.96	8.78			
	BAI	US	431	17.51	10.32	-1.171	529	.242
		S	100	18.85	10.12			
	Perceived Health	US	428	23.76	5.35	.770	526	.442
		S	100	23.31	4.67			
	Walk	US	433	15.18	5.89	.242	174.177	.809
		S	100	15.04	4.83			
	Stand	US	434	14.34	6.94	.184	532	.854
		S	100	14.20	5.45			

Table 22 (continued). T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Meeting Criteria in At Least Three of the Five Domains (e.g., Decreased Pain, Increased Control)

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT	Age	US	212	53.68	13.54	.770	217	.442
		S	7	49.71	7.61			
	Chronicity	US	209	101.82	109.94	.206	214	.837
		S	7	93.14	86.73			
	Physician Visits	US	210	8.59	7.27	.883	215	.378
		S	7	6.14	4.85			
	ER Visits	US	211	0.59	1.10	.050	216	.961
		S	7	0.57	1.13			
	Diagnostic Procedures	US	212	2.11	2.46	.426	217	.670
		S	7	1.71	1.25			
	Surgeries	US	212	0.61	1.69	.504	217	.615
		S	7	0.29	0.49			
	Hours Resting	US	211	3.89	2.64	-.390	216	.697
		S	7	4.29	2.14			
	Pain	US	213	7.81	2.52	-.939	218	.349
		S	7	8.71	2.29			
	Interference	US	213	8.64	2.80	-2.078	218	.039
		S	7	10.86	1.68			
	Distress	US	213	6.09	3.27	-2.105	218	.036
		S	7	8.71	2.14			
	Control	US	213	7.68	2.49	3.713	218	<.001
		S	7	4.14	1.86			
	BDI-II	US	213	16.46	9.39	-1.827	218	.069
		S	7	23.00	5.74			
	BAI	US	213	12.95	9.14	-2.142	6.155	.075
		S	7	24.86	14.61			
	Perceived Health	US	213	28.09	7.07	.723	218	.470
		S	7	26.14	4.14			
	Walk	US	100	16.69	5.60	-1.481	105	.142
		S	7	19.86	2.61			
	Stand	US	100	16.79	7.63	-1.343	105	.182
		S	7	20.86	9.42			

Table 23. Predictors of Success as Defined by Meeting Criteria for Success in At Least
Three of the Five Domains (e.g., Decreased Pain, Increased Control)

Treatment Program	Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
All	Surgeries	-.085	.042	4.130	1	.042	.918	.845	.997
	Control	-.209	.032	42.031	1	.001	.812	.762	.864
	Constant	2.063	.243	71.930	1	.001	7.869		
COP	WC	-1.30	1.129	1.334	1	.248	.271	.030	2.481
	Commercial	-.635	1.116	.324	1	.569	.530	.059	4.723
	Medicare	-.387	1.099	.124	1	.725	.679	.079	5.850
	Other	-.089	1.014	.006	1	.936	.915	.103	8.112
	Surgeries	-.162	.056	8.407	1	.004	.850	.762	.949
	Control	-.176	.044	15.949	1	.000	.838	.769	.914
	Perceived Health	-.049	.020	6.097	1	.014	.952	.915	.990
	Constant	3.889	1.185	10.821	1	.001	49.376		
FIT	Control	-.146	.055	6.992	1	.008	.864	.775	.963
	Constant	.880	.436	4.074	1	.044	2.412		

Table 24. T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Meeting Criteria for Success in All Five of the Domains (e.g., Decreased Pain, Increased Control)

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
All	Age	US	645	50.99	12.67	.533	749	.594
		S	106	50.29	11.25			
	Chronicity	US	608	92.41	110.24	-.049	708	.961
		S	102	92.99	109.42			
	Physician Visits	US	598	9.78	9.40	.378	702	.705
		S	106	9.42	6.76			
	ER visits	US	613	0.93	1.63	-1.186	127.591	.238
		S	105	1.18	2.05			
	Diagnostic Procedures	US	628	2.26	2.29	-.964	733	.336
		S	107	2.49	2.08			
	Surgeries	US	631	0.77	1.96	.719	736	.472
		S	107	0.63	1.20			
	Hours Resting	US	638	5.23	3.04	-2.645	742	.008
		S	106	6.07	2.88			
	Pain	US	645	8.48	2.17	-3.235	169.954	.001
		S	107	9.07	1.69			
	Interference	US	645	9.75	2.50	-4.497	187.699	<.001
		S	107	10.63	1.73			
	Distress	US	645	7.09	3.19	-2.710	156.166	.007
		S	107	7.89	2.78			
	Control	US	643	6.86	2.62	7.680	185.876	.000
		S	107	5.27	1.85			
	BDI-II	US	645	20.34	10.66	-3.821	165.194	<.001
		S	107	23.90	8.60			
	BAI	US	644	16.00	10.17	-3.036	749	.002
		S	107	19.24	10.49			
	Perceived health	US	641	25.20	6.31	3.296	177.536	.001
		S	107	23.50	4.68			
	Walk	US	533	15.46	5.86	.196	174.174	.845
		S	107	15.36	4.85			
	Stand	US	534	14.80	7.13	.218	639	.828
		S	107	14.64	5.96			

