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Factor Structure and Psychometric Characteristics of the Beck Depression Inventory-Fast Screen in a Sample of Patients with Pain

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Dissertation Approval

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To my husband Chris, my children, Gianna, Ben and Calvin, and my family, I dedicate this thesis.

Abstract

The purpose of this study was to extend previous literature of the BDI-FastScreen and demonstrate a more empirical clinical utility within a sample of patients with pain. This study utilized existing data found in a large, multiphysician, multilocation pain management practice. The sample consisted of 328 male and female patients with pain. Various psychometric analyses were performed. Results pertaining to the internal consistency of the BDI-FastScreen determined the items most highly correlated were *pessimism* and *loss of pleasure*. A factor analysis revealed 49.18 % of the variance of the factor structure of the BDI-FastScreen was comprised of one factor. Gender was investigated as a moderator of depression and pain and although gender was not demonstrated to moderate the pain / depression relationship, there was a clear relationship between pain and depression. There was a significant correlation between the physicians' rated depression score and patients' corresponding, self-reported depression scores on the BDI-FastScreen. Researchers compared patients' self-rated depression scores and depression descriptors embedded within another measure. A significant correlation between the BDI-FastScreen scores and the items on a derivative of the SF-MPQ was found. All the correlations were significant, confirming the supposition that breaking down the seven items into descriptors and embedding the descriptors into a different measure adequately assesses for depression.

Results of this project demonstrate the BDI-FastScreen can be condensed to one word descriptors and adequately assess for depression in a population with chronic pain. Instead of utilizing the data from two distinct measures, the adapted patient encounter

form, a derivative of the SF-MPQ and BDI-FastScreen, both clinical disorders can be expeditiously and adequately assessed. This study will provide physicians and clinical health psychologists with diverse insights and the ability to utilize multiple depression measures to provide insightful treatments for their patients.

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Epigraph

The mind is everything; what you think, you become.
Buddha

Chapter 1

Statement of the Problem

Rates of depression are higher in populations of general medical patients when compared to individuals not seeking treatment for a general medical condition (Clark, Cook, & Snow, 1998; Freeman, Lightner & Golden, 2010). Coexisting depression symptoms can exacerbate medical symptoms and negatively affect social adjustment and future recovery. A single depressive episode can present a potential risk for future episodes of depression. Depression symptoms though, are not always easy to diagnose as depression specific. Neurovegetative and somatic symptoms in depression symptomatology may overlap with symptomatology found in other medical illnesses, thereby leaving depression difficult to identify and diagnose (Freeman et al 2010). In patients with chronic pain, for example, depression has been established as the most common comorbid condition (Poole, Bramwell, & Murphy, 2006; Tennen, Affleck, & Zautra, 2006).

In the United States, pain is one of the most prevalent reasons for seeking medical care. Gatchel and Oordt (2004) estimated that more than 50 million Americans seek medical attention for regulation of pain symptoms each year, with pain symptoms accounting for more than 80% of all physician visits. According to Turk and Burwinkle (2005), within a specified 3-month period, approximately 200 million American's report a recent episode of low back pain, migraine pain, or neck pain. With the high rate of individuals seeking control of pain and a high rate of depression comorbidity, the ease of recognition and subsequent treatment of both disorders may be subsumed.

Pain-clinic statistics report prevalence rates of depression ranging from 30-54% (Poole, et al., 2006). In the population with chronic back pain for example, depression is a common concomitant factor with a prevalence rate, that may be higher than 52% (Wesley, Gatchel, Garofalo, & Polatin, 1999). Depression has been demonstrated to complicate the prognosis for patients with chronic pain; yet, there are similarities in diagnostic criteria between depression and chronic pain (Poole, et al., 2006). Specific examples include somatic symptoms, such as sleep disturbances, and quality-of-life indicators, such as loss of interest in previously enjoyable activities. The connection between pain and depression is further exemplified in areas of other areas of somatic function and negative views of self (Tennen, et al., 2006; Zlot, Herrmann, Hofer-Mayer, Adler, & Adler, 2000). Additional research also has determined that depression influences pain and that pain can predict a depressive episode in individuals with a prior history of depression (Tennen, et al., 2006). These reciprocal influences demonstrate an established connection between depression and chronic pain.

The concomitant relationship between depression and chronic pain symptomatology has been well established (Poole, et al., 2006;Tennen, et al., 2006; Wesley, et al., 1999). For example, previous research has established the benefits of early intervention techniques to target depression (Dysvik, Natvig, Eikeland, & Lindstrom, 2005). Identifying negative health habits, such as smoking or drinking alcohol, identifying detrimental behavioral activities and distorted thinking that may accompany both depression and chronic-pain symptomatology, may facilitate a better prognosis and minimize recovery time. Therefore, an integrated measure targeting depression and

chronic pain will enhance diagnostic abilities and afford the patient the benefit of early depression detection.

Depression is related to sensory, emotional and cognitive factors of pain. Assessing for depression at the outset of treatment and throughout the course of treatment may help clinicians to detect behavioral activities, distorted thinking and negative health habits that may assist them in understanding the patient in a comprehensive manner.

Purpose of the Study

The purpose of this study is to determine the factor structure and psychometric properties of the Beck Depression Inventory-FastScreen in a sample of patients with pain. Research clearly indicates that the rates of depression are higher in general medical patients with a concomitant high comorbidity of psychological disorders than those without the existing comorbidity. The reciprocal influences of pain and depression, such as negative emotions and a decrease in activity level, serve to perpetuate aspects of both disorders. The Beck Depression Inventory-II (BDI-II) is the most prevalent measure used to identify depression. Using the BDI-II as a foundation, the BDI-FastScreen was developed to factor out neurovegetative signs of depression found in a medical population and concentrate on those factors of depression that relate soley to depression. This measure was specifically developed to factor out co-occurring depression symptomatology that may be related to a medical condition (Steer, Cavalieri, Lenonard, & Beck, 1999).

Most physicians, including family practitioners, psychiatrists and pain specialists, may fail to identify symptomatology as depression specific (Clark, Cook, & Snow, 1998). Depression within the pain population can exacerbate medical symptoms thereby

negatively affecting social adjustment and future recovery (Clark, et al., 1998). An episode of depression can increase the probability of future episodes of depression. Although the BDI is the most common measure administered to assess depression in the general medical population, the amount of research validating the psychometric properties of this measure within the pain population is limited. Therefore, this study will examine the factor structure of the BDI-FastScreen within a sample of patients with pain and evaluate how this measure relates to patient and physician appraisal, demographic information, and characteristics of the individual patient with pain, such as age, gender, diagnosis, onset, and duration.

This study will serve to provide physicians and clinical health psychologists with diverse insights into patients with pain and the ability to utilize multiple depression measures to provide meaningful treatments for their patients. The concomitant relationship between depression and pain symptomatology has been well established in previous research (Poole, et al., 2006; Tennen, et al., 2006; Wesley, et al., 1999). The benefit of early intervention techniques targeting depression symptomatology has also been established (Dysvik, et al., 2005). Identifying distorted thinking, detrimental behavioral activities and negative health habits that may accompany both depression and pain symptomatology may facilitate a better prognosis and minimize convalescence time. Therefore, an integrated patient profile targeting depression and pain will enhance diagnostic abilities and afford the patient the benefit of early depression detection. In the context of routine pain-management treatment, if physicians in a multidisciplinary pain practice can promptly and accurately detect and identify patients with a comorbid depression episode, the current pain episode potentially could be minimized.

Chapter 2

In the United States, major depression is a principal cause of disability and is estimated to occur in approximately 4% of the general population (Ohayon & Schatzberg, 2003). However, this specific estimate of depression is augmented when there is a concentrated focus on a precise aspect of the general population. Specifically, when general medical patients are examined and compared with a population of individuals not receiving treatment, for example, the medical population exhibits an increased rate of depression symptomatology (Clark, et al., 1998). Researchers have demonstrated that 4% of a sample of 20,000 individuals met the criteria for a depression diagnosis. Within the same population, it was further demonstrated that 16.5% of the total number of participants reported a minimum of one depression symptom (Ohayon & Schatzberg, 2003).

Depression Comorbidity

Depression is a psychological disorder that affects individuals across their lifespan. Depression knows no boundaries and can affect children, adolescents, adults, and elderly individuals. The symptomatology indicative of depression includes somatic complaints, physical symptoms, and feelings of sadness, loneliness, hopelessness, and agitation. Mental health problems are frequently encountered in primary-care (DiTomasso, Golden & Morris, 2010). Diagnosing depression within the primary-care setting raises its own set of difficulties. When presented to a primary-care specialist, individuals most commonly describe somatic manifestations of depression, such as pain, anhendonia, and difficulty sleeping.

When individuals with a general medical condition have a comorbid diagnosis of depression, many facets of the psychological symptomatology, may serve to impede, a recovery from the medical disorder. Specifically, psychological symptomatology can exacerbate medical symptoms thereby negatively affecting social adjustment and future recovery. Additionally, one episode of depression may elevate the risk for future episodes of depression. Neurovegetative and somatic symptoms found in depression symptomatology often overlap with symptomatology found in other medical illnesses thereby leaving depression difficult to identify and diagnose. Researchers have estimated that approximately 52 % of individuals being treated in a pain clinic will fit the diagnostic criteria for both pain and depression (Bair, Robinson, Katon, & Kroenke, 2003). This number is higher in other medical settings. Particularly within an orthopedic setting and in a dental clinic, as many as 56 % and 85 %, respectively, of patients have a comorbid pain and depression diagnosis (Bair, et al., 2003).

Consquently, individuals being treated for a pervasive medical condition are more susceptible than individuals not being treated, to simultaneously develop depression symptomatology (Clark, et al., 1998). Broadening the terms of pervasive medical conditions also to encompass a general medical population, researchers believe a higher number of general medical patients are at an increased risk for developing subclinical symptomatology (Clark, et al., 1998).

Depression and gender. Although contextually the manifestation of depression symptoms has been established, there are additional prevalent differences. For example, depression may present differently between genders. Women endorse symptomatology such as depressed mood, crying and guilt (Sloan & Sandt, 2006). Men, on the other

hand, typically report feelings of anger (Sloan & Sandt, 2006). Thus the type and manifestation of depression symptomatology have been demonstrated to be different between genders.

The prevalence of depression between genders is also different. The lifetime prevalence rates of depression are different for adult men versus women. A 1993 review of the National Comorbidity Survey revealed a lifetime prevalence rate of depression at 12 % higher for women than men (Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993). Women tend to have a higher lifetime prevalence rate, further indicating increased rates of depression. Kessler et al. (1993) have shown that women have a 17.1 % lifetime prevalence rate of a major depression disorder.

Women are diagnosed with depression at more than twice the rate that men when diagnosed with the same disorder (Culbertson, 1997; Sloan & Sandt, 2006). Specifically, it has been reported that adult females are diagnosed with depression at a rate of 22.4% when compared to adult males who are diagnosed at a rate of 13.9 % (Angst, Gamma, Gastpar, Lepine, Mendelwicz, & Tylee, 2002). Depression affects at least twice the number of women than men. This difference appears to be relatively consistent across a wide range of cultures, with an average of female patient to male patient ratio of 2:1 (Immerman & Mackey, 2003)

There are some factors, such as education level and abuse history, that may influence the chances of developing depression. Education is one construct that appears to factor into the development of a depression diagnosis. In a 2007 study, researchers found that, post cardiac surgery, women with a higher education level were diagnosed less frequently with depression than women with a less education (Doering, Cross,

Magsarili, Howitt, & Cowan, 2007). Also, women with an early abuse history are more likely to develop depression when compared to women without an early abuse history (Nolan, 2000).

Pain as the Most Prevalent Reason to Seek Medical Attention

In the United States, pain is one of the most prevalent explanations for seeking medical care. Gatchel and Oordt (2004) estimate that more than 50 million Americans seek medical attention for regulation of pain symptoms each year. However, a later study reports a much larger number. In a 2005 report, Turk and Burwinkle stated that in a 3-month period, approximately 200 million Americans reported a recent episode of low back pain, migraine pain, or neck pain. Pain symptoms account for a majority of physician visits, often more than 80% of all physician visits are derived from a pain episode. Turk and Burwinkle estimated that the prevalence of individuals seeking treatment with pain management physicians is close to half of the general population. They further estimated that approximately 2.9 million Americans are treated annually for a pain-related experience. This number is higher when other treatment modalities such as visiting a primary-care physician, choosing alternative medicine modalities, or utilizing over-the-counter medications, are sought to reduce some of the symptomatology. The average cost to the American health-care system of treating chronic pain is estimated to be between $100 and $150 million each year (Turk & Burwinkle, 2005). In addition, individuals with pain-related disability often miss work as a result of elevated levels of pain. Thus, pain-related disability coupled with medical costs is estimated to reach about $70 billion dollars annually (Gatchel, 2001).

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) now requires physicians to consider pain to be the fifth vital sign. In addition to blood pressure, pulse, body temperature, and respiration rate, the severity of pain must be documented. Although allowing for and documenting these vital signs is essential, no capabilities presently exist to measure pain. Using a pain scale to identify the severity of the pain episode is imperative; however, other issues also need to also be assessed. For example, in a comprehensive evaluation, the physical location of pain, the onset of pain symptoms and factors contributing to the aggravation or the alleviation of pain need to be elucidated. To complete the evaluation of pain, the individual must define a pain goal. Together with a physician appraisal of the pain, these components are collected and compiled for a complete evaluation of the pain episode.

The experience of pain. The pain experience as a whole is subjective. The subjectivity of the pain experience is composed of sensory, emotional and cognitive factors. Past experiences with pain leave a lasting impression and may also contribute to the intensity of pain. Feelings that accompany a pain event define the emotional construct forming the context of that pain event. Intensity, location, duration and quality of pain are sensory-level dimensions that need to be assessed. The patient's perception and terminology in describing the actual neurological pain event are important factors in understanding the patient's current pain experience (Gatchel & Oordt, 2004). Awareness, memory, and expectations are three concepts that contribute to the individual's perception of pain. Therefore, the physician must pay attention to the exact terminology used by the patient because specific terms can alert the physician to signs of depression, stress and anxiety. Augmented levels of stress and anxiety have been linked to augmented

pain intensity (Gatchel & Oordt, 2004). Delineating the unpleasant emotion within a pain episode is a difficult task as the onset of pain is typically the result of a threatening event. Some research has shown that the amount of negative symptomatology is linked to the intensity of pain (Price, 2000).

What Is Pain?

