ABSTRACT

The Elkins Distress Inventory: Development of a Brief Biopsychosocial Battery for the Assessment of Pain and Psychological Distress in a Chronic Pain Population

Ashley M. Gartner, Psy.D.

Mentor: Gary R. Elkins, Ph.D.

Pain is among the most commonly experienced symptoms for which individuals seek health care and is the cause of significant medical expenditures. For many patients, pain may also lead to psychological distress, sleep disturbances, reduced quality of life, and impaired social relationships. Thus, thorough assessment of pain should encompass physical, as well as emotional, cognitive, and social components of a patient's experience of pain. Such a comprehensive, biopsychosocial approach to the assessment of pain is not typically feasible in medical settings due to the length and format of existing measures of pain and distress. This dissertation examines the convergent and discriminant validity, reliability, factor structure, and clinical utility of the Elkins Distress Inventory as a brief, multidimensional measure of psychological distress in a chronic pain population. A retrospective chart review of 113 chronic pain patients who underwent the standard pre-pain-pump or pre-dorsal-column-stimulator surgery neuropsychological evaluation at the Scott and White Memorial Hospital Division of Neuropsychology was conducted. Correlations between the Elkins Distress Inventory, Battery for Health Improvement-II, Beck Depression Inventory-II, Beck Anxiety Inventory, Beck

Hopelessness Scale, and State-Trait Anger Expression Inventory-II were calculated in order to examine the convergent and discriminant validity of the Elkins Distress Inventory and its subscales. Additionally, the internal consistency of the Elkins Distress Inventory and its subscales was calculated. Exploratory and confirmatory factor analysis procedures were also conducted. The results of these analyses support the convergent and discriminatory of the Elkins Distress Inventory. The internal consistency and four-factor structure of the Elkins Distress Inventory were also supported by these analyses. Based on these results, the Elkins Distress Inventory appears to be a valid, reliable, and clinically useful tool to measure of psychological distress in a chronic pain population. Further, the Elkins Distress Inventory may be useful for the assessment of psychological distress associated with other medical conditions and appears to meet a clinical need for a brief, multidimensional measure of psychological distress in medical settings, thereby enhancing the assessment and treatment of psychological and physical symptoms of patients with medical conditions.

The Elkins Distress Inventory: Development of a Brief Biopsychosocial Battery for the Assessment of Pain and Psychological Distress in a Chronic Pain Population

by

Ashley M. Gartner, Psy.D.

A Dissertation

Approved by the Department of Psychology and Neuroscience

_____
Jaime L. Diaz-Granados, Ph.D., Chairperson

Submitted to the Graduate Faculty of
Baylor University in Partial Fulfillment of the
Requirements for the Degree
of
Doctor of Psychology

Approved by the Dissertation Committee

_____
Gary R. Elkins, Ph.D., Chairperson

_____
Helen E. Benedict, Ph.D.

_____
Keith Sanford, Ph.D.

_____
Sara L. Dolan, Ph.D.

_____
Rafer S. Lutz, Ph.D.

Accepted by the Graduate School
August 2011

_____
J. Larry Lyon, Ph.D., Dean

Page bearing signatures is kept on file in the Graduate School.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

BAI	Beck Anxiety Inventory
BDI-II	Beck Depression Inventory, Second Edition
BHS	Beck Hopelessness Scale
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
EDI	Elkins Distress Inventory
NRS	Numerical Rating Scale
STAXI-II	State-Trait Anger Expression Inventory, Second Edition
VAS	Visual Analog Scale

ACKNOWLEDGMENTS

The author of this dissertation wishes to acknowledge Dr. Gary Elkins, who is the developer of the Elkins Distress Inventory, for his guidance throughout this process. Additionally, this author would like to acknowledge Dr. Jacqueline Phillips-Sabol, for allowing this author to collect data at the Scott and White Memorial Hospital Division of Neuropsychology, and for her support of this project. Acknowledgment also goes to Lori Whisler, M.S., Dr. Gregory Westhafer, Dr. Daniel Cruz-Laureano, Dr. Stephanie Levy, and the rest of the team at the Scott and White Memorial Hospital Division of Neuropsychology for their feedback and assistance with data collection. This author also wishes to acknowledge the Baylor University Mind-Body Medicine Research Laboratory team for their support and feedback.