Table 24 (continued). T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Meeting Criteria for Success in All Five of the Domains (e.g., Decreased Pain, Increased Control)

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
COP	Age	US	433	49.67	12.02	-.500	530	.618
		S	99	50.33	11.50			
	Chronicity	US	399	87.48	110.22	-.436	492	.663
		S	95	92.98	111.29			
	Physician Visits	US	388	10.42	10.32	.705	485	.481
		S	99	9.65	6.83			
	ER Visits	US	402	1.11	1.82	-.543	498	.587
		S	98	1.22	2.09			
	Diagnostic Procedures	US	416	2.33	2.20	-.856	514	.393
		S	100	2.54	2.11			
	Surgeries	US	419	0.85	2.09	.908	517	.364
		S	100	0.65	1.23			
	Hours Resting	US	427	5.89	3.01	-.906	524	.365
		S	99	6.19	2.90			
	Pain	US	432	8.81	1.90	-1.417	530	.157
		S	100	9.10	1.65			
	Interference	US	432	10.30	2.13	-1.537	174.504	.126
		S	100	10.61	1.75			
	Distress	US	432	7.58	3.03	-.765	530	.445
		S	100	7.83	2.81			
	Control	US	430	6.45	2.60	4.960	203.392	<.001
		S	100	5.35	1.83			
	BDI-II	US	432	22.25	10.74	-1.679	174.633	.095
		S	100	23.96	8.78			
	BAI	US	431	17.51	10.32	-1.171	529	.242
		S	100	18.85	10.12			
	Perceived Health	US	428	23.76	5.35	.770	526	.442
		S	100	23.31	4.67			
	Walk	US	433	15.18	5.89	.242	174.177	.809
		S	100	15.04	4.83			
	Stand	US	434	14.34	6.94	.184	532	.854
		S	100	14.20	5.45			

Table 24 (continued). T-Tests Comparing "Successful" (S) and "Unsuccessful" (US) Participants, With Success Defined as Meeting Criteria for Success in All Five of the Domains (e.g., Decreased Pain, Increased Control)

Prog.	Variable	Status	N	Mean	SD	t	df	Sig.
FIT	Age	US	212	53.68	13.54	.770	217	.442
		S	7	49.71	7.61			
	Chronicity	US	209	101.82	109.94	.206	214	.837
		S	7	93.14	86.73			
	Physician Visits	US	210	8.59	7.27	.883	215	.378
		S	7	6.14	4.85			
	ER Visits	US	211	0.59	1.10	.050	216	.961
		S	7	0.57	1.13			
	Diag. Procedures	US	212	2.11	2.46	.426	217	.670
		S	7	1.71	1.25			
	Surgeries	US	212	0.61	1.69	.504	217	.615
		S	7	0.29	0.49			
	Hours Resting	US	211	3.89	2.64	-.390	216	.697
		S	7	4.29	2.14			
	Pain	US	213	7.81	2.52	-.939	218	.349
		S	7	8.71	2.29			
	Interference	US	213	8.64	2.80	-2.078	218	.039
		S	7	10.86	1.68			
	Distress	US	213	6.09	3.27	-2.105	218	.036
		S	7	8.71	2.14			
	Control	US	213	7.68	2.49	3.713	218	<.001
		S	7	4.14	1.86			
	BDI-II	US	213	16.46	9.39	-1.827	218	.069
		S	7	23.00	5.74			
	BAI	US	213	12.95	9.14	-2.142	6.155	.075
		S	7	24.86	14.61			
	Perceived Health	US	213	28.09	7.07	.723	218	.470
		S	7	26.14	4.14			
	Walk	US	100	16.69	5.60	-1.481	105	.142
		S	7	19.86	2.61			
	Stand	US	100	16.79	7.63	-1.343	105	.182
		S	7	20.86	9.42			