Throughout the years, there have been differing theories identifying the physiological basis of pain. The predominant theory of pain, put forth in the 1960s, and known as the gate control theory of pain, was developed by Melzack and Wall (Campbell, Clauw, & Keefe, 2003; Gatchel, 2005). The gate control theory of pain identified a multi-system evaluation of the pain experience. The perception of pain, as it is experienced, is transmitted to the brain along a neural pathway. The pain perception reaches the brain via the dorsal horn. The dorsal horn functions as a gating mechanism that transposes the pain perception to a pain sensation. The gating mechanism can be regulated by thoughts, feelings and behaviors.

As a beneficial foundation for understanding the physiological basis for pain, the gate control theory of pain introduced a relatively innovative manner by which to view pain. Melzack and Wall were the first to identify the importance of thoughts, feelings, and behaviors as they relate to the pain experience (Gatchel, 2005). Taking an innovative perspective on pain, the gate control theory of pain can be viewed as the first theory to consider psychosocial factors as they relate to pain (Gatchel, 2004).

In a later theory, Melzack (2005) expanded the gate control theory of pain to include models of stress and a diverse network of nerve impulses (Gatchel, 2005; Melzack, 2005). Melzack identified a more elaborate mechanism responsible for a pain

experience. He postulated that pain is a multidimensional construct based on the physiological make-up of nerve fibers that run parallel to one another (Melzack, 2005). He theorized that the psychological basis of pain is extensive and that many factors, such as genetic factors, situational factors, and sensory experiences can influence pain.

In his neuromatrix theory, Melzack (2005) refered to the neurons that link the thalamus to the cortex and the cortex to the limbic system as the neuromatrix. The neuromatrix is the seminal mechanism for identifying and imprinting the sensation of pain as it focuses on all aspects of a pain experience, namely, vestibular, visual and somatosensory sensations. Melzack accounted for individual differences in the establishment and maintenance of pain for each person. Gatchel (2005) suggested that a pain experience can be viewed as an acute stressor where the pain episode exacerbates other symptoms of pain thereby establishing the pain as a stressor. In an effort to return to homeostasis, the pain experience elicits a fear response. The fear response perpetuates the cycle by augmenting the stress response of the body (Gatchel, 2005).

The biopsychosocial model of pain is the first pain theory to incorporate physiologic, psychological and social factors as constructs that serve to maintain and/or perpetuate pain (Gatchel, 2005). This theory extends the previous discernment of pain by extending the comprehension of pain. The biopsychosocial model of pain includes the manner in which pain interacts on both a physiological and a psychological basis. The foundational underpinnings of this theory explicate a complex relationship of factors that serve to both maintain and perpetuate pain (Gatchel, 2001). Therefore, the biopsychosocial understanding of pain indicates that a physiopsychological assessment of pain is essential as an independent evaluation of physical or psychological components is

impossible (Gatchel, 2001). The biopsychosocial model of pain has been established as the most heuristic theory with which to conceptualize pain (Gatchel, 2005).

Definition of chronic pain. A chronic-pain diagnosis is multidimensional and, as such, affects the patient on many different levels. Within a pain episode, there are multiple dimensions of the pain, and each of the manifold implications of pain contributes to the experience in a diverse fashion. Within each experience, several different aspects of pain have the potential to affect the individual. Physiological implications, such as somatic and sensory factors, are features of pain that can interfere with activities of daily functioning. The affective dimension of pain contains the constant unpleasantness and emotional reaction to the pain as presented on a short-term basis. Subsequent to the affective dimension of pain lies the secondary affect of pain. This secondary affect of pain is termed from the characterizations of thoughts, such as unpleasantness and perceived forthcoming implications of pain, such as long-term suffering (Price, 2000).

Physical and psychosocial variables are impacted by chronic pain (Dysvik et al, 2005). There is a diverse manner in which pain affects an individual in a physical manner. For example, chronic pain may have an impact on the patient's physical behavior. The physical manifestations of the pain symptoms, also known as pain behaviors, may impede activities and have an overall restrictive effect on daily living. Individuals may no longer be able to continue in the same occupation, complete childcare tasks, or perform household chores. Sleep may be affected, possibly as a result of medication or lack thereof. Anxiety symptomatology manifesting in conjunction with the pain symptomatology or as a set of separate symptoms also may be present. For

example, pain can affect the manner in which an individual thinks and processes information, the manner in which an individual acts and reacts to situations, and the manner in which an individual physiologically responds to the pain.

Behaviorally, the individual may avoid situations because of the potentiality of experiencing pain. Another possibility for the individual's choosing to avoid situations that were previously pleasurable could be the deleterious effects of pain (Banks & Kerns, 1996). In part because of the pain, or the prodromal incident resulting in the chronic-pain state, the patient may not be able to engage in a previously established level of intimacy, sexual relations or normal exercise regimen. As the individual's previous level of functioning and participation in pleasurable activities continues to diminish, the individual often experiences more depressive symptomatology.

As the individual continues to endure the deleterious multidimensional ramifications of the experience of pain itself, deficits in other aspects of functioning are often found. For example, a 2003 study found a concomitant deficit in coping skills (Campbell, Clauw, & Keefe). This study identified an association between pain and maladaptive coping skills, specifically citing pain as a precursor to maladaptive coping skills (Campbell et al, 2003). Previous research has demonstrated a link also between pain and psychological disorders. Specifically, Banks and Kerns (1996) highlighted the ramifications of enduring consistent exposure to pain. These authors speculate that consistent exposure to pain may lead to a breakdown in effective coping mechanisms and negatively impact the psychological state of the individual (Banks & Kerns).

Diagnosis of Chronic Pain. There are differing definitions of what constitutes chronic pain; however, the physician typically guides the standard definition. A

diagnosis of chronic pain is made after the physician deems the patient to have fulfilled specific requirements, the first of which is duration. Chronic pain may be diagnosed after a pain episode has lasted for 6 months or longer. Although the physician reserves the right to use clinical judgment, the patient's self-report of pain longevity is heavily weighed. Pain quality and the extent of daily impact are further considerations. The quality of pain needs to be of moderate to severe intensity, and the pain must significantly affect daily living (Dysvik et al, 2005). Although terminal illnesses often encompass a chronic-pain component, a chronic-pain diagnosis is not given when the pain occurs in conjunction with a terminal illness. Given the multifaceted dimensions associated with pain and the impairment it can cause on daily living, pain can lead to more pain and often becomes a lifelong concern. Despite medical advances and available pharmacological interventions, most individuals diagnosed with chronic pain are not fully cured and hence will endure the pain into the future (Turk & Burwinkle, 2005).

Typically viewed as an aversive sensation by anyone inflicted with pain, a pain episode is regarded as a deleterious event with an identifiable biological basis. Pain itself can be indicative of a medical illness thereby causing an individual to look for an underlying medical causation of the pain. Chronic pain often signifies to an individual that the pervasive and constant pain may be resulting from a medical illness (Campbell et al, 2003). Pervasive and constant pain is not always perceived as a medical illness in and of itself; therefore, individuals within this population may need some assistance in identifying and addressing some of the ramifications of pain.

Individuals enduring persistent pain have been shown to demonstrate deficient coping strategies (Campbell et al, 2003). For example, one particular maladaptive coping

strategy, catastrophizing, has been linked with elevated rates of depression as well as with augmented rates of pain (Campbell et al., 2003). Potentially, the low self-efficacy these individuals have developed translates to the maladaptive coping strategies the individuals implement to combat the negative state of depression and the unpleasantness of the pain episode. Learned helplessness, another identified maladaptive coping strategy also has been linked to higher levels of pain and depression symptomatology, as individuals believe they do not have the ability to manage pain or combat depression (Campbell et al., 2003). In a population of pain patients with neuropathic pain, helplessness as a specific component of catastrophic thinking is perhaps the most concerning maladaptive coping strategy (Sullivan, Lynch, & Clark, 2005). Research has demonstrated that in one particular sample of patients with rheumatoid arthritis, the individuals who significantly overcatastrophized their pain levels also reported augmented levels of depression (Campbell et al., 2003). The most significant predictor of future pain is a feelings of helplessness. Within the helplessness dimension, catastrophic thinking was found to be a significant predictor of pain (Sullivan et al., 2005). In fact, catastrophic thinking related to pain is purported to serve as a psychological correlate and continue to be a source of disability in pain patients.

Rainveille, Carrie, Hofbauer, Bushnell, and Duncan (1999) reported a relationship between the perception of pain and physiological responses. Following merely a suggestion of a palliative substance, pain ratings decreased. Alternatively, when pain was suggested, the psychophysiological response increased. Unconscious pain suggestion increased both the perception of pain and the emotional symptomatology with

no apparent alteration of pain intensity (Rainville, Carrie, Hofbauer, Bushnell, & Duncan, 1999).

Objective/subjective measurement of chronic pain. Similar to the behavioral aspect of dealing with chronic pain, affective and emotional constructs are other areas of change the patient may experience. Living with physical pain is likely to have an impact on coping skills and reasoning abilities, as well as on participation in social activities. Effectively measuring the pain is imperative in order to facilitate a diagnosis and successfully measure the treatment progress (Grafton, Foster, & Wright, 2005). In addition to assessing pain levels, vital components imperative in adequately pain evaluation also include an assessment of disability and impairment (Gatchel, 2005).

One of the most common assessment tools used by physicians in a chronic-pain clinic, multidisciplinary practice, or pain-management practice, one of the most common assessment tools used by the physicians, is the McGill Pain Questionnaire (MPQ; Grafton et al., 2005). Developed by Melzack (1987), this measure was created to provide "valuable information on the sensory, affective, and evaluative dimensions of pain experience and is capable of discriminating among different pain problems" (p. 191). The completion of the MPQ requires between 15-20 minutes, which could be a struggle for some patients with chronic pain to complete expeditiously. Although some patients have reported have difficulty understanding the meaning of the vocabulary within the measure, the validity of the MPQ has been established by numerous studies (Grafton et al., 2005).

Taking both the time factor, and the complicated language of the MPQ into consideration, Melzack (1987) developed a shortened version of his original MPQ.

Melzack used some of the key descriptors from his original MPQ and developed the Short Form-McGill Pain Questionnaire (SF-MPQ). The self-administered SF-MPQ is used in both the clinical capacity and the research capacity and has an improved clinical utility (Grafton et al., 2005). The SF-MPQ was designed to adequately assess the affective and sensory modalities of pain that the patient is experiencing; however, there is no supportive research substantiating the factor structure (Grafton et al., 2005). There have been, however, studies supporting the criterion validity between the original MPQ and the SF-MPQ. Additionally, the SF-MPQ has demonstrated excellent reliability in the overall score as well as in the following specific categories: sensory, affective, and average pain level.

Treatment of Chronic pain

The current research on chronic pain provides information on the longevity and multidimensional nature of chronic pain. This research, although informative, further complicates treatment of chronic pain. The patient not only is living with constant pain that is oftentimes debilitating and life changing, but also is subjected to unfavorable scrutiny by others. Patients report that judgmental questioning regarding the medication portion of their treatment regimen often affects their medication compliance. While the medication may be helpful in assuaging some of the physiological aspects of pain, the questioning may be regarded as disparaging by the patient and unintentionally may instigate discontinuance of a medication (McCracken, Hoskins, & Eccleston, 2006). The noncompliant with the medication regimen may be followed by an exacerbation of pain symptomatology.

Pharmacological interventions for pain are often confounded by other factors. Medication use within the population with chronic pain is an established modality of treatment. McCraken et al., (2006) reported that medication used by the population with chronic pain becomes second nature and part of a routine. These authors continue by reporting that the choice to utilize pain medication is multiply determined. One determinant is personal and cultural morals influenced by beliefs. Affective manifestations and physiological responses also affect the decision. Patients with chronic pain are given medications to alleviate their physical pain sensation. These authors suggest the medication becomes habitually linked to the emotional mood of the patient as well thereby leading to a reliance on the medication. An increasing number of patients with chronic pain, slightly less than 50%, have expressed concern about a potential addiction to the prescribed pain medicine. Approximately 49% of the same population reported being suspicious of the physician responses they received regarding this particular treatment modality (McCracken et al., 2006).

Unfortunately, for a majority of chronic-pain sufferers, significant pain assuagement is not found. Traditional medicine, pharmacological interventions, surgical procedures, and even regional anesthesia may not relieve the pain (Turk & Burwinkle, 2005). Learning to adapt to their new situation and regain a homeostatic balance has been shown to be beneficial for these patients. Frequently chronic pain is exacerbated by poor adaptation to the pain situation, which in turn may lead to depression symptomatology, such as poor self-esteem (Dysvik et al., 2005). Depression, in turn, may lower the pain threshold and tolerance to pain (Zlot et al., 2000). Depression itself may hinder effective coping mechanisms. Treating the psychological basis of pain, therefore,

may assist in controlling the development of excessive pain symptomatology. Hence, to deal effectively with chronic pain, the individual must implement a new set of coping mechanisms (Dysvik et al., 2005). One effective manner through, which an individual can establish superior coping mechanisms is (CBT). Diverse cognitive and behavioral focused treatment modalities have been demonstrated to be efficacious for a population of patients with pain (Keefe, et al., 2000). In this context, CBT is useful to patients with pain by assisting them to reframe their perspective of pain and the subsequent impairment (Golden, Gatchel, & Glassman, 2010). For example, in a controlled study, daily observed pain scores were found to be lower in a group of adults with chronic fatigue syndrome after a course of CBT (Knoop et al., 2007). Researchers in the same study also found augmented activity levels in both adults and adolescents at the conclusion of CBT. The resulting data suggests that CBT treatments targeting negative thinking patterns can allay those negative cognitions and alleviate the total number of pain locations (Knoop et al., 2007).

Other types of CBT modalities have been shown to be efficacious as well. Altering the manner in which an individual perceives his or her pain by assisting the individual in understanding the role of thoughts, beliefs, and expectations as they relate to pain levels has resulted in positive outcomes (Campbell et al., 2003). Transforming cognitions aimed at alleviating pain and depression symptomatology has been shown to be beneficial in reducing the overall pain symptomatology (Campbell et al., 2003). When comparing a group of patients with pain being treated with CBT to a group of patients with pain being treated both pharmacologically with amitriptyline, and non-CBT therapy, results demonstrated that the group of patients being treated with CBT demonstrated the

most efficacious results (Campbell et al., 2003). A recent review of 35 multidisciplinary pain practices found the integrated approach, with CBT as a component, was superior to medical treatment alone (Scascighini, Toma, Dober-Spielmann, & Sprott, 2008).