DEDICATION

To my Lord and Savior Jesus Christ, who gives purpose to this work and is the One who made it possible. To my wonderful family for their constant love and support.

CHAPTER ONE

Introduction

Prevalence of Pain and Associated Costs

Pain is among the most commonly experienced symptoms for which individuals seek health care (Waddell & Turk, 2001). Epidemiological surveys indicate that between 50% and 70% of people experience back pain at some point during their lives (Andersson, Pope, & Frymoyer, 1984). Among those experiencing pain, 14% reported experiencing back pain persisting for more than two weeks (Deyo & Tsui-Wu, 1987) and 18%-22% identified the intensity of their pain as severe to excruciating (Frymoyer, Pope, Costanza, Rosen, Goggin, & Wilder, 1980; Nagi, Riley, & Newby, 1973).

Pain is the source of significant personal and financial costs. An estimated 11.7 million Americans suffer from significant impairment related to pain (Holbrook, Grazier, Kelsey, & Staufer, 1984). Among those individuals, 2.6 million are permanently disabled and another 2.6 million are temporarily disabled at any given time (National Center for Health Statistics, 1981). Waddell (1998) estimates that pain associated with spinal disorders in the United States costs $33 billion annually in medical expenditures.

Consistent with a biopsychosocial approach to medical treatment, pain impacts those who suffer from it not only physically, but emotionally and socially as well. In addition to the financial costs associated with chronic pain, patients suffering from chronic pain commonly experience significant psychological distress. Comorbid pain and psychological distress additively increase medical costs, as mean per-person annual medical expenditures for individuals suffering from both chronic disabling pain and

major depressive disorder exceed $8,000, an amount higher than expenditures for individuals suffering from only pain or major depression alone (Arnow, Blasey, Lee, Fireman, Hunkeler, & Dea, 2009). Research also suggests that negative affective states stemming from acute or chronic pain may persist even after the physical pain symptoms ameliorate (Hummel, Lu, Cummons, & Whiteside, 2008).

Beyond being linked to medical expenditures and comorbid psychological distress, chronic pain frequently leads to decreased mobility and inability to work, substantially diminishing income and overall quality-of-life for many patients. Research has demonstrated that chronic pain can alter patients' sleep patterns, which can create sleep disturbances that translate into fatigue, interference with daily activities, increased depression and anxiety, and impairment in relationships (Miaskowski, 2009). Further, neuropathic pain has been shown to reduce both quantity and quality of patients' personal relationships (Closs, Staples, Reid, Bennett, & Briggs, 2009). Kalichman (2009) asserts that chronic pain associated with fibromyalgia may lead to decreased sexual desire and arousal, diminished experience of orgasm, and increased discomfort during intercourse. Moreover, the spouses and caregivers of chronic pain patients suffer pain-related consequences as well in the form of their own inability to work, stress associated with caregiving responsibilities, and, in many cases, marital conflict (O'Conner, 2009). While it is difficult to estimate total costs associated with pain, sickness absence, social security and compensation, there is clearly a great deal of suffering related to chronic pain on both a societal and personal level (Waddell & Turk, 2001).