Table 25. Predictors of Success with Success Defined as Meeting Criteria for Success in All Five Domains (e.g., Decreased Pain, Increased Control)

Prog.	Variable	β	SE	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
All	WC	-1.690	1.301	1.686	1	.194	.185	.014	2.365
	Commercial	.233	1.118	.044	1	.835	1.263	.141	11.290
	Medicare	.424	1.085	.153	1	.696	1.528	.182	12.821
	Other	.512	1.096	.219	1	.640	1.669	.195	14.295
	Interference	.155	.057	7.429	1	.006	1.168	1.044	1.305
	Control	-.262	.047	31.685	1	.000	.769	.702	.843
	Constant	-2.116	1.284	2.715	1	.099	.120		
COP	WC	-1.561	1.299	1.444	1	.229	.210	.016	2.678
	Commercial	.251	1.118	.050	1	.823	1.285	.144	11.505
	Medicare	.673	1.087	.383	1	.536	1.960	.233	16.511
	Other	.856	1.099	.608	1	.436	2.355	.273	20.288
	Control	-.212	.049	18.744	1	<.001	.809	.735	.890
	Constant	-.715	1.111	.415	1	.520	.489		
FIT	Interference	.632	.308	4.200	1	.040	1.881	1.028	3.443
	Control	-1.124	.399	7.920	1	.005	.325	.149	.711
	Walk	.286	.123	5.455	1	.020	1.332	1.047	1.693
	Constant	-8.243	3.908	4.448	1	.035	.000		

Table 26. Rates of Success in COP and FIT, With Success Defined as the Number of Domains (e.g., Decrease in Pain, Increase in Control, etc.) in Which Success was Achieved

Number of Successes	COP	FIT	Sig.
1+	98.3% (N=528)	89.1% (N=196)	<.001
2+	87.0% (N=467)	68.2% (N=50)	<.001
3+	71.3% (N=383)	44.5% (N=98)	<.001
4+	47.5% (N=255)	17.3% (N=38)	<.001
5	18.6% (N=100)	3.2% (N=7)	<.001

Table 27. Rates of Success in COP and FIT across Increasingly Greater Number of Hours Resting at Pre-Treatment

Hours Resting Score	COP	FIT	Sig.
4+	72.3% (N=298)	42.9% (N=48)	<.001
5+	70.4% (N=231)	43.4% (N=36)	<.001
6+	70.8% (N=204)	42.4% (N=28)	<.001
7+	71.8% (N=153)	29.0% (N=9)	<.001
8+	70.9% (N=134)	26.9% (N=7)	<.001

Table 28. Rates of Success in COP and FIT across Increasingly Higher Pre-Treatment Pain Scores

Pain Scores	COP	FIT	Sig.
5-	72.8% (N=17)	63.2% (N=24)	.534
6+	72.0% (N=366)	40.7% (N=74)	<.001
7+	72.7% (N=341)	41.3% (N=66)	<.001
8+	73.7% (N=311)	44.3% (N=58)	<.001
9+	73.2% (N=240)	43.8% (N=39)	<.001
10+	71.8% (N=150)	42.9% (N=27)	<.001
11+	71.3% (N=67)	44.4% (N=16)	.004

Table 29. Rates of Success in COP and FIT for the Overall Sample and Samples Based on Pre-Treatment Resting and Pain Cut-Scores Using Reformulated Definitions of Successful Improvement in the Five Domains, With Success Defined as Meeting Criteria in Three of the Five Domains

Sample	COP	FIT	Sig.
All	81.0% (N=435)	62.7% (N=138)	<.001
Hours Resting 7+	80.3% (N=341)	41.9% (N=66)	<.001
Pain 6+	79.5% (N=412)	20.5% (N=106)	<.001

APPENDIX C
Psychosocial Measures

Welcome to the Comprehensive Outpatient Program. We are delighted to have you join us in starting this rehabilitation program. To help us help you better we ask that you fill out the following questionnaires. You probably filled these out when during the evaluation prior to initiating treatment, but we want to make sure that we have updated information.