Certain disorders on the pain spectrum are thought to be allied with changes in the central nervous system and thus indicate that psychosocial factors are influential components of the management of pain symptomatology (Campbell et al., 2003). Hence, CBT can be especially efficacious with disorders such as these. Specifically, disorders such as chronic fatigue syndrome, irritable bowel and fibromyalgia were found to have efficacious results when treated with CBT (Goldenberg, Burckhardt, & Crofford, 2004; Sharpe, 1998; Spiller et al., 2007).

To implement a new set of coping mechanisms, to relieve some of the depressive symptoms, and to assist in alleviating some of the chronic pain, the physician needs to recognize the depression and treat it as quickly as possible. Multidisciplinary pain-management teams have been found helpful with all of these difficulties (Turk & Burwinkle, 2005).

Multidisciplinary Pain Management Teams

Multidisciplinary pain-management teams typically consist of a physician, psychologist, midlevel provider, nurse, support staff, the patient and the patient's family. Together, the members of the team target the pain as an interrelated, complex unit. Psychosocial factors related to pain are targeted areas of treatment. Typically these programs implement CBT techniques to minimize the risk of psychological effects and to foster the forward motion of progress. Additionally, CBT will assist the patient in implementation of psychoeducational and behavioral strategies.

Comorbidity of Psychological Disorders

In patients with chronic pain, depression has been established as the most common comorbid condition (Poole et al., 2006; Tennen et al., 2006; Turner & Romano, 1984). The connection between preexisting depression symptomatology and subsequent pain episodes has been a well-established (Romano & Turner, 1985). The same research identifies co-occurring depression and pain symptomatology (Romano & Turner, 1985). Pain-clinic statistics report, the prevalence rates of depression ranging from 30 %-54% (Poole et al., 2006). In a population of patients who suffer from chronic back pain, for example, depression is a common concomitant factor, with a prevalence rate as high as 52% (Wesley et al., 1999). Episodes of back pain have been reported to be significant predictors of major depression (Currie & Wang, 2004). A study showed that 25.8 %-43.8% of a population of Hungarian women aged from adolescence to early adulthood reported a history of chronic headaches or musculoskeletal pain; 10 % of those women in that sample also reported depression symptomatology (Rethelyi et al., 2004).

Reciprocal influences. There is a high correlation of physiological components shared between depression and pain (Banks & Kerns, 1996). For example, common concomitant symptoms include sleep disturbances and anhedonia (Sullivan, Reesor, Mikail, & Fisher, 1992). Also, depression may manifest as an aching pain, such as a backache or a headache. As this symptomatology is present in both pain and depression, identifying the etiology of the symptoms may be difficult. This difficulty further complicates the diagnosis and treatment. Therefore, the inaccuracy in identifying pain versus depression symptomatology resulting from indistinguishable symptoms, may lead to the inconsistencies in these findings (Brown, 1990).

There is a significant overlap in symptomatology when patients present in medical offices (Campbell et al., 2003). The overlap and similarity between pain and depression symptomatology often confound the diagnosis of depression and contribute to the arduousness of making the diagnosis. Pain is often a stressor that contributes to the instigation of an episode of major depression (Banks & Kerns, 1996). The pain experience itself is sometimes viewed as the instigating event that precipitates a mood episode (Currie & Wang, 2004; Ohayon & Schatzberg, 2003). The pain and depression relationship can be reversed and a depressive episode can be regarded as a precursor to a pain episode (Ohayon & Schatzberg, 2003).

The strength of the relationship between pain and depression has been demonstrated to become more intense when pain develops subsequent to a depressive episode and pain has the potential to exacerbate a depressive episode (Rush, Polatin, & Gatchel, 2000). Greater pain levels have been demonstrated to have an impact on the longevity of a depressive episode, increasing the length of the symptomatology (Karp et al., 2005). Pain levels may increase if either one of the circumstances worsen (Bair et al., 2003). Lepine and Briley (2004) conducted a meta-analysis demonstrating the significant prevalence of depression within a population of patients with pain, both pervasive and acute. Reciprocal influences, the occurrence of pain within a population of individuals diagnosed with depression were also demonstrated to be significant (Lepine & Briley, 2004). Specifically, adolescents diagnosed with depression have been shown to have a 10 times greater risk of developing headaches when compared to nondepressed adolescents (Pine, Cohen, & Brook, 1996). A review of United States health statistics demonstrated that depression symptomatology found in an earlier study doubled increased the chances

of developing pain by the next review (Magni, Moreschi, Rigatti-Luchini, & Merskey, 1994).

The severity of pain also plays a role in the onset and duration of a depressive episode. Lepine & Briley (2004) suggested that chronic pain should be viewed as a symptom of depression, and that a full remission of the depressive episode will be achieved only subsequent to the assuagement of the pain episode. Therefore, the concomitant relationship between pain and depression appears to extend past the onset of a mood episode to affect the length of the mood episode as well. For example, Ohayon and Schatzberg (2003) found when reviewing a population of people with both pain and depression symptomatology, those reporting sadness as an overall mood state were likely to identify additional pain symptomatology. This finding suggests that sadness and depressive feelings may be more indicative of a depressive episode in a population of patients with pain. Researchers in this study also found more than 75% of the study participants reported symptoms of depression and pain in equal amounts. Depressive symptomatology was found to be higher in women than in men. As a result, women were also more likely than men to be diagnosed with a mood disorder (Ohayon & Schatzberg, 2003).

Different types of depression and pain symptomatology. Pain and depression share a great deal of symptomatology. It is not uncommon to find overlapping symptoms thus leading to the laborious job of delineating symptomatology (Banks & Kerns, 1996). These concomitant symptoms often interfere with a diagnosis of depression. Bair et al. (2003) have shown that depression symptomatology presented in physicians' offices will often manifest in physical complaints, thereby further confounding the diagnosis. The

symptomatology indicative of depression that is most often seen in a primary-care physician's office often incorporates patient reports centering on pain symptoms. The pain symptoms that are reported contribute to the arduous task of determining a depression diagnosis. The concomitant symptoms that often are guised as complaints of pain symptoms typically include fatigue, insomnia and a variety of nonspecific pain symptoms. Research has demonstrated that the likelihood of a depression diagnosis is higher when individuals identify multiple physical complaints (Bair et al., 2003).

Lepine and Briley (2004) suggest that only the psychological aspects of depression are assessed in the *Diagnostic and Statistical Manual of Mental Disorders*. These authors question the exclusion and inclusion aspect of pain symptomatology when assessing depression symptomatology given the established comorbidity of symptoms (Lepine & Briley, 2004).

Depression diagnosis as an arduous task. Depression will complicate the prognosis of chronic pain; yet, there are similarities in diagnostic criteria between depression and chronic pain (Poole et al., 2006). Specific examples include somatic symptoms such as sleep disturbances, and quality-of-life indicators, such as loss of interest in previously enjoyable activities. Often, the symptomatology between both conditions is similar. Delineating the potentiality of either condition existing independently of the other, then, becomes difficult. Therefore, the primary-care physician's delineation task becomes more arduous (Bair et al., 2003).

The connection between pain and depression is further exemplified in areas of somatic function and negative views of self (Tennen et al., 2006; Zlot et al., 2000). There is a link between depression and unexplained pain (Bair et al., 2003). Individuals

diagnosed with depression often will have higher rates of unexplained pain than individuals without depression. Research has also shown that depression influences pain and that pain can predict a depressive episode in individuals with a prior history of depression (Tennen et al., 2006). These reciprocal influences demonstrate an established connection between depression and chronic pain. Individuals within a depressive episode will present more often in a family practitioner's office with pain symptomatology than individuals not in a depressive episode (Bair et al., 2003). As the pain state itself can be viewed as a symptomatic condition it can often confound the identification of depression (Banks & Kerns, 1996).

Shared neurotransmitters. Although there are numerous neurotransmitters, the manner in which many of them affect co-occurring pain and depression symptomatology is still unknown. One study identifies four common neurotransmitters found in both pain and depression (Campbell et al., 2003). Serotonin, for example, has been found to have both a pronociceptive and an antinociceptive quality on pain and when levels of serotonin are low, this neurotransmitter is linked to elevated rates of depression (Campbell et al., 2003). Similar to serotonin, norepinephrine has been shown to demonstrate an antinociceptive quality on pain. When norepinephrine is low, this neurotransmitter is linked to a reoccurrence of depression (Campbell et al., 2003; Gold & Chrousos, 2002). Substance P also has been demonstrated to be a link between pain and depression. Augmented levels of Substance P have been found in psychological disorders and pain states as well (Campbell et al., 2003). When tissue is inflamed, corticotrophin releasing factor, a fourth identified neurotransmitter, has been demonstrated to increase rates of depression (Bale & Vale, 2003; Campbell et al., 2003).

Research by Wells-Federman, Armstein and Caudil (2002) has shown a correlation between patients with chronic pain and both depression symptomatology and depression. The empirically validated treatment approach to the comorbid disorder of depression in the context of chronic-pain treatment is CBT. The earlier that depression is detected and CBT techniques are implemented, the better the prognosis for the patient in the overall treatment of chronic pain. According to Wells-Federman et al. (2002) psychoeducation aimed at helping the patient to develop effective coping mechanisms to deal with the emotional, cognitive, behavioral and physical aspects of chronic pain may help to minimize the course of pain and depression.

Pain as a precursor to depression. Pain and depression have been established as concomitant conditions with comorbidity as high as 30%-54 % (Poole et al., 2006). In a recent study the comorbidity was found to be 44.5 % and included pain disorders such as chronic pain, osteoarthritis and headaches (Ani et al., 2008). Throughout the world, numerous studies have demonstrated the link between depression and chronic pain. A study conducted within a population of patients with rheumatoid arthritis found that this group demonstrated significant elevations of depression symptomatology (Brown, 1990). This depression finding was further generalized in a different group of patients with rheumatoid arthritis. In this subsequent study, results demonstrated that prior to the onset of rheumatoid arthritis, one episode of depression puts the individual at risk for augmented levels of depression after being diagnosed with rheumatoid arthritis (Vaeroy, Tanum, Brauset, Morkrid, & Forre, 2005).

This finding has been further expounded upon in a wide range of patients with pain. In a recent study conducted in Turkey, women diagnosed with chronic pelvic pain

were reported to have higher levels of depression than those in a control group of pain-free women (Kaya et al., 2006). The depression may be related to sensory, emotional and cognitive pain factors. Lewandowski, Palermo, and Peterson (2006) established a link between depression and children and adolescents with recurrent head pain and other forms of chronic pain. Those authors noted that children and adolescents with a chronic form of pain have more difficulty engaging in and completing age-appropriate behavioral, mental, and social activities as a result of both their chronic pain and depression symptoms. A longitudinal study substantiates these results by identifying depression as more common in a group of adolescents additionally reporting chronic headaches when compared to nondepressed adolescents (Pine et al., 1996). Therefore, assessing for depression at the outset of treatment and throughout the course of treatment may help clinicians to detect behavioral activities, distorted thinking and negative health habits that may assist them in understanding the patient in a comprehensive manner.

Suicidality. Fishbain, Cutler, Rosmoff and Rosmoff (1999) conducted a meta-analysis of 83 studies. Specifically delineating the comorbidity of depression in a population of patients with chronic pain, they found there was indeed a higher incidence of depression within this population. These authors concluded that the higher incidence of depression may foster higher suicidal ideations in this population. Extending that research, Fishbain (1996) then reviewed 18 articles searching for patients with chronic pain and suicidality as a corollary. In addition to depression, there is a symptomatology overlap between chronic pain and suicidality. Reported feelings of worthlessness, sleep issues and anxiety symptoms were found in both patients with chronic pain and suicide attempts and completions. Fishbain found a higher incidence of suicidality in a

population of patients with chronic pain and concluded that chronic pain may be regarded as a risk factor for suicidality and that a psychological consult is imperative (Fishbain D. A., 1999).

Assessment of Depression in a Patient with Chronic Pain

A meta-analysis of the prevalence of depression in primary-care practices by Pignone et al. (2002) has revealed that two diverse manners of obtaining an appraisal of depression symptomatology have proved to be beneficial in detecting depression within this population. Two separate but equally brief self-report measures have been deemed to be reliable indicators of depression symptomatology. Independent of a measure itself, significant indicators of depression can be found by querying the patient. Specifically, the physician may query the patient regarding depressed mood or hopelessness over the past 2 weeks either concomitant with or independent of a loss of pleasure over the past 2 weeks (Pignone, et al., 2002).

Recently, the United States Preventive Services Task Force conducted an analysis of depression research studies, compiled the studies and expounded the pertinent research. Intervention was demonstrated to be better than a no-treatment control when depression is reassessed (Pignone, et al., 2002). This task force deemed by this task force that to optimally benefit the patient, depression was best served when a physician assessed for symptoms and facilitated treatment because depression screening measures provide the physician or assessor with specific symptomatology. Once elucidated, the specific symptomatology identified can assist the physician in ruling out a physiological cause of the depression symptoms (Pignone, et al., 2002).

Beck Depression Inventory. To detect depression symptoms in a population with chronic pain depression symptomatology is most frequently assessed through a self-report measure. The most commonly used self-report measure has been the Beck Depression Inventory (BDI) (Reynolds & Gould, 1981). Used within various populations, including medically ill, psychiatric, and generally healthy populations, the BDI is a self-report measure consisting of 21 items, of which each correspond to a specific collection of cognitions and physical symptomatology (Doering et al., 2007; Reynolds & Gould, 1981). The BDI is a measure that is effective in measuring the intensity of depression symptomatology (Doering et al., 2007).

Beck Depression Inventory-II. The BDI-II is an updated version of the original BDI and gives a more accurate reflection of the depression criteria in the *Diagnostic and Statistical Manual of Mental Disorders-IV-TR (DSM-IV-TR)*. The BDI-II assesses for the concomitant existence of depression symptomatology, specifically the presence, and severity of depressive symptoms in the population with chronic pain (Poole et al., 2006). This measure is currently the principal tool used to diagnose depression.

The BDI-II has been validated on adult and adolescent psychiatric patients, family-medicine patients, and other medical outpatients. In addition, the BDI-II has been validated on various populations with chronic pain such as those with neuropathic pain, neurovascular pain, and back pain (Poole et al., 2006). To date only a small sample of studies have been completed addressing the factor structure of the BDI-II in the population with chronic pain.