Toward a Biopsychosocial Model of Assessment and Treatment

In addition to being associated with significant societal costs and personal suffering, chronic pain has been shown to negatively influence one's affect and psychological well-being. Numerous researchers have asserted that affective states and physical well-being are strongly related (Linden, Stossel, & Maurice, 1996; Miller, Druss, Dombrowski, & Rosenheck, 2003). Consequently, physical illness can negatively impact one's psychological well-being, and likewise, psychological distress can negatively influence one's physical condition, including one's immune functioning and the severity of a variety of medical conditions, such as Type II Diabetes (Pan, Lucas, et al., 2010) and coronary artery disease (Kiecolt-Glaser, Robles, & Glaser, 2002; Krantz, Sheps, Carney, & Natelson, 2000; Rapp, Parisi, & Walsh, 1988). Further elucidating the link between psychological and physical well-being, researchers have found that 75% of all visits to primary care physicians involve distress without a true medical basis or distress as the result of an aggravation of physical symptoms by psychological factors (Cummings, 1997, 2001; Speer & Schneider, 2003).

Waddell and Turk (2001) assert that a patient's experience of pain is neither an exclusively physical phenomenon nor an exclusively psychological phenomenon, but rather a manifestation of the interrelationship between biological, medical, psychological, and social factors. A patient's beliefs about his or her pain, including the tendency to catastrophize the pain, ruminate on the pain, or to view one's pain as helpless, influence the affect associated with the pain, which in turn impacts the degree of disability and behavioral change resulting from the pain. Thus, Waddell and Turk (2001) posit a biopsychosocial approach to the assessment of pain, which encompasses the cognitive,

affective, and behavioral components of a patient's experience of pain. Waddell and Turk's (2001) biopsychosocial model for the assessment of pain includes evaluation of the patient's physical pain symptoms, the patient's attitudes and beliefs about his or her pain, psychological distress related to the pain, illness behavior and disability resulting from the pain, as well as the patient's social environment.

Due to the strong connection between physical symptoms, including chronic pain, attitudes and beliefs about these symptoms, and psychological distress, a comprehensive, biopsychosocial approach to medical treatment should include psychological assessment and intervention. Previous research shows that up to 93% of primary care clinicians report that an integrated treatment model incorporating mental health interventions into medical care led to enhanced communication between physicians and mental health specialists and less stigmatization of mental health symptoms, while 92% stated that increased coordination of care for physical and psychological symptoms resulted. Eighty-eight percent of primary care physicians reported that integrating mental health assessment and interventions into medical care improved health education. A majority of primary care clinicians reported that integrating behavioral health into primary care fostered more effective treatment of depression (64%), anxiety (76%), and alcohol problems (66%) among primary care patients (Gallo, Zubritsky, et al., 2004). Moreover, Miranda, Schoenbaum, and Sherbourne (2004) found that integrating evidence-based treatment for depression is more effective in reducing depressive symptoms than primary care alone for depressed individuals. Studies have also shown that an integrated, collaborative model of treatment is more effective than primary care alone in treating

bipolar disorder (Simon, Lundman, et al., 2005) and panic disorder (Roy-Byrne, Katon, Cowley, et al., 2001).

An important practical benefit of assessing and treating psychological distress in medical settings is reduction in medical expenditures and length of hospital stays. A meta-analysis by Chiles, Lambert, and Hatch (1999) demonstrated that, in 90% of studies, psychological intervention resulted in decreased use of medical services. This meta-analysis further revealed that psychological intervention reduced hospital stay length by an average of 2.5 days, corresponding to a per-person savings of $2,205.

In addition to the financial benefits of integrating psychological interventions into care in medical settings, this can lead to increased access to care, as well as improved quality of care, treatment outcomes, and treatment compliance (Kutcher, Leblanc, Maclaren, & Hadrava, 2001; Levant, 2004; Wachter, 2003). Further, the integration of psychological interventions into primary care enables medical professionals to treat not only the physical components of patients' symptoms, but the emotional and social factors as well. However, in order for these benefits to be realized in medical settings, physicians and clinicians must have a brief, valid means of screening for and assessing psychological distress among patients that can feasibly be applied in medical settings.