General Information Sheet

Today's Date: _____

Name: _____
      Last   First   Middle Initial

Sex: __ Male   ___ Female   Age: ____   Date of Birth: _____

When did your pain start? _____

Current Address:

_____
        No.   Street

_____
    City   State   Zip

Home Phone: _____   Cell Phone: _____
  (area code) (number)   (area code) (number)
Beeper: _____   Home Phone: _____
  (area code) (number)   (area code) (number)

Phone numbers of 4 people to contact in an emergency or for follow up. Please list in order the person we should try to reach first. This list can include spouses, significant other, parents, grandparents, adult children, or even close friends.

Name: _____

Relationship: _____   **Phone:** _____
                         (area code) (number)

Name: _____

Relationship: _____   **Phone:** _____
                         (area code) (number)

Daily Life Questionnaire – Admission
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Name: _____

Relationship: _____   **Phone:** _____
                                                        (area code) (number)

Name: _____

Relationship: _____   **Phone:** _____
                                                        (area code) (number)

PLEASE ANSWER THESE QUESTIONS ABOUT YOUR GENERAL HEALTH.
    1. In general, would you say your health is?

1. __ Excellent   2. __Very good   3. __Good   4. __ Fair   5. __ Poor

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, rate each one using the following scale.
    2. <u>Moderate activities</u>: such as moving a table, pushing a vacuum cleaner, or playing golf.

1. ___ Yes, limited a lot   2. ___ Yes, limited a little   3. ___ No, not at all

    3. Climbing <u>several</u> flights of stairs

1. ___ Yes, limited a lot   2. ___ Yes, limited a little   3. ___ No, not at all

During the <u>past 4 weeks</u> have you had any one of the following problems with your work or other regular daily activities <u>as a result of your physical health?</u>
    4. Accomplished less that you would like?   1. __ Yes 2.__ No

    5. Were limited in the kind of work or other activities?   1. __ Yes 2.__ No

Overall during the <u>past 4 weeks</u> have you had any of the following problems with your work or other regularly daily activities <u>as a result of any emotional problems</u> (such as feeling anxious or tense?)
    6. Accomplished less than you would like?   1. __ Yes 2. __ No

    7. Did not do work as carefully as usual?   1. __ Yes 2. __ No

    8. Overall, during the <u>past 4 weeks</u> how much did pain interfere with your normal work (including both inside and outside the home and housework):

1. _ Not at all   2. _ A little bit 3. _ Moderately 4. _ Quite a bit 5. _ Extremely

Daily Life Questionnaire – Admission
Revised 7/14/09

Now please rate how things have been <u>past 4 weeks</u>. For each question please give the one answer that comes closest to the way you have been feeling.

How much of the time during the <u>past 4 weeks</u>

(1)All	(2) Most	(3) A good bit	(4) A little	(5)None of the time

9. Have you felt calm and peaceful?

___   ___   ___   ___   ___

10. Did you have a lot of energy?

___   ___   ___   ___   ___

11. Have you felt downhearted and blue?

___   ___   ___   ___   ___

12. During the past 4 weeks, how much of the time has your <u>physical or emotional problems</u> interfered with your social activities (e.g., visiting with friends, relatives, etc).

___   ___   ___   ___   ___

13. What prescription medications do you currently take:

_____   _____

_____   _____

_____   _____

_____   _____

14. Are you getting all your pain medication from one physician? (e.g., Lortab, Lorcet, Ultram, does not include anti-inflammatory medication)
    ___Yes   ___ No   ___ Not taking any pain medicine

15. Do you take more pain medication than prescribed by your physician? (e.g., Lortab, Lorcet, Ultram, does not include anti-inflammatory medication)
    ___Yes   ___ No   ___ Not taking any pain medicine

Daily Life Questionnaire – Admission
Revised 7/14/09

In the last 12 months how many times have you gone to the following medical professionals <u>for your pain problem</u>? Circle the closest answer. If you can't recall, just put down your best guess.