Beck Depression Inventory--FastScreen. The BDI-FastScreen is a shortened version of the BDI-II. This measure, a derivative of the original BDI, was designed using

a combination of cognitive and affective symptoms of depression (Beck, Steer, & Brown, 2000; Doering et al., 2007). Based on the most current edition of the DSM-IV-TR the BDI-II is the most prevalent measure used to identify depression. Using the BDI-II as a foundation, the BDI-FastScreen was developed as a rapid measure that would factor out neurovegetative signs of depression found in a medical population and concentrate on those factors of depression that relate soley to depression. This measure was specifically developed to factor out co-occurring depression symptomatology that may be related to a medical condition (Beck et al., 2000; Steer et al., 1999). Within the medical population, the BDI-FastScreen has been shown to differentially detect depression symptomatology (Beck et al., 2000; Steer et al., 1999).

The directions for completing this measure request the informants to describe themselves "Over the past two weeks, including today." Items placed on this measure were chosen for their ability to reveal significant indications of risk. The seven specific items on this measure include *sadness, pessimism, past failure, loss of pleasure, self-dislike, self-criticalness,* and *suicidal ideations* (Beck et al., 2000; Steer et al., 1999). This measure takes approximately 2 minutes to complete.

The BDI-FastScreen utilizes 7 items to measure the cognitive and affective components of depression. The patient completing the measure rates each of these seven items on a 4-point scale ranging from 0 - 3, where a score of 3 indicates a significant amount of distress relating to that particular symptom. By summing the ratings on all seven items, one can compute a total score for the measure. The highest possible total score on this measure is 21 (Beck et al. 2000; Beck, Guth, Steer, & Ball, 1997). Depression, therefore, is significant at a much lower score when compared to the score on

the BDI-II (Doering et al., 2007). For example, on the BDI-FastScreen, scores greater than 4 indicate a mild depression.

Internal structure of the BDI-FastScreen. When choosing the items to be placed on the BDI-FastScreen, Beck et al. (200) first identified required symptomatology per the DSM-IV-TR. Looking at required symptoms, these authors identified the first two critical items namely, anhedonia and sadness. According to the DSM-IV-TR, one of these two items is essential to the diagnosis of depression (Beck, Steer, & Brown, 2000). Given the imperativeness of identifying risk factors of suicide, suicidality is assessed in this measure as well and thus makes up the next factor. The remaining items were identified and categorized from a factor analysis conducted with the BDI-II. A factor analysis was completed with a sample population of 620 people consisting of psychiatric patients and college students, although the latter comprised less than 20% of the sample population. The four cognitive factors, pessimism, past failure, self-dislike and self-criticalness, demonstrated significant factor loadings (> .35) when the BDI-II was developed (Beck et al., 2000). Therefore, these four items constitute the cognitive domain of the measure and complete the seven items.

The original study piloting the BDI-FastScreen elucidated a coefficient alpha of internal consistency at 0.86, thereby demonstrating good reliability (Beck et al., 1997). Beck extended his research on this measure to include medical samples from family practices, internal medicine practices, pediatric practices, and consultation liaison. The coefficient alpha scores in these medical populations further demonstrated good reliability with scores ranging from .85 - .88 (Beck et al., 2000). When Beck et.al. (1997), compared the BDI-FastScreen with another standardized measure of depression,

the BDI-FastScreen was positively related at 0.62, $p < 0.001$ thereby demonstrating notable convergent validity (Beck et al., 1997). Finally, the BDI-FastScreen was a proficient instrument in identifying symptomatology consistent with depression. Therefore, on the basis of internal consistency, convergent validity and differential diagnosis, the BDI-FastScreen established itself as an effective measure in factoring out neurovegetive signs of depression found in the medical population and in illuminating the depressive symptomatology. Beck, et. al. (1997) suggests progressive research utilizing this measure should concentrate on the utility of depression diagnosis within a diverse group of medical patients.

Prior research implementing the BDI-FastScreen. A paucity of studies has been conducted validating the effectiveness of utilizing the BDI-FastScreen within a population of patients with pain. Most of the research conducted with this measure has utilized a more general medical population, including inpatient and outpatient samples. For example, a group of researchers reviewed the effectiveness of the BDI-FastScreen within a population of HIV-infected patients. These researchers found the BDI-FastScreen to have good internal consistency, thereby demonstrating its effectiveness in identifying depression symptomatology in this population of HIV-infected individuals who also reported high levels of pain (Krefetz, Steer, Jermyn, & Condoluci, 2004). In another study, the BDI-FastScreen was compared to Hospital Anxiety and Depression Scale (HADS) and the BDI-II in a population of patients with hepatitis C. The results of this study indicate a Chronbach's alpha score of.85 with this population was lower than the previously indicated .84 (Golden, Conroy, & O'Dwyer, 2007). Utilizing a Receiver Operating Characteristic (ROC) curve and examining the ability of the BDI-FastScreen to

accurately assess depression symptomatology was an additional area of validity assessed in this study. This assessment measure identified .85, demonstrating the BDI-FastScreen was accurately able to distinguish the depression symptomatology (Golden et al., 2007). A third study used the BDI-FastScreen to assess for depression symptomatology in a geriatric group of stroke survivors (Healey, Kneebone, Carroll, & Anderson, 2008). Again, acceptable internal consistency was demonstrated in this study (Healey, Kneebone, Carroll, & Anderson, 2008). These researchers also looked at the test-retest reliability and found positive results as well (Healey, Kneebone, Carroll, & Anderson, 2008).

Researchers from the United Kingdom compared the BDI-II and the BDI-FastScreen within a group of patients with chronic pain in an attempt to demonstrate the usefulness of the BDI-FastScreen as it relates on a measure-to-measure consistency. The researchers found that eliminating some of the questions on the BDI-II decreased the chances of patients not answering a question or superficially inflating the scores (Poole, Bramwell, & Murphy, 2009). The results indicate the BDI- FastScreen is a fair measure of depression within this population. Although resulting in adequate internal consistency, the .84 is a lower internal consistency than was found by measure author, Beck. These results could potentially be attributed to the low number of patients with pain included in the original study conducted by Beck. The resulting data from this comparison indicate that the BDI-FastScreen is a more useful measure than the BDI-II and that the shorter measure serves to decrease the time burden on the patient (Poole et al., 2009).

A recent study by Doering et al. (2007) demonstrated the effectiveness of the BDI-FastScreen when used to assess depression in women post cardiac surgery.

Resulting data from this study indicate the BDI-FastScreen is a useful tool to detect depression in this population. Most of the studies elucidated previously have incorporated adult populations; however, the effectiveness of screening for depression symptomatology within a population of adolescents has been demonstrated as well by Winter, Steer, Jones-Hicks, & Beck (1999). Their research suggests the BDI-FastScreen can be utilized to assess for depression symptomatology in a normative sample of nonmedical adolescents aged 12-17 years.

Sharpe and Lipsky (2002) noted that although the completion time on the BDI-FastScreen is minimal, the sensitivity of the measure may be affected. However, the BDI-FastScreen has been shown to differentially diagnose depression within the medical population (Beck et al., 2000; Steer et al., 1999). Specifically, in a 1999 study, Steer et al. demonstrated that the BDI-FastScreen with a score of 4 and above ascertained the highest clinical efficiency of 98%. The corresponding specificity and sensitivity rates of 98% and 97%, respectively, in signifying major depression disorder within a group of outpatients elucidates the effectiveness of the BDI-FastScreen, has in identifying depression symptomatology. This study supported a previous internal consistency of 0.85 (Steer et al., 1999).

Detecting Depression in the Patient Sample

In patients with chronic pain, depression has been established as the most common comorbid condition (Poole et al., 2006; Tennen et al., 2006). Pain-clinic statistics report prevalence rates of depression ranging from 30% - 54% (Poole et al., 2006). In the population with chronic back pain, for example, depression is a common concomitant factor, with a prevalence rate as high as 52% (Wesley et al., 1999). A

psychological diagnosis, including depression symptomatology, often portends a less favorable prognosis for treatment of some medical disorders. Depression has been demonstrated to complicate the prognosis of chronic pain; yet, there are similarities in diagnostic criteria between depression and chronic pain (Poole et al., 2006). The connection between pain and depression is exemplified in areas of somatic function and negative views of self (Tennen et al., 2006; Zlot et al., 2000). Specific examples include somatic symptoms, such as sleep disturbances, and quality-of-life indicators, such as loss of interest in previously enjoyable activities. Research also has shown that depression influences pain and that pain can predict a depressive episode in individuals with a prior history of depression (Tennen et al., 2006). These reciprocal influences demonstrate an established connection between depression and chronic pain.

The concomitant relationship between depression and chronic pain symptomatology has been well established (Poole et al., 2006; Tennen et al., 2006; Wesley et al.,1999). The benefits of early intervention techniques targeting the depression also have been established (Dysvik et al., 2005). Identifying negative health habits, detrimental behavioral activities and possible distorted thinking that may accompany both depression and chronic pain symptomatology may then facilitate a better prognosis and minimize convalescence time. When assessing for depression, the physician must look at cognitive, affective, somatic, and behavioral components.

Physicians' Ratings of Depression

Depression is a condition that is underdiagnosed by most physicians (Penn, Boland, McCartney, Kohn, & Mulvey, 1997). According to Ani et al. (2008), approximately two thirds of primary-care physicians have been found to demonstrate

difficulty in detecting depression. Their 2008 study comparing physician ratings of depression and patient ratings of depression found that physicians underdiagnosed depression symptomatology. In fact, they found that physicians detected only 31% of patients as depressed, though a depression measure more than doubled that number at 75% (Ani, et al., 2008).

When asked by Penn et al. (1997), physicians attributed the high rate of underdiagnoses of depression to their own uncertainty regarding specific depression nomenclature. In addition to their perceptions regarding the ambiguity of the DSM or the *International Statistical Classification of Diseases and Related Mental Health Problems* (ICD) depression criteria, physicians also identified financial compensation subsequent to a psychiatric diagnosis as a concern. According to physicians' self-reports, the underdiagnosis of depression primarily is the result of physicians' uncertainty of depression criteria and fear of undercompensation (Penn et al., 1997).

Results of a study with a sample population consisting of psychiatrists and primary-care physicians, including internal medicine doctors, indicate that physicians still demonstrate a lack of expertise when diagnosing major depressive disorder (Penn et al.,1997). According to World Health Organization statistics, primary care physician's have been found to diagnose depression more often than other physician's, identifying nearly 80% of the cases (Freeman et al., 2010). However, approximately half of the individuals diagnosed with depression do not meet the criteria outlined in the *International Statistical Classification of Diseases and Related Mental Health Problems* (ICD) (Freeman et al., 2010). Missing the symptomatology of depression and consequently misdiagnosing or underdiagnosing an episode of major depression can

augment the mortality of this prevalent, but treatable, mood disorder (Penn et al., 1997). Depression is related to sensory, emotional and cognitive factors of pain. Assessing for depression at the outset of treatment and throughout the course of treatment may help clinicians to detect behavioral activities, distorted thinking and negative health habits that may assist them in understanding the patient in a comprehensive manner.

Physicians' Ratings of Pain

Pain is frequently a co-occurring symptom or often an extension of a pre-existing medical disorder. When assessing a group of medical personnel regarding pain control in a population of patients with cancer, von Roenn et al. (1993) found 86% of the participants reported that patients' pain levels were not being adequately treated. Physicians queried in this study reported approximately 48% of the patients they had contact with endured pain longer than 30 days. Physicians rate poor pain assessment as the largest indicator of inadequate pain management (von Roenn, Cleeland, Gonin, Hatfield, & Pandya, 1993). A study conducted with a group of physicians extrapolated a result demonstrating a patient's low self-report of pain intensity or high self-reported pain intensity was not believed by his or her physician (Tait & Chiball, 1997). If the physician discounts the patient's perceived level of pain, the pain level may persist leaving the patient to contend with augmented pain levels.

Tait and Chiball (1997) revealed that when patients reported high levels of pain, high pain intensity and significant emotional distress, medical personnel tended to disbelieve the patient self-report. Specifically, the patient's circumstances surrounding a pain episode and the patient's relationships with the physician appeared to affect the physician's appraisal of the present pain episode. These results appeared to also be

similar also in nonmedical settings, as this same construct had been demonstrated within a group of nonmedically trained individuals. These individuals tended to disregard the described high level reported by individuals. Physicians expressed more doubt when a patient reports elevated pain levels (Tait & Chiball, 1997).

Physicians form opinions about their patient with pain by relying on aspects of the patient's personality and the circumstances surrounding the appointment (Tait & Chiball, 1997). Prior research has demonstrated that some physicians may have preconceived expectations of the patients reported pain levels. According to Galer, Schwartz, and Turner (1997), patient's self-report of pain relief is related to the physicians' beliefs regarding pain reduction. Physicians then, appear to be significant indicators of post procedure changes in pain levels. In fact, physicians may subtly convey pain expectations to patients thereby suggesting to the patient the perceived pain outcome (Galer et al., 1997).

Previous research suggests that a clear medical reason for pain is more believable to the medical professional than pain presenting for an undetermined reason (Marquie et al., 2003; Tait & Chiball, 1997). When physicians from assorted disciplines are given a list of pain descriptors, all the physicians agree on which descriptors identify pain. However, there appears to be a discrepancy between the results within a population of patients experiencing an acute pain episode and those experiencing chronic pain (Tearnan & Dar, 1986). Physicians report acute pain as negatively impacting a mood state, and activity level as being more painful than those individuals with more chronic symtomatology. In fact, physicians report a positive attitude toward utilizing pain descriptors in terms of patients with acute pain, but not with patients with a more chronic

pain symptomatology (Tearnan & Dar, 1986). When pain is the result of an identified cause, physicians interpret the pain with a higher degree of acumen than if the pain results from a more indistinguishable cause (Marquie et al., 2003).

A study by Weisse, Sorum, & Dominguez (2003) examined the influence of race and gender on physicians' pain-treatment choices. Using common pain-related conditions, this study compared the gender of both physicians and patients while assessing pain-treatment choices. These researchers found that male physicians, as opposed to female physicians, prescribed more narcotic pain medication to both female and male patients. However, within the patient genders, male physicians were shown to prescribe lower doses of analgesic to female patients than to male patients. Conversely, female physicians, when compared to male physicians, gave lower doses of narcotic pain medication to male patients than to female patients. In this study, African American women were prescribed the lowest doses of pain medication (Weisse et al., 2003).

The role of gender may play a part in identifying and appraising pain levels in an emergency-room setting. When a male physician identified the cause of a female patient's pain, the physician interpreted the female patient's pain to be lower than that of a male patient (Marquie et al., 2003). However, the opposite was true when the origin of the pain was indistinguishable. In this situation, a male physician interpreted a female patient to have a higher pain experience than that of a similar male when there was an identified cause for the pain episode (Marquie et al., 2003).