Prevalence of Psychological Distress in Medical Settings

Consistent with Waddell and Turk's (2001) biopsychosocial model for the assessment of pain, which asserts the interrelationship between physical symptoms and associated cognitions and affect, psychological distress is prevalent in a variety of medical settings, and among individuals with a variety of medical concerns. Distress may include a sense of increased vulnerability, worry, fear about the future, concern

about one's illness, sadness, anger, feelings of powerlessness, poor sleep, and decreased appetite (Vitek, Rosenzweig, & Stollings, 2007). The incidence of depression in palliative care patients is believed to be about 25% (Lees & Lloyd-Williams, 1999). In a sample of women with breast cancer, anxiety was identified in 49.6% of patients, and depression was identified in 37.2% of patients (Hall, Hern, & Fallowfield, 1999). In secondary health care clinics, 25% of patients were distressed (Feldman, Rabinowitz, & Ben Yehuda, 1995). Furthermore, existing distress is often exacerbated by patients' awareness of the advancement of their disease, limited effectiveness of treatment, and in some cases, shortened life expectancy (Roth & Massie, 2007).

Specific to pain patients, distress has been reported in between 15% to 41% of individuals with chronic lower back pain (Preuper, Reneman, Boonstra, Dijkstra, Versteegen, & Geertzen, 2007). Additionally, serious psychological distress was found in 5.6% of arthritis patients, while 26.2% of those in this sample exhibited frequent anxiety and depressive symptoms. These frequencies were both significantly higher than those found among non-arthritic individuals (Shih, Hootman, Strine, Chapman, & Brady, 2006). Other researchers have found the prevalence rate of Major Depressive Disorder to be 9.3 % among individuals with abdominal or chest pain, 7.9 % among arm or leg pain patients, and 6.2 % among those suffering from back pain (Baune, Caniato, Garcia-Alcaraz, & Berger, 2008).

Waddell & Turk (2001) propose a biopsychosocial model of chronic pain and disability, which posits that underlying psychological distress and associated attitudes and cognitions, as well as affective and behavioral disturbances, should be assessed in addition to pain patients' physical symptoms. Among individuals with acute pain,

anxiety is likely the most significant psychological disturbance, whereas depression is the most relevant among chronic pain patients (Sternbach, 1977). Increased bodily awareness, as measured by the Modified Somatic Perception Questionnaire, appears to be related to distress among patients (Waddell & Turk, 2001).

Furthermore, the beliefs, appraisals, and expectations held by patients about their pain, ability to cope, and social support systems significantly influence their investment in treatment, treatment adherence, and perceptions of disability, as well as the manner in which patients present their symptoms to others. Low sense of self-efficacy, or a patient's belief that he or she lacks adequate resources to cope with pain, as well as the belief that one's pain is uncontrollable, have been shown to have a direct negative impact on mood and functioning. The thoughts of pain patients are often characterized by cognitive errors and distortions, such as "My case is hopeless, "I'll never get any better," and "I can't do anything I used to." (Waddell & Turk, 2001). Such cognitive errors have been linked to depression and heightened pain severity (Gil, Williams, Keefe, & Beckham, 1990), as well as greater pain-related disability (Smith, Follick, Ahern, & Adams, 1986). Moreover, pain patients may avoid activities, such as work and exercise, and may engage in complaining and help-seeking behavior in order to reduce physical and psychological symptoms of pain. These behaviors may be reinforced by financial compensation and attention received from relatives, increasing the likelihood that these behaviors will persist and putting the patient at risk of exacerbation of pain symptoms and greater pain-related disability (Waddell & Turk, 2001).

Underreporting of Distress Symptoms and Risks of Leaving these Symptoms Undetected and Untreated

Despite the high prevalence of psychological distress among pain patients and individuals in other medical settings, these symptoms are often undetected and underreported. Because of the lack of a brief, reliable, valid method of assessing distress, physicians must often rely on patients to report these symptoms. However, many patients underreport psychiatric and psychological symptoms, not wanting to burden doctors (Lees & Lloyd-Williams, 1999). In fact, only 5% of patients experiencing significant distress actually reported their distress to their healthcare providers in a study conducted by Vitek, Rosenzweig, and Stollings (2007). Also, research has shown that primary care physicians underdiagnosed depression in 35.7% of patients (Bufka, Crawford, & Levitt, 2002). Of further concern, oncologists identified only 36% of cancer patients who were experiencing distress, underestimating the prevalence and severity of distress among these patients (Sollner et al., 2001).