16. Seen a physician or dentist for an office visit?
    0 1 2 3 4 5 6 7 8 9 10   *Please record how many if more than 10 (_____)*

17. Seen a chiropractor?
    0 1 2 3 4 5 6 7 8 9 10   *Please record how many if more than 10 (_____)*

18. Been to the emergency room because of bad pain?
    0 1 2 3 4 5 6 7 8 9 10   *Please record how many if more than 10 (_____)*

19. Met with a mental health professional? (psychiatrist, counselor, psychologist)
    0 1 2 3 4 5 6 7 8 9 10   *Please record how many if more than 10 (_____)*

In the last 12 months how many:

20. <u>Pain management procedures</u> have you had (e.g. trigger point injections, sympathetic nerve blocks, epidural steroid injections, facet blocks)
    0 1 2 3 4 5 6 7 8 9 10   *Please record how many if more than 10 (_____)*

21. <u>Diagnostic tests</u> have you had for your pain (e.g., MRI, CT scan, myelogram, EMG nerve conduction study)?
    0 1 2 3 4 5 6 7 8 9 10   *Please record how many if more than 10 (_____)*

22. <u>Surgeries</u> have you had for your pain (e.g., spine surgery such as laminectomy or fusion, carpal tunnel release, sympathectomy)?
    0 1 2 3 4 5 6 7 8 9 10   *Please record how many if more than 10 (_____)*

23. Have you had implantation of a <u>morphine pump</u>?   Yes ___ No____

24. Have you had implantation of a spinal cord stimulator? Yes ___ No____

Daily Life Questionnaire – Admission
Revised 7/14/09

25. What is your current work status? (Please check one that best fits)
  __ 1. Working full time, regular duties
  __ 2. Working full time, light duty or different duties
  __ 3. Modified work (4-7 hours a day)
  __ 4. Part time (less than 4 hours a day)
  __ 5. Have a job but have not been released to work
  ___ 6. Not employed but have activities which help make some money
  __ 7. Not working outside the home and do not have a job
  __ 8. In vocational retraining or working with the Texas Rehabilitation Commission

26. If you are not working full time, is this because of your pain problem?
  ___ Yes   ___ No

27. Please check the following types of disability payments you receive due to your pain problem:
  ___ 1. Workers Compensation
  ___ 2. Social Security Disability
  ___ 3. Private Disability

28. If you were injured on the job and received Workers Compensation, have you been placed at Maximal Medical Improvement and given an impairment rating? ____ Yes   ____ No

29. Do you have a plan to self manage your pain?   ____ Yes   ____ No

In the last 7 days on how many days did you do the following to manage your pain?
  30. Distract self by getting active in something else
   1 2 3 4 5 6 7
  31. Relaxation tapes, self hypnosis, biofeedback for at least 20 minutes
   1 2 3 4 5 6 7
  32. Stretching program (at least for 10 minutes)
   1 2 3 4 5 6 7
  33. Exercise (for at least 30 minutes, e.g., walking, back strengthening)
   1 2 3 4 5 6 7

  34. How helpful were these or other techniques (other than medicine) in managing your pain?
  Not helpful   `   **Very helpful**
   1   2   3   4   5   6   7   8   9   10

Daily Life Questionnaire – Admission
Revised 7/14/09

Name: _____   **Date:** _____

Your Pain Center Physician: Noe   Brown   Vera   Haynsworth

Please circle a number that describes how that specific question applies to you.

1. What is your level of pain at the <u>present moment</u>?

    0   1   2   3   4   5   6

    No pain   Very intense pain

2. On average, how severe has your pain been <u>in the past week</u>?

    0   1   2   3   4   5   6

    Not at all   Extremely severe

3. How much has pain changed the amount of satisfaction or enjoyment you get from taking part in social and recreational activities?

    0   1   2   3   4   5   6

    No change   Extreme change

4. How much has pain changed your ability to participate in social and recreational activities?

    0   1   2   3   4   5   6

    No change   Extreme change

5. During the past week, how tense or anxious have you been?

    0   1   2   3   4   5   6

    Not at all   Extremely tense

6. During the past week, how irritable have you been?

    0   1   2   3   4   5   6

    Not at all   Extremely irritable

7. During the past week, how well do you feel you have been able to deal with your problems?

    0   1   2   3   4   5   6

    Not at all   Extremely well

8. During the past week, how successful were you in coping with stressful situations in your life?

    0   1   2   3   4   5   6

    Not at all   Extremely successful

9. During the past week, how discouraged or hopeless have you felt?

    0   1   2   3   4   5   6

    Not at all   Very hopeless

10. During the past week, how interested have you been in other people or activities?

    0   1   2   3   4   5   6

    Very interested   Very poor interest

MPI Short Form
Revised 7/14/09

Please answer the following questions about last week (Monday through Friday).

11. On average, how many hours a day did you rest because of your pain between 8:00 AM and 8:00 PM? ____

12. On average, how many hours a day were you active or productive between 8:00 AM and 8:00 PM? ____

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