In an emergency room setting, physicians rate patients' pain lower than patients themselves rate the pain. Patients tend to report highest pain levels at the outset of the

relationship (Marquie et al., 2003). Similarly, physicians also identify patients to have higher pain levels at the beginning of a course of treatment (Marquie et al., 2003).

There also appears to be a discrepancy between male and female physicians and the manner in which each interpret pain episodes. When female physicians identified the cause of a female patient's pain, that physician rated the pain the same for a male and female patient. Conversely, when the origin of a female patients pain was not known, the female physician interpreted the pain level to be lower than the patient themselves interpreted the pain (Marquie et al., 2003).

Pain Differences Across Cultures

Various studies have demonstrated the difference of pain symptomatology across cultures. A study conducted by Green, Baker, Smith and Sato (2003 B) revealed specific differences when they compared African Americans' self-reported pain levels to those of a Caucasian sample of patients with pain. This study identified significantly elevated levels of pain, suffering, and loss of control for the African American sample. Similar findings have been elucidated. Comparatively, African Americans reported significantly more pain than that by their Caucasian counterparts (Green, Baker, Sato, L., & Smith, 2003). Riley et al. (2002) also found that African Americans report higher levels of pain unpleasantness and pain behaviors. African Americans additionally tend to report more depressive symptoms (Green, Baker, Smith, et al., 2003; Riley et al., 2002). A study by Green, Baker, Sato et al. (2003) revealed that African Americans reported more sleep disturbances, including initiating sleep and staying asleep, than did Caucasians. This study also demonstrated that pain manifests differently in both groups as well. Within the Caucasian, nonHispanic group, pain presented with more mood symptoms, such as

sadness and anhedonia than within the African American group. African Americans, conversely, reported mood symptoms of irritability and anxiety. Overall, these results suggest that a pain experience is different among Caucasian, nonHispanic and African American patients with pain even when other factors are controlled for (Green, Baker, Sato et al., 2003).

Psychosocial dimensions of pain also have been demonstrated to vary within different ethnic groups. Some studies have demonstrated that African Americans, when compared to Caucasians, reported more pain that interfered with activities of daily living (Cano, Mayo, & Ventimiglia, 2005; Ruehlman, Karoly, & Newton, 2005). In one specific study, these individuals also reported more pain-related disability when compared to their Caucasian counterparts (Cano et al., 2005). Weisse et al. (2005) found that women and African American individuals reported higher pain levels than those reported by Caucasian men. African Americans reported more unpleasantness depending on the gender of the experimenter. Specifically, female experimenters generated more unpleasantness than that generated by male experimenters. A discrepancy in pain reports depending on the ethnicity of the experimenter was also recorded. Female subjects rated the task of identifying pain levels as more unpleasant when the experimenter was a male African American than when the experimenter was a male Caucasian. The authors postulated that African Americans and women receive lower doses of pain medication; however, this group experienced increased pain intensity and unpleasantness (Weisse, Foster, & Fisher, 2005).

Nguyen, Ugarte, Fuller, Haas, & Portenoy (2005) conducted a national cross-sectional phone survey to ascertain the influence of ethnicity on access to pain

management treatments. They found that Hispanics were significantly less likely than African Americans or Caucasians to seek medical attention from their primary-care physician. Of the 1,335 study participants, results demonstrated that African Americans (85%) and Caucasians (84%) would seek treatment 85% and 84% of the time respectively. Hispanics, on the other hand, would only seek treatment only 70% of the time (Nguyen et al., 2005).

Another study examined the utility of commonly used pain measures within a sample of ethnically diverse individuals (Fuentes, Hart-Johnson, & Green, 2007). Specifically, this study examined the usefulness of identifying pain with the following measures in two ethnic groups. The authors chose the McGill Pain Questionnaire, the Pain Disability Index, and the Brief Symptom Inventory to make the comparisons. This study included African Americans and Caucasian participants who were examined in a chronic-pain clinic. The results of the study demonstrated that African American individuals and individuals with a lower education did not complete all the McGill Pain Questionnaire items (Fuentes et al., 2007). Results of another study revealed that participants with higher levels of education report less pain and pain-related disability (Cano, Mayo, & Ventimiglia, 2005). Education was viewed as a mediator of pain behaviors. A study attempting to delineate if experimenter race and gender in addition to participant gender and race biased participant pain levels (Cano et al., 2005).

Coping has been related to a patient's perceived ability to deal effectively with pain (Cano et al., 2005). Researchers have demonstrated that individuals with pain differ in coping strategies and that specific pain-coping strategies differ across cultures (Cano et al., 2005).

Most Efficacious Results

Researchers have long postulated that psychological factors affect the course and intensity of pain (Turk, Meichenbaum, & Genest, 1983). These factors not only impact the course of the disease but also possess the potential to affect patient appraisals of the disorder and the physiological underpinnings of the disorder as well (Turk et al., 1983). The most efficacious results of treating depression are obtained when the depression is identified and treated early (Campbell et al., 2003). The most efficacious treatment of early-detected depression has been demonstrated to be psychotherapy (Freeman et al., 2010). In a study by Miranda et al. (2003) of an impoverished and culturally diverse sample of women, better psychosocial functioning was achieved when depression was detected early and treated with psychotherapy. This concept was elaborated upon in a follow up study, again with a population of impoverished minority women (Miranda et al., 2006). Efficacious results were found when depression was treated with medications and CBT. In fact, more than 50% of the women in the study were not clinically depressed at a 1-year follow-up as measured by a depression inventory (Miranda et al., 2006).

Statement of the Problem

The concomitant relationship between depression and chronic-pain symptomatology has been well established (Poole et al., 2006; Tennen et al., 2006; Wesley et al., 1999). The benefits of early intervention techniques targeting the depression have also been established (Dysvik et al., 2005). Identifying negative health habits, such as drug or alcohol abuse or limited physical activity, detrimental behavioral activities such as smoking, and possible distorted thinking that may accompany both

depression and chronic-pain symptomatology may then facilitate a better prognosis and minimize convalescence time.

There has been a lack of research regarding the factor structure and psychometric properties Beck Depression Inventory (BDI) in a population of patients with pain. Although the BDI is the most common measure administered to assess depression in the general medical population, there is a limited amount of research validating the psychometric properties of the BDI-FastScreen within the pain population. Therefore, this study is purporting to identify the factor structure of the BDI-Fast Screen. Specifically, this study is attempting to correlate the factor structure of the BDI-FastScreen to the factors on the encounter form and the physician appraisal of the patient. Data collected will additionally elucidate the relationship of patient and physician appraisal, demographic information, and the characteristics of the individual patient with pain, such as age, gender, diagnosis, onset and duration.

Chapter 3

Hypotheses

This study will examine the factor structure of the BDI-FastScreen within a sample of patients with pain and evaluate how this measure relates to patient and physician appraisal, demographic information, and characteristics of the individual patient with pain such as age, gender, diagnosis, onset and duration.

Hypothesis 1

There is a unique factor structure on the BDI-FastScreen for patients with pain. It is expected, given the established concomitant relationship between pain and depression, that one overall cognitive item will emerge as the predominant feature.

Justification. The BDI-FastScreen was developed to factor out neurovegetative signs of depression found in a medical population and concentrate on those factors of depression that relate soley to depression. This measure was specifically developed to factor out co-occurring depression symptomatology that may be related to a medical condition (Steer et al., 1999). Within the medical population, the BDI-FastScreen has been shown to differentially detect depression symptomatology (Steer et al., 1999). A factor analysis of the data will expound the observed data by demonstrating how each of the factors together elucidate the relationship between depression symptomatology found in patients with pain. This statistical analysis will additionally explicate the character of the factor.

Hypothesis 2

Female patients with pain will have a significantly higher score on the BDI-FastScreen than that of male patients with pain at the outset of the pain evaluation.

Justification. The lifetime prevalence rates of depression are different for adult men and women. A 1993 review of the National Comorbidity Survey revealed a lifetime prevalence rate of depression at 12% higher for women than men (Kessler et al., 1993). Women tend to have a higher lifetime prevalence rate further indicating increased rates of depression. Previous results have demonstrated lifetime prevalence rates of women with major depressive disorder are 17.1% (Kessler et al., 1993).

Depression affects at least twice the number of women than men where women are diagnosed with depression more than twice the number of times men are diagnosed with the same disorder (Culbertson, 1997; Sloan & Sandt, 2006). Specifically, depression diagnoses for adult women are at 22.4% when compared to adult men with depression diagnoses of 13.9% (Angst et al., 2002). This difference appears to be relatively consistent across a wide range of cultures, with an average female-to male-ratio of 2:1 (Immerman & Mackey, 2003).

The role of gender appears to play a part in identifying and appraising pain levels. When a male physician identified the cause of a female patient's pain, the physician interpreted the female's pain to be lower than what he would rate the pain of a male patient (Marquie et al., 2003). However, the opposite was true when there was an indistinguishable pain origin. In this situation, a male physician interpreted a female patient to have a higher pain experience than that of a male patient experiencing a similar identified cause for the pain episode (Marquie et al., 2003). Women reported higher pain levels than those reported by Caucasian men (Weisse, Foster, & Fisher, 2005).

Hypothesis 3

A low positive correlation will be found between a physician's rating of depression when assessed by a composite of depression-related items and a patient's rating of depression using the BDI-FastScreen. Physicians who treat patients with pain were asked to appraise each patient's level of depression upon completion of the patient's visit. To understand the physician's appraisals of patient depression, the physician was asked to answer the following questions at the end of the patient visit: *Did the patient appear depressed? Did the patient appear angry? Did the patient present with crying?* Physician responses were given a numeric value 0 for a *NO* response and 1 for a *YES* response. The total score would be combined to total 0-3 points.

Justification. A physician forms opinions about his or her patient with pain by relying on aspects of the patient's personality and the circumstances surrounding the visit (Tait & Chiball, 1997). Prior research has elucidated the often prejudiced responses of physicians to patients' self-reported pain levels. Patients' self-reported pain relief is found to be related to physicians' beliefs regarding pain reduction (Galer et al., 1997). Physicians, then, appear to be the more formidable indicators of postprocedure changes in pain levels (Galer et al., 1997). Physicians may subtly convey pain expectations to patients, thereby suggesting to the patient the perceived pain outcome.

When patients report high levels of pain, high pain intensity, and significant emotional distress, medical personnel tend to disbelieve the patient self-report (Tait & Chiball, 1997). Specifically, the patient's circumstances during a pain episode and the patient's relationship with the physician appear to affect the physician's appraisal of the present pain episode (Tait & Chiball, 1997). These appraisals appear to be similar in a

nonmedical setting also, as this same construct has been demonstrated within a group of nonmedically trained individuals. These individuals tend to disregard a patient's self-reported elevated of pain when individuals report elevated levels of pain. Physicians report more doubt when a patient reports elevated pain levels (Tait & Chiball, 1997).

According to Ani et al. (2008) approximately two thirds of primary-care physicians fail to detect depression. Their study comparing physician ratings of depression and patient ratings of depression found physicians underdiagnosed depression symptomatology (Ani, et al., 2008). In fact, physicians detected only 31% of patients as depressed, though a depression measure more than doubled that number at 75%. Research has shown that, at times, physicians disregard high levels of pain as reported by their patients. At times, physicians often miss a diagnosis of a depressive episode. Taken together, these two concepts could impede the physicians' the accurate assessment of a depressive episode.

Hypothesis 4

Gender will moderate the relationship between depression and pain. At low levels of depression, men and women will not differ in self-reported pain reports, whereas at high levels of depression, women will report significantly more pain than that reported by men.

Justification. Research has been demonstrated that depression can manifest differently within genders. Women endorse symptomatology, such as depressed mood, crying, and guilt (Sloan & Sandt, 2006). Men on the other hand typically report feelings of anger (Sloan & Sandt, 2006). The type and manifestation of depression

symptomatology has been demonstrated to be different between genders. The prevalence of depression between genders is also different.

The lifetime prevalence rates of depression are different for adult men and women. A 1993 review of the National Comorbidity Survey revealed a lifetime prevalence rate of depression at 12% higher for women than men (Kessler et al., 1993). Women tend to have a higher lifetime prevalence rate further indicating increased rates of depression. Women have a 17.1% lifetime prevalence rate of a major depression disorder (Kessler et al., 1993).

Women are diagnosed with depression at more than twice the rate that men are diagnosed with the same disorder (Culbertson, 1997; Sloan & Sandt, 2006). Specifically, depression diagnoses for adult women are at 22.4% when compared to adult men with depression diagnoses of 13.9% (Angst et al., 2002). This difference appears to be relatively consistent across a wide range of cultures, with an average female-to male-ratio of 2:1 (Immerman & Mackey, 2003). Although women receive doses of pain medication lower than those received by men, women experienced increased pain intensity and unpleasantness (Weisse et al., 2005).

Hypothesis 5

A. Single-item, self-rated depression descriptors will be positively correlated with BDI-FastScreen total scores.

B. A linear combination of single-item, self-rated depression descriptors will significantly predict BDI-FastScreen total scores.

Justification. Previous research utilizing the BDI-FastScreen within a group of medical patients has demonstrated positive results. A group of researchers reviewed the

effectiveness of the BDI-FastScreen within a population of HIV-infected patients and found it to be effective in identifying depression symptomatology in this population of HIV-infected individuals who also reported high levels of pain (Krefetz et al., 2004). Using these efficacious results as a foundation, this study is attempting to advance the clinical utility of the BDI-FastScreen. This will be accomplished by further breaking down the seven items of the BDI-FastScreen into descriptors and embedding the descriptors into a different measure. These corresponding one-word descriptors are expected to adequately assess depression. The BDI-FastScreen is designed to include a one-word descriptor followed by a sentence. Each participant is asked to answer a question regarding the magnitude of the depression symptomatology. Questions were scored and ranged in magnitude from 0-3. A score of 0 coincides with no reported symptom interference, a score of 1 denotes minimum symptom interference, a score of 2 denotes moderate symptom interference, and a score of 3 denotes severe symptom interference.

Hypothesis 6

The factor structure of the modified SF-MPQ will comprise one or more pain factors and a distinctive depression factor.