Untreated psychological distress should be a serious concern of physicians and clinicians, as this has been shown to lead to difficulty with physical symptom control, social withdrawal, reduced quality of life, and greater likelihood of dying. Distress negatively impacts decision making, treatment compliance, and treatment outcomes (Vitek, Rosenzweig, & Stollings, 2007). Previous studies have found strong associations between mental disorders and the use of inpatient admissions and primary care resources (Hansen, Fink, Frydenberg, de Jonge, & Ruyse, 2001). Additionally, anxiety, depression, and psychological distress have been found to result in increased average length of stay for hospital inpatients when untreated (Verbosky, Franco, & Zrull, 1993). Among female inpatients in medical hospitals, the presence of a mental disorder has been associated with

use of a higher number of non-psychotropic medications (Hansen, Fink, Frydenberg, de Jonge, & Huyse, 2001). Specific to pain populations, distress may be related to greater pain-related disability among chronic lower back pain patients (Preuper, Reneman, Boonstra, Dijkstra, Versteegen, & Geertzen, 2007). Furthermore, stroke patients who were depressed regained less functioning than those who were non-depressed (Lees & Lloyd-Williams, 1999). Among Crohn's disease patients, anxiety, depression, and hopelessness have been shown to be associated with heightened disease activity and exacerbation of symptoms (Mardini, Kip, & Wilson, 2004). Psychological distress may also result in ineffective communication between patients and physicians, as cancer patients who had high scores on the Hospital Anxiety and Depression Scale reported insufficient understanding of information related to their disease and treatment and dissatisfaction with the information provided by their physicians (Montgomery, C., Lydon, A., & Lloyd, K., 1999). Thus, psychological distress may limit a patient's ability to provide informed consent to treatment, raising ethical concerns about providing medical treatment without addressing psychological distress.

As previously discussed, untreated psychological distress is likely to lead to significant medical expenditures. Relative to patients with treated mental illness, patients with untreated mental illness had 41% higher utilization of nonpsychiatric services and 21% higher number of nonpsychiatric medical visits (Bufka, Crawford, & Levitt, 2002). Therefore, assessing and treating psychological distress in pain patients is vital, and is likely to lead to more effective, comprehensive treatment, as well as a reduction in unnecessary medical expenditures. Further elucidating the importance of assessing and

treating psychological distress, untreated psychological distress increases patients' risk of suicidality, as has been shown in cancer patients (Filiberti & Ripamonti, 2002).

Because of the prevalence of psychological distress among pain patients, as well as the exacerbation of symptoms and increased medical expenditures that result from underreporting of psychological distress, assessment of pain patients should be conducted in a manner consistent with Waddell and Turk's (2001) biopsychosocial model and should include evaluation of the patient's physical pain symptoms, pain-related attitudes and beliefs, psychological distress, illness behavior, and social environment.

Current Methods of Assessing Pain Intensity, Affect, Quality, and Location

Because pain is not directly observable, it must be inferred from behavioral observations or assessed using self-report measures. Because of the dynamic, multifaceted nature of the pain construct, it cannot be adequately assessed in a unidimensional manner. Rather, thorough pain assessment should measure four aspects of the pain experience: pain intensity, pain affect, pain quality, and pain location (Jensen & Karoly, 2001). Current methods of assessing pain intensity and pain affect will be discussed. Pain quality and pain location are beyond the scope of this study.