Justification. The self-administered SF-MPQ is used in both the clinical capacity and the research capacity and has an improved clinical utility (Grafton et al., 2005). The SF-MPQ was designed to adequately assess the affective and sensory modalities of pain that the patient is experiencing; however, there is no supportive research substantiating the factor structure (Grafton et al., 2005). There have been however, studies supporting the criterion validity between the original MPQ and the SF-MPQ. Additionally, the SF-

MPQ has demonstrated excellent reliability in the overall score as well as in the specific categories of sensory, affective, and average pain level.

Chapter 4

Overview

The purpose of this study was to determine the factor structure of the BDI-FastScreen and coefficient alpha reliability as this measure relates to a population of patients with pain. Rates of depression are higher in general medical patients with a concomitant high comorbidity of psychological disorders. The reciprocal influences of pain and depression, such as negative emotions and a decrease in activity level, serve to perpetuate aspects of both disorders. The BDI-FastScreen was developed to factor out neurovegetative signs of depression found in a medical population and concentrate on those factors of depression that relate soley to depression. This measure was specifically developed to factor out co-occurring depression symptomatology that may be related to a medical condition (Beck et al., 2000; Steer et al., 1999).

Design and Design Justification

In an attempt to achieve the previously stated goal of identifying a factor structure of the BDI-FastScreen, this study utilized existing data found in a large, multiphysician, multilocation pain-management practice. This retrospective study utilized a sample of individuals living in a large city in Pennsylvania, in the suburbs surrounding that urban setting, and in rural locations as well. The data were collected over a span of 1 month. Initially presented as a project developed to analyze quality of care, data were originally collected to assist in identifying ways to improve quality of patient care by ascertaining the times physicians underdiagnosed depression symptomatology. Although this measure was developed with the intention of being implemented within a diverse medical population, there is a dearth of research supporting the use of the BDI-FastScreen in a

population of patients with pain. Therefore, this design will hopefully lend support to the nature of the factor structure and psychometric properties of the BDI-FastScreen and thereby validate the use of this measure within a population of patients with pain.

Participants

The sample consisted of 328 male and female participants between the ages of 25 and 96 years. There were 112 men and 152 women included in the study. The median age of the participants was 46 years, with a mean age of 57.90 years. The participants reported an average duration of pain symptoms lasting 10.39 months. Most participants did not identify pain as interfering with their daily activities or state that pain awakened them at night (M=1.88, SD=.71). However, all participants were treated through pharmacological means. The participants reported taking over-the-counter pain medications and or a combination of prescribed medications commonly used to treat pain.

The sample was comprised of participants who represented a mixture of culture, gender, and ethnicities. Approximately 73% of the sample was Caucasian. The next largest ethnic group, comprising 2.4 % of the sample, was Hispanic. African Americans, (.9%), and Indians, (.3%) comprised the smallest, however homogeneous groups. A total of 3.7% of the sample participants either chose not to disclose their ethnicity or were unable to provide particular data that could be gleaned from the patient-encounter measure.

According to the U.S. Census, approximately 808,210 individuals were living in 2008 in the Allentown-Bethlehem-Easton area, otherwise known as the Lehigh Valley of Pennsylvania. At the time of the 2008 census, the composition of the Lehigh Valley

revealed that male citizens comprised approximately 394,367 and female citizens comprised approximately 413,843 of the total population. A majority of this population was Caucasians, 87.1%. The remainder of the population was African American; 4.6%; Asian, 2.3%: Hawaiian or Pacific Islander, 0.1%; different race, 4.3%; Hispanic and Latino, 11.3%. The ethnic composition of the sample was similar to the composition of the 2008 reported ethnic composition thereby demonstrating an accurate appraisal of the population.

The sample of the study included both new patients and those who were seen as follow-up patients. The following demographics were coded from the original demographic sheet: age, gender, diagnosis, and onset. This information then was used as a basis of analysis for this present study.

As demonstrated in Table 1, the majority of the sample was comprised of individuals reporting low-back pain or lower extremity pain. A total of 185 individuals reported some type of low-back pain and/or some pain derivative presenting in a lower extremity. The second largest group, a homogeneous group, was comprised of individuals suffering from failed-back-syndrome. Specifically, 65 participants reported having undergone a spinal surgery without receiving pain relief. Forty-nine participants reported upper extremity pain, including neck or arm pain. Eleven participants reported some type of pain derived from an orthopedic injury. Approximately 17 participants reported a different avenue of pain. This group included unspecified flank pain, pain from cerebral palsy, inguinal hernia pain, postthoractomy pain, or testicular pain.

Table 1

Type of Pain Reported by Each Patient and the Corresponding Percentage of the Sample

Location of pain	Number of participants	Percentage
Upper extremity, upper spine	49	14.7
Lower extremity, lower spine	185	51.6
Failed-back syndrome	65	19.8
Orthopedic injury	11	3.3
Other	17	5.1

Note. The type of pain each participant reported.

The demographic sheet contained information including patient gender, level of patient education, type of insurance, past behavioral health and medical history, and description of current pain episode. Data obtained through this demographic packet assisted in further inclusion and exclusion criteria as follows.

Inclusion and Exclusion Criteria

This research study utilized archival retrospective data. At the time of data collection, participants were patients of a pain practice; therefore, each participant presented with varying degrees of persistent pain. Each participant was required to read

English at the sixth-grade level. To be included in the study, participants had to be either new to the pain-management practice or established patients. All patients with chronic pain were diagnosed by one of the physicians in the group practice. Participants with neuropathic pain associated with multiple sclerosis, myofasical pain, amputation, and postspinal surgeries were included in the study, were patients who reported neurological pain episodes, such as back pain, neck pain, and fibromyalgia. Participants with other forms of pain, such as rheumatoid arthritis and migraine were also incorporated into this study.

For the purpose of this study, all patients entering the practice who sought care for pain were included in the study. The requirements to be seen at this pain clinic included an age restriction of 18 years or older, and thus the only exclusion criterion noted was for pediatric or adolescent care (i.e. any person under the age of 18). All new patients entering the practice during the period of data collection were eligible for the study. Current patients being examined for follow-up reasons were also included in the data set.

Recruitment

Data for this research project are archival, and no recruitment was needed for the present analysis to be completed.

Informed Consent

Originally developed as a project analyzing quality of care, data were collected to assist in identifying ways to improve quality of patient care by ascertaining the times physicians underdiagnosed depression symptomatology. By choosing to seek care from one of the pain-management physicians, patients assented to treatment and quality-of-care information was obtained at the outset of their allotted appointment time.

Measures

BDI-FastScreen. The current study used the BDI-Fast Screen to identify the manner in which depression symptomatology scored, within a sample of patients with pain. The original study piloting the BDI-FastScreen elucidated a coefficient alpha of internal consistency at 0.86, thereby demonstrating good reliability (Beck et al., 1997; Beck et al., 2000). When Beck et al. (1997; 2000) compared the BDI--FastScreen with another standardized measure of depression, the BDI-FastScreen was positively related at 0.62, $p< 0.001$, thereby demonstrating notable convergent validity (Beck et al., 1997; Beck et al., 2000). Finally, the BDI-FastScreen was further demonstrated to be a proficient instrument in identifying symptomatology consistent with depression. Therefore, on the basis of internal consistency, convergent validity, and differential diagnosis, the BDI-FastScreen established itself as an effective measure in factoring out neurovegetative signs of depression found in a medical population and in illuminating the depressive symptomatology. Beck et al. (2000) suggested that progressive research utilizing this measure should concentrate on its utility in depression diagnosis within a diverse group of medical patients.

Patient encounter form. This form contains demographic information including age, gender, location of pain, and diagnosis. This form was used also to assess for a range of pain and depression dimensions in each of the participants. Specifically, participants were asked to rate factors associated with pain on a scale of 1-4, 1 being the least amount of interference and 4 being the most amount of interference. Patients were additionally asked to rate their overall pain level on a Likert Scale of 0-10, 0 being no

pain and 10 being the most pain imaginable. Participants were additionally asked to identify if their present pain level interfered with sleep.

Physician Appraisals. Subsequent to performing their examination, physicians were requested to answer the following questions: *Did the patient appear depressed? Did the patient appear anxious? Did the patient express anger?* Physicians provided a yes or no response to each question.

Procedures

To complete this project, permission was obtained from the physician responsible for the original data collection, including originating the initial research question. De-identified data were received from the pain-research team leader for the purpose of completing this study.

When data collection was conducted, each participant was requested to complete a BDI-FastScreen. The completed measure was reviewed and scored by a doctoral-level psychologist. Each participant was additionally requested to complete an encounter form developed by the pain practice. Data analysis for this research study did not produce any risk for the participants. The data collected were archival and no new data were collected to complete the analysis. There was no inherent risk to the participants as this was a retrospective study.

The data set used for this dissertation was originally collected in 2003 in a population of patients with pain. This archival data set asked basic questions pertaining to the comorbid depression symptomatology that one pain-management physician found recognizable. This study was designed to provide physicians with diverse insights about the ability to utilize multiple depression measures to provide treatments for their patients.

The concomitant relationship between depression and pain symptomatology has been well established (Poole et al., 2006;Tennen et al., 2006; Wesley et al., 1999). The benefits of early intervention techniques targeting the depression have also been established (Dysvik et al., 2005). Identifying negative health habits, detrimental behavioral activities, and possible distorted thinking that may accompany both depression and pain symptomatology may facilitate a better prognosis and minimize convalescence time. Therefore, an integrated patient profile targeting depression and pain will enhance diagnostic abilities and afford the patient the benefit of early depression detection. In the context of routine pain-management treatment, if physicians in a multidisciplinary pain practice can promptly and accurately detect and identify patients with a comorbid depression episode, the current pain episode could potentially be minimized. Therefore, the current study did not produce any risk to the participants. However, it will complement existing research on early depression identification within a population of patients with pain.

Maintaining Confidentiality

For the purpose of this research study, there is no access to the original data. The data set provided for the purpose of this study contained de-identified information. The information provided releases only for identifying information such as age and gender. In and of itself, this information does not violate confidentiality, and therefore, there is no possibility of identifying participants and hence, nothing to safeguard. Given the wide demographic location and large number of patients this practice averages, this information would not violate any rules of confidentiality.

Chapter 5

Results

Statistical analyses were conducted to address each hypothesis. Basic data, such as the specific demographic characteristics of the sample, were compiled and will be reported. Information such as mean pain ratings, including the manner in which each participant characterized his or her pain, will be addressed and elucidated. Medications reported by each participant were extracted as well. Owing to the limited research on the BDI-FastScreen within a sample of participants with chronic pain, some initial descriptive statistical analyses were conducted and will be reported. Results pertaining to the internal consistency of the BDI-FastScreen were examined to ensure the reliability of the measure. The factor structure of the BDI-FastScreen as it relates to a population of chronic-pain sufferers was also examined. Gender was investigated as a moderator of depression and pain. Physician identification of depression as compared to self -reported depression symptomatology was also examined. Finally, the factor structure of the modified SF-MPQ was examined.

Demographic characteristics of the sample. The participants with chronic pain identified pain duration from 0-120 months (*m*= 10.39 months; SD = 16.62 months). Of the 328 participants, 222 participants described their pain as a 6 or above on a scale of 1-10. On this scale, a pain score of 1 was equal to the least amount of pain the participant had ever experienced, and a pain score of 10 was equal to the greatest amount of pain the participant had ever experienced. A total of 106 participants rated their pain as a 5 or lower on the same pain scale of 1-10. The mean pain score, as rated by the patients, was 5.5 (*SD* = 2.78). Within this population, the modal pain rating was a 5. Eighteen percent

of the study participants described their pain level as a 5. Seven (7) was the second-most designated pain rating and was chosen by 14.6 % of the participants. The third-most frequently chosen pain rating was an 8, which was rated by 10.1 % of the participants. Slightly more than 67% of the study participants identified a high pain level, thus indicating that more than two thirds of the participants were experiencing significant pain levels. Contrary to the reported high pain levels, most participants did not identify pain as interfering with daily activities or interrupting sleep at night.

All participants did report that they were employing pharmacological treatments to control the pain. The participants reported taking a range of medications to assist with pain assuagement. For example, patients reported taking over-the-counter pain medications such as ibuprofen, naprosyn or acetaminophen to control their pain levels. The participants also reported a wide range of prescription-strength nonsteroidal anti-inflammatory drugs, such as rofecoxib, valdecoxib, tolmetin and diclofenac. The participants also reported taking muscle relaxants, such as metaxalone, baclofen and tizanidine. Steroids, injectable and oral, such as triamcinolone, methylprednisolone, and prednisone types, were reported. Participants additionally reported taking opiod-based medications, such as propoxyphene, hydrocodone, oxycodone, and morphine, as pain relievers. Other pain relievers, such as transdermal patches, benzodiazepines and anticonvulsants, were further categories of pain-controlling medications. Finally, antidepressants, including tricyclics, select serotonin reuptake inhibitors (SSRIs) and serotonin antagonists, were reported as well.

Psychometric characteristics of BDI-FastScreen. The items on the BDI-FastScreen tended to be moderately correlated. As demonstrated in Table 2, the

correlations ranged from .25 to .58. The items most highly correlated were *pessimism* and *loss of pleasure* (*r*=.58). The lowest correlating items were *suicidal thoughts* and *past failure* (*r*=.25). Cronbach's alpha for the BDI-FastScreen, standardized items, was .82. This score suggests that the BDI-FastScreen items, as used within a sample of patients with pain possess a relatively high internal consistency.

Table 2

InterItem Correlation Matrix of the Individual Items of the BDI-FastScreen

BDI-FastScreen Item	Sadness	Pessimism	Past Failure	Loss of Pleasure	Self-Dislike	Self-Critical	Suicidal Thoughts
Pessimism	.561						
Past Failure	.320	.307					
Loss of Pleasure	.447	.575	.329				
Self-Dislike	.499	.416	.420	.473			
Self-Critical	.408	.343	.479	.350	.540		
Suicidal Thoughts	.418	.381	.254	.266	.350	.337	

Note. All were statistically significant

When the patients were asked to rate the intensity of their pain during the past 2 weeks, the most highly rated items, in order of descending intensity, included “aching,” “sharp,” “frustrating,” “non-pleasurable,” and “tiring/exhausting”. Three of the top five descriptors are not physical descriptions of pain. Rather, these top three are categorized as emotional aspects of pain. The overall mean of patient pain descriptors is 19.74. Table 3 lists all the pain descriptors with their individual means and standard deviations.

Table 3

Patient Pain Descriptor Ratings with Means and Standard Deviations in Descending Order of Rated Intensity

Pain Descriptors	N	Mean Rating	Standard Deviation Rating
Aching	328	1.85	1.09
Sharp	328	1.54	1.12
Frustrating	328	1.41	1.16
Nonpleasurable	328	1.40	1.21
Tiring/Exhausting	328	1.37	1.25
Shooting	328	1.29	1.19
Throbbing	328	1.19	1.14
Discouraging	328	1.12	1.15
Stabbing	328	1.12	1.21
Tender	328	1.09	1.15
Gnawing	328	.80	1.08
Hot/Burning	328	.77	1.05
Cramping	328	.75	1.04
Maddening	328	.74	1.032
Sickening	328	.64	.99
Punishing/Cruel	328	.59	1.01

Saddening	328	.54	.92
Fearful	328	.51	.93
Splitting	328	.49	.92
Failure	328	.34	.77
Life-ending	328	.19	.60

Note. Pain descriptors are those found on the encounter form. Patients were asked to rate their present pain experience on a scale of 0-3. A score of 0 was equal to "none", a score of 1 was equal to "mild", a score of 2 was equal to "moderate," and a score of 3 was equal to "severe." Means and standard deviations of the ratings are denoted as well.

Table 4 reports the depression descriptors, as found on the BDI-FastScreen, with the corresponding means and standard deviations. Patients were asked to read various statements and choose a statement which best described him or her. Each question was scored and ranged in magnitude from 0-3. A score of 0 coincided with no reported symptom interference, a score of 1 denoted minimum symptom interference, a score of 2 denoted moderate symptom interference, and a score of 3 denoted severe symptom interference. Means and standard deviations were derived from patient total score of each question.

Table 4

Descriptive Statistics on Items of the Patient BDI-FastScreen

BDI-FastScreen Descriptor	N	Mean Rating	Standard Deviation Rating
Sadness	328	.35	.64
Pessimism	328	.49	.70
Past Failure	328	.21	.54
Loss of Pleasure	328	.77	.81
Self-Dislike	328	.35	.66
Self-Criticalness	328	.34	.63
Suicidal Thoughts	328	.06	.26

Note. Depression descriptors as found on the BDI-FastScreen. Patients were asked to read various statements and choose which statement best described them. Questions were scored and ranged in magnitude from 0-3. A score of 0 coincided with no reported symptom interference, a score of 1 denoted minimum symptom interference, a score of 2 denoted moderate symptom interference, and a score of 3 denoted severe symptom interference.

Factor structure of the BDI-FastScreen. To examine the factor structure of the BDI-FastScreen, a principal components analysis using varimax rotation was conducted. The seven items of the instrument were subjected to an exploratory factor analysis with varimax rotation using Kaiser's criterion of eigenvalues equal to 1 to determine components. The varimax rotation method was used because the depression factors were not expected to be correlated. Using eigenvalues of 1 or higher, results demonstrated that within this sample of patients with paim, only one factor emerged, which accounted for 49.18% of the variance. As elucidated in the Table 5, interpretation of the latent factor suggests a factor most consistent with *dysphoria* within this sample of patients with pain.

Table 5

Principal Components Analysis. Results for the Latent Variable

BDI-FastScreen Items in Patients with Pain	Component 1
Sadness	.757
Pessimism	.741
Past Failure	.619
Loss of Pleasure	.710
Self-Dislike	.765
Self-Criticalness	.705
Suicidal Thoughts	.594

Gender differences in depression. Hypothesis 2 was evaluated by conducting a two-factor ANOVA. A two-factor ANOVA (gender: male vs. female, and pain: (median split of high vs. low self-rated pain level) was performed to test for gender differences in depression, pain level differences in depression, and the interaction of gender and pain on depression. The Levene's test for equality of error variances was not significant, $F(3, 260)=1.279$, $p = .282$). In this sample of patients with pain, women were not more depressed than men. No significant effect was found for gender, $F(1,260) = 3.046$, $p = .08$ but the difference approached significance. For the dichotomized category of depression on the BDI-FastScreen (comparing no depression vs. depression) no significant main effect was observed, $F(1, 260) = 3.673$, $p = .056$; however, the difference once again approached significance. The interaction effect was also nonsignificant, $F(1, 260) = .011$, $p = .917$). Based on a power analysis using a G power method, the observed power for these three analyses was low at .412, .480, and .051 respectively. The ANOVA summary is provided in Table 6. The means for gender categorized by depression level are shown in Table 7.

Table 6

ANOVA Summary

Dependent Variable: Present Pain ANOVA Summary Table

Gender		Mean	Std. Deviation	N
Men	0	5.20	2.70	81
	1	5.87	2.69	31
	Total	5.38	2.69	112
Women	0	5.81	2.80	109
	1	6.56	2.31	43
	Total	6.02	2.68	152
Total	0	5.55	2.76	190
	1	6.27	2.47	74
	Total	5.75	2.70	264

Note. A two factor ANOVA to test for gender differences in depression, pain level differences in depression, and the interaction of gender and pain on depression.

Table 7

Means for Gender Categorized by Depression Level

Source	Type III Sum of Squares	*df*	*MS*	F	Sig	Partial Eta Squared
Corrected Model	53.62	3	17.87	2.50	.061	.028
Intercept	7128.70	1	7128.70	994.41	.000	.793
Gender	21.64	1	21.84	3.05	.082	.012
Bfsdichot	26.33	1	26.33	3.67	.056	.014
Gender X bfsdicot	.078	1	.078	.011	.917	.000
Error	1863.88	260	7.17			
Total	10646.00	264				
Corrected Total	1917.50	263				

Note. A two-factor ANOVA (gender: male vs. female: and pain: (median split of high vs. low self-rated pain level) was performed to test for gender differences in depression, pain level differences in depression, and the interaction of gender and pain on depression. No significant effect was found for gender, the dichotomized category of depression on the

BDI-FastScreen (comparing no depression vs. depression) or the interaction effect; however, the differences approached significance.

Patients' versus physicians' appraisal of depression. Hypothesis 3 was evaluated by conducting a Pearson's correlation to test the association between variables. Results were expected to indicate that a low positive correlation would be found between physicians' ratings of depression, when assessed by a composite of depression-related items, and patients' ratings of depression using the BDI-FastScreen. Physicians were asked to appraise each patient's level of depression upon completion of the patient visit. To understand physicians' appraisals of patient depression, physicians were asked to answer the following questions at the end of each patient visit: *Did the patient appear depressed? Did the patient appear angry? Did the patient present with crying?* Physician responses were given a numeric value of 0 for a *NO* response and 1 for a *YES* response. The score was combined and totaled, resulting in a possible overall total ranging from 0-3 points. Each participant was asked to complete a BDI-FastScreen depression measure. The total score on the patient's completed BDI-FastScreen was the corresponding patient depression rating.

A significant correlation between the physicians' rated depression score and the patients' corresponding self-reported depression scores on the BDI-FastScreen ($r = .349$, $p. < .001$) was found. The coefficient of determination reveals that the physicians' pain composite accounted for 12.18% of the variability in BDI-FastScreen scores.

Gender as a moderator between depression and pain. A 2 (male vs. female) X 3 (level of depression: minimal, mild, and moderate depression) univariate ANOVA was used to test hypothesis 4; that there would be an interaction of gender and level of

participant depression on pain ratings. At low levels of depression, results predicted that men and women would not differ in self-reported pain whereas at high levels of depression, women were expected to report significantly more pain than that reported by men. Levene's test of equality of error variances was not significant, $F(92, 258) = 1.794$, $p = .114$. The ANOVA results demonstrate that the main effect of gender, $F(1, 258) = .430$, $p = .513$ was not significant. However, the effect of level of depression on pain was significant, $F(2, 258) = 5.593$, $p = .004$. Using a post hoc Tukey, patients in group 0 (minimal depression) had significantly lower ratings of pain than those in group 2 (moderate depression), and those in group 1 (mild depression) had significantly lower pain levels than those in group 2 (moderate depression). In addition, the interaction between gender and depression level was not significant $F(2, 258) = .430$, $p = .651$. Table 8 reports the Levene's equality of error variance and Table 9 reports main effect for gender and the effect of level of depression on pain gender.

Table 8

ANOVA Demonstrating Gender as Moderator Between Depression and Pain

Gender	BF	Mean	Std. Deviation	N
Total	0	5.55	2.76	190
	1	5.86	2.46	59
	2	7.87	1.85	15
	Total	5.75	2.70	264

Note. 2 X 3 ANOVA was completed to test the hypothesis that there would be an interaction of gender and level of participant depression on pain ratings. Levene's test of equality of error variances was not significant.

Table 9

ANOVA Demonstrating Gender as Moderator Between Depression and Pain

Source	Type III Sum of Squares	*df*	*MS*	*F*	Sig	Partial Eta Squared
Corrected Model	106.82	5	21.36	3.04	.011	.056
Intercept	4004.02	1	4004.02	570.52	.000	.690
Gender	3.02	1	3.02	.43	.513	.00
Level of depression	78.50	2	39.25	5.59	.004	.042
Gender X Level of depression	6.04	2	3.02	.430	.651	.003
Error	1810.69	258	7.02			
Total	10646.00	264				
Corrected Total	1917.50	263				

Note. The main effect for gender was not significant; however, the effect of level of depression on pain was significant.

Single-item self-rated depression descriptors. A correlation matrix was produced to test hypothesis 5; single-item self-rated, depression descriptors will be positively correlated with BDI-FastScreen total scores. Table10 identifies the full range of correlations.

Table 10

Patient Self-Rated Depression Descriptors in a One-Tailed Distribution

BDI-FS Total	BDI-FS Total	Saddening	Discouraging	Frustrating	Maddening
BDI-FS Total Pearson's	1.00				
Saddening Pearson's	.405**	1.00			
Discouraging Pearson's	.381**	.578**	1.00		
Frustrating Pearson's	.324**	.507**	.671**	1.00	
Maddening Pearson's	.362**	.523**	.630**	.609**	1.00
Life-ending Pearson's	.380**	.412**	.377**	.316**	.482**
Non Pleasurable Pearson's	.313**	.450**	.628**	.618**	.544**
Failure Pearson's	.399**	.400**	.448**	.375**	.471**

	Life-Ending	Non-Pleasurable	Failure
BDI-FS Total			
Pearson's	.380**	.313**	.399**
Saddening			
Pearson's	.412**	.450**	.400**
Discouraging			
Pearson's	.377**	.628**	.448**
Frustrating			
Pearson's	.316**	.618**	.375**
Maddening			
Pearson's	.482**	.544**	.471**
Life-ending			
Pearson's	1.00	.318**	
NonPleasurable			
Pearson's	.318**	1.00	
Failure			
Pearson's	.507**	.396**	1.00

Note. Data were collected on 328 participants and a one tailed test was used to evaluate the correlation between self-rated items and depression descriptors. As demonstrated in the above tables, the manner in which all the patients self-rated the specified depression

descriptors resulted in a significant correlation between the BDI-FastScreen scores and the items on the patient encounter form. All the correlations found were significant at the 0.01 level.

A linear combination of single-item, self-rated depression descriptors as predictors. To further investigate the relationship between self-rated depression descriptors and BDI-FastScreen total scores, multiple regressions analyses were conducted. The overall regression equation was significant, F (7, 320) = 16.267, $p<$ .001). Overall, the self-rated measures of depression were significant indicators of the BDI-FastScreen total scores. A linear regression analysis revealed that three self-rated depression descriptors, *saddening* (b = .60), *life-ending* (b=.78) and *failure* (b = .70), were highly significant predictors of BDI-FastScreen total scores. Overall, the combination of the self-rated descriptors *saddening, life-ending, and failure* significantly predicted the BDI-FastScreen total F (7, 320) = 16.27, p. = .000) and thereby demonstrated that the results found were better than chance. Table 11 provides a summary of the regression coefficients and Table 12 delineates the combination of self-rated descriptors as predictors.

Table 11

Regression Coefficients Demonstrating the Relationship Between Self-Rated Depression Descriptors and BDI-FastScreen Total Scores

Parameter	Sum of Squares	*df*	*MS*	*F*	Sig
Regression	788.49	7	112.64	16.27	.000
Residual	2215.9	320	6.925		
Total	3004.39	327			

Note. Regression Coefficients. The overall regression equation was significant.

Table 12

The Combination of Self-Rated Items as Predictors of BDI-FastScreen Scores

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	*SE*	Beta	*t*	Sig
Constant	1.36	.243		5.57	.000
Saddening	.60	.207	.181	2.87	.004
Discouraging	.241	.202	.091	1.19	.234
Frustrating	.065	.187	.025	.349	.727
Maddening	.065	.208	.022	.315	.753
Life-Ending	.779	.301	.154	2.57	.010
Nonpleasurable	.069	.167	.028	.414	.679
Failure	.701	.237	.177	2.95	.003

Note. The combination of the self-rated descriptors *saddening, life-ending, and failure* significantly predicted the BDI-FastScreen total.

Factor structure of the modified SF-MPQ. The factor structure of the modified SF-MPQ comprised three depression factors and one distinctive pain factor. To examine the factor structure of the modified SF-MPQ a principal components factor analysis using varimax rotation was conducted. The 22 items of the instrument were subjected to an exploratory factor analysis by varimax rotation with Kaiser's criterion of eigen values greater than 1. The examination of the resulting scree plot from the factor analysis suggested a three-factor solution. Item loadings at .40 and above were considered significant. A fourth factor was made up of only one item and was discarded.

Factor 1 consists of *life-ending, fearful, punishing, heavy, splitting, and sickening* and seemed to reveal a latent factor labeled as *Burdensome*. Factor 2, referred to as *Discouragement,* is made up of *frustrating, discouraging, tiring/exhausting, tender, aching and gnawing*. Factor 3, is comprised of *shooting, stabbing, sharp and throbbing*. Factor 3 was referred to as the *Quality of Pain*.

Table 13

Items from the modified SF-MPQ Depicting the Factor Loadings of the 22 Items

	Components			
Descriptor	1	2	3	4
Throbbing	.386	.190	.500	-.175
Saddening	.455	.403	.246	.219
Shooting	.144	.191	.765	.163
Discouraging	.367	.712	.152	.190
Stabbing	.182	.151	.782	.216
Frustrating	.241	.756	.233	.192
Sharp	.100	.247	.775	.055
Maddening	.561	.513	.163	.167
Cramping	.320	.264	.201	.366
Life-ending	.752	.077	.046	.266
Gnawing	.340	.576	.040	.081
Nonpleasurable	.205	.688	.271	.262
Hot/Burning	.162	.229	.303	.558
Failure	.682	.226	.099	.098
Aching	.174	.604	.282	-4.28
Heavy	.535	.299	.363	-.321

Tender	.218	.599	.310	-.073
Splitting	.552	.271	.353	-.025
Tiring/Exhausting	.291	.688	-.176	.003
Sickening	.703	.358	-.163	-.002
Fearful	.738	.318	.133	.027
Punishing/Cruel	.661	.294	.240	.029

Note. Item loadings at .40 and above were considered significant.

Chapter 6

Discussion

Chronic pain is a monumental public health issue. This study proposes that the multidimensionality and physiologic make-up of pain may amplify depression symptoms and may additionally impact the intensity of the pain. Psychological sequelae are often found comorbid with a pain diagnosis and will affect an individual in a physiological, sociocultural, and affective manner. Depression is a specific concomitant condition often found within the population of patients with pain. Depression will exacerbate medical symptoms, thereby negatively affecting social adjustment and future recovery (Clark et al., 1998). In all patients with pain the individual's ability to appropriately function is negatively impacted and disabilities often ensue. Pain-related disability, coupled with medical costs, is estimated to reach about $70 billion dollars annually (Gatchel, 2001). This study identified specific psychometric qualities of the BDI-FastScreen within a population of patients with pain beginning with a proposed factor structure and ending with an integrated model allowing for expedited depression detection. The ease of detecting depression in this medical population within the context of one measure is a benefit. Given the high concomitant relationship between depression and pain, assessing for this disorder is imperative. Depression is often found to be more prevalent in women than in men and further complicates a pain episode. Although the present study did not demonstrate a gender difference, implications of the results focusing on possible explanations will be addressed.

Psychometric characteristics of BDI-FastScreen. To develop the BDI-FastScreen, Beck factor analyzed the BDI-II, the measure from which the BDI-FastScreen was derived (Beck et al., 2000). Beck found that four cognitive components made up one factor of the BDI—II (Beck et al., 2000). To develop the seven items of the BDI-FastScreen, Beck combined DSM-IV-TR diagnostic criteria, a suicidiality criterion and the four cognitive factors derived from the BDI-II (Beck et al., 2000). These seven items made up the internal structure of the BDI-FastScreen. In the present study, results demonstrated the BDI-FastScreen to be comprised of one factor. There has been a paucity of studies validating the factor structure of the BDI-FastScreen. This present study puts forth a proposed factor structure of the BDI-FastScreen within a sample of patients with pain. Although this factor structure may be distinctive to a individuals with chronic pain, differing results may be found in various other medical populations. However, given the small number of items, finding more than one or two reliable factors would be unlikely. Previous research put forth by Beck et al. produced a one-factor structure. Although there were no major differences in the composition of the pilot sample with respect to gender, other researchers have reported gender differences commonly found within depression.

Gender Differences in Depression. Previous research has been documented that women at an increased risk of acquiring depression symptomatology. In addition, depression is the fourth-most prevalent cause of disability in women and the primary cause of disease-related disability (American Psychiatric Association, 2000; Kessler,2003; Lazear, Pires, Isaacs, Chaulk, & Huang, 2008). Women are diagnosed with depression at a rate more than twice that of their male counterparts and demonstrate

lifetime prevalence rates 12% higher than those of men (Culbertson, 1997; Kessler et al., 1993; Sloan & Sandt, 2006). Research has additionally demonstrated that women seek disability compensation 2.5 times more frequently for anxiety or depression-related symptoms than do men (Dewa, Lin, & Paterson, 2002).

The results of the present study indicate that women were not more depressed than men and had overall low depression scores. However, although no significant effect was found for gender or the dichotomized category of depression on the BDI-FastScreen, in both instances the differences did approach significance. Actually, power would have increased if more participants had been in the study and would have possibly supported the hypothesis that women would be more depressed than men. Perhaps, within a sample of patients with pain, the intensity of pain washes out gender differences. As previous research has demonstrated, women typically express pain in emotional terms, whereas men report negative mood symptoms, lending support to the results that approached significance (Affleck et al., 1999). However, prior researchers have found that men and women have similar emotional reactions to pain when pain levels are severe (Unruh, Ritchie, & Merskey, 1999). This research may indicate that the population of patients with pain may be a special population for whom other factors equalize the gender differences. Taking into consideration the observed prevalent gender differences regarding depression symptomatology, this conclusion would be fair.

Patient's Versus Physician's Appraisal of Depression. A significant relationship between the physician's depression score and the patient's corresponding, self-reported depression scores on the BDI-FastScreen was found. As discussed earlier, physicians tend to form opinions of a patient by relying on aspects of the patient's

presenting personality and the circumstances surrounding the visit to the physician (Tait & Chiball, 1997). Physicians tend to report more doubt when their patients report high pain levels and tend to underdiagnose depression when it is present (Ani et al., 2008; Tait & Chiball, 1997). Previous research has indicated that physicians may respond to a patient in accordance with preconceived notions they have developed. Those preconceived notions together with doubting demeanor and underdiagnosis of depression, may impede the detection and intensity of the symptoms. Although a positive correlation was found demonstrating that physicians and patients both report depression, this result does not identify the depression level or intensity of either appraisal. Moreover, only approximately 12% of the variability in physician ratings of depression were attributable to patient appraisal of depression. This corresponding percentage implies that approximately 88% of the variability is attributable to other factors. Perhaps, pain-management physicians are especially versed in identifying depression within their everyday practice; however, they lack the specificity needed to identify significant features more indicative of a moderate or severe depressive episode. As the results indicated, levels of depression may be regarded as indicators of pain intensity and may moderate the relationship.

Gender as a moderator between depression and pain. Patients with minimal depression had significantly lower ratings of pain than those with moderate depression and those with mild depression had significantly lower pain levels than those with moderate depression levels. At low levels of depression, it was predicted that men and women would not differ in self-reported pain reports, whereas at high levels of depression, women were expected to report significantly more pain than that reported by

men. Although the main effect for gender was not significant, results demonstrated that the effect of level of depression on pain was significant. As previous research has confirmed, depression is the most common comorbid condition to chronic pain (Poole et al., 2006; Tennen et al., 2006). Previous suppositions have been that psychological factors have the ability to affect the course and intensity of pain (Turk et al., 1983). It would stand to reason then that in a sample of 328 patients with chronic pain, depression would be a concomminant sequlae of symptoms. Turk et al. (1983) have long postulated that psychological factors may affect an individual's perceptions of pain intensity and overall pain appraisal. As described in the Gate Control Theory of Pain, the pain gate is regulated by thoughts, feelings and behaviors. Thoughts, feelings and behaviors play an integral role in the pain experience (Gatchel, 2005). Melzack's newest pain theory, the Neuromatrix Theory, identifies a unique manner in which brain changes occur. He theorizes that psychological basis of pain is extensive and that many factors, such as genetic factors, situational factors and sensory experiences can influence pain (Melzack, 2005). The pain neuromatrix is the seminal mechanism for identifying and imprinting the sensation of pain as it focuses on all aspects of a pain experience, namely, vestibular, visual and somatosensory sensations (Melzack, 2005). Melzack accounts for individual differences in the establishment and maintenance of pain for each person. Depression, then, may amplify the perception and experience of pain. Given previous theories of the multidimensionality and physiologic make-up of pain, this study confirms the postulate identifying the correlation between the intensity of depression and the reported intensity of pain.

Single-item self-rated depression descriptors. The manner in which all the patients self-rated the specified depression descriptors resulted in a significant correlation between the BDI-FastScreen scores and the items on the patient encounter form. All the correlations found were significant. These significant results confirm the supposition that breaking down the seven items into descriptors and embedding the descriptors into a different measure may adequately assess for depression. These results will serve to increase the physician's efficient use of time by reducing the number of measures administered.

A linear combination of single-item self-rated depression descriptors as predictors. Overall, the self-rated measures of depression were significant indicators of the BDI-FastScreen total scores. Three self-rated depression descriptors, namely, *saddening, life-ending* and *failure,* were highly significant predictors of BDI-FastScreen total scores. Overall, the combination of these three self-rated descriptors significantly predicted the BDI-FastScreen total. The implication of this result is that the linear combination of these three items is a useful indicator of depression. Administering three of the seven items by embedding these items within the pain questionnaire may remove the need for another instrument and increase efficiency.

Factor structure of the modified SF-MPQ. The factors of the modified SF-MPQ accounted for more than 58% of the variance. This result basically extends previous research demonstrating support for this measure. These confirmatory results indicate that the simplicity and uniqueness of this adapted measure and its proficiency in detecting depression in the population with chronic pain provide pain-management physicians and

clinical-health psychologists with a new tool. The ease of detecting depression in this medical population within the context of one measure is a benefit.

Limitations

The present results demonstrate a significant correlation between physician ratings of patient depression and patient self-ratings as endorsed on the BDI-FastScreen. Although the results of the present study demonstrated potentially and clinically useful results, there are some noted limitations to be addressed. These limitations include factors such as antidepressant medication use, the rating scales, the specific type of patients who comprised the sample in this study, and the specialty setting in which the data were gathered.

Medications prescribed to treat chronic pain may have positively affected depressive symptomatology of the patients in the sample. As presented in the demographic section, some of the participants reported taking antidepressant medications. Although typically antidepressant medications, prescribed by a pain management physician are used to assuage neuropathic pain, the potential for the antidepressants to additionally alleviate the depressive symptomatology should not be discounted in the present instance. Usually the antidepressant medications used in this manner are not prescribed at a therapeutic dosage for depression, but they may have added a possible confound in the present study. Future research should be conducted with a sample of patients with chronic pain who are not taking any antidepressant medications.

The directions on the BDI-FastScreen and the encounter sheet requested that the patient answer the presented questions on a four-point scale by circling the most appropriate answer. The directions called for the patient to recall and rate their pain over

the past 2 weeks. Patients may not have been very good historians and their answers may or may not have been consistent with their present mood.

Given the nature of the sample being studied, there is also a possibility that these patients at the time of the appointment may have been experiencing a deficit of coping skills, an extreme amount of pain, or dissatisfaction with the progress of their treatment. Those three factors alone may make completion of the measures difficult. Although depression measures are structured to assess for a depressive episode, the professional must remember to use clinical judgment. Depressive symptoms may be reported particularly within a population of patients with chronic pain; however, these symptoms may be a reaction to a loss of previous functioning or a reaction to the pain itself. Previous researchers have suggested that the development of depression may be initially the result of situational factors (Gatchel & Turk, 1996). However, situational factors may act indirectly on psychological and social factors thereby exacerbating the pain symptoms and cognitive interpretations (Bandura, Taylor, Williams, Mefford, & Barchas, 1985). Keeping in mind, when addressing this population, that pain is multidimensional is of great importance. The pain experience is related not only to the intensity of pain the patient feels that particular day, but also to the patient's personal, internal definition of pain. As with any intrapersonal definition, there is potential for irrelevant information to become a factor in the patient's definition of pain. Awareness, memory, and expectations are three concepts that should be considered, as they contribute to the individual's perception of pain. Potentially, a patient with chronic pain may experience greater hopelessness, pessimism, and despair than a patient without chronic pain.

Environmental aspects must also be considered as well when addressing limitations within this medical population. The location of the testing also must be taken into consideration. The participants were required to complete the measures in a physician's office. The physical location whether a waiting room with other patients around or an exam room which is stark, cold and uncomfortable, may have contributed to the pain level that the patient was experiencing. Additionally, there is the possibility that the participants may not have been completely honest, fearing that honesty could negatively impact their treatment. The self-report measure also may have produced a dishonest answer, especially when taking the BDI-FastScreen because the participants knew that they were taking a depression inventory.

This study included patients who were established patients in the practice. Therefore, the probability that the patients had been previously exposed to and had completed the encounter form is high, as this form is an established measure in this medical practice. This experience may have affected their responses. Additionally, there is a significant chance that the patient had been exposed to and taken the BDI-FastScreen. Thus, there is a possibility that the patients either knew or anticipated what the physicians were looking for when they patients completed the measures.

The final limitation of the present study is a related to sample diversity. The sample used was a sample of convenience: established patients in a pain practice. Most of the sample was comprised of Caucasians patients with pain and, hence, the results may not generalize to patients from large metropolitan areas or ethnically diverse populations. Thus, the findings may be difficult to generalize to the population with chronic pain as a whole. Owing to the breadth of the term, *chronic pain*, the illnesses that were included in

this category encompassed a wide variety of medical diagnoses, such as chronic back pain, arthritis pain, migraine pain, and myofascial pain.

Implications for Practice

The purposes of this study were to extend previous literature on the BDI-FastScreen and to demonstrate a more empirical clinical utility within a sample of patients with pain. Results of this project demonstrated that the BDI-FastScreen can be condensed to one-word descriptors and adequately assess for depression in a population with chronic pain. Instead of utilizing the data from two distinct measures, the adapted patient encounter form, a derivative of the SF-MPQ and the BDI-FastScreen, both clinical disorders can be expeditiously and adequately assessed with only the derivative of the SF-MPQ. Higher rates of depression have been found in populations of general medical patients; therefore, a measure that has been demonstrated to assess for depression in various medical patients has the potential to screen and ultimately reduce depression symptomatology found in medical settings (Clark et al., 1998; Freeman et al., 2010). Coexisting depression symptoms can exacerbate medical symptoms and negatively affect social adjustment and medical and psychological recovery. Therefore, the clinical utility of this measure can enhance the physician's ability to detect depression in various treatment settings.

Primary care may be a medical setting in which these depression predictors may be particularly helpful. As this measure has been demonstrated to detect depression in a population with chronic pain, it may additionally be helpful in detecting depression in a primary-care setting. Given the strong comorbid association of depression and pain symptomatology found in a primary-care setting, this may prove to be an efficacious

assessment measure within this medical setting. The linear combination of the three, one-word descriptors may provide primary-care physicians with an effective assessment tool designed to identify significant pain and depression symptoms.

While it has been established that CBT is a beneficial treatment modality for both depression and pain, this current research provides a measure that can be rapidly administered and easily interpreted to facilitate appropriate treatment planning (Miranda, et al., 2006; Scascighini et al., 2008). The sooner the depression is detected and diagnosed, the quicker CBT or other available treatments can be implemented.

Future Research

Given the present findings results, some possible future directions of this research might include specifying subgroups within the population of patients with chronic pain who share a given diagnosis (e.g., arthritis) and validating this measure within these groups. For example, a population of patients with chronic back pain may demonstrate results that differ from those shown by a population of patients with migraine pain. There are multiple groups with which this type of validation can be achieved. Such potential research may ultimately help to identify differences across diagnostic groups which, in turn, may better inform treatment decisions.

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