Pain intensity refers to how much or how severely a person hurts. Information about intensity can often be obtained by a quick, quantitative estimate provided by the patient (Jensen & Karoly, 2001). Pain intensity fluctuates at various points during the day, tending to increase over the course of the day with peaks at noon and 6:00 p.m. (Folkard, Glynn, & Lloyd, 1976). In order to reduce the influence of time of day and other contextual variables, patients should rate their pain at the same time of day and in the same location. Alternatively, clinicians may choose to aggregate multiple measures

when assessing pain intensity (Jensen & Karoly, 2001). Verbal rating scales (VRSs), visual analog scales (VASs), and numerical rating scales (NRSs) are the three most commonly used methods of assessing pain intensity. A VRS measures involves a list of adjectives describing various gradations of pain intensity. The adjectives are typically organized in order of pain severity, which a score being assigned based upon the adjective's rank along the continuum of severity. VRS measures can include a range of numbers of adjectives. For instance, a 4-point VRS scale might include adjectives ranging from "no pain" to "severe," while a 15-point scale might exhibit a scope from "extremely weak" to "extremely intense." VRS measures are often criticized for assuming equal intervals between adjectives, which is unlikely to be the case. Thus, assessing the magnitude of changes in pain intensity is difficult using VRS measures. Moreover, VRS measures necessitate that patients read over and are familiar with the entire list of adjectives prior to responding, which can be difficult and time-consuming when longer lists are employed. Further, due to this limitation, illiterate patients will likely be unable to provide a reliable, valid estimate of their pain intensity (Ferraz, Quaresma, Aquino, Attra, Tugwell, & Goldsmith, 1990). Even for patients who are able to read and comprehend all of the adjectives listed, patients may not be able to find an adjective that accurately describes their perceived pain intensity from the finite number of descriptors provided (Joyce, Zutshi, Hrubes, & Mason, 1975). However, VRS measures are easy to administer and score, and typically have high compliance rates (Jensen & Karoly, 2001). They have also consistently demonstrated convergent validity and sensitivity to treatment effects (Jensen & Karoly, 2001).

Visual analog scales are also frequently utilized to assess pain intensity. VAS measures consist of a 10 cm long line, with the ends labeled as extremes of pain intensity, such as "no pain" to "pain as bad as it could be." Specific points along the line may be labeled with adjectives or numbers denoting various degrees of pain intensity. The validity of VAS measures of pain intensity has been widely supported, as such measures correlate to other self-report measures of pain intensity and observed pain-related behavior. VAS measures have also been shown to be more sensitive than other measures to treatment effects and change over time. VAS responses are typically measured and scored in millimeters, resulting in a large number of response categories and heightened sensitivity. Another advantage of VAS measures is that such scales have ratio attributes, meaning that differences in VAS pain intensity scores represent actual differences in magnitude of pain intensity. A potential drawback to VAS measures is that some patients, particularly those with cognitive deficiencies, may require explanation of the scale in order to understand how to complete it. For such patients, numerical rating scales, in which numbers are placed along to the line to represent various degrees of pain intensity, may be easier to understand and less cognitively demanding (Jensen & Karoly, 2001). For illiterate patients and pediatric populations, picture or face scales are recommended for assessing pain intensity. These scales involve selecting a facial expression from a group of facial pictures that best represents one's pain intensity. The validity of picture scales has been consistently demonstrated (Jensen & Karoly, 2001).

An alternative means of assessing pain intensity is the Descriptor Differential Scale of Pain Intensity, or DDS-I. On this scale, patients are presented with a list of adjectives corresponding to various degrees of pain intensity and are asked to rate their

pain as more or less intense than each adjective. The DDS-I has been shown to have excellent internal consistency and sensitivity. However, it is much more complex than other measures of pain intensity, and is therefore not recommended for use with populations at risk for cognitive difficulties. Further, it is generally more time-consuming to complete than other measures (Jensen & Karoly, 2001).

Pain affect refers to the degree of emotional arousal and/or emotional changes elicited by the experience of pain, as well as the mental state resulting from the appraisal of one's pain and pain-related threats. One's experience of pain emerges not only from physical aspects of one's pain condition, but also from the interplay of pain-related thoughts and emotions. Thus, particularly in the case of chronic pain patients, emotional aspects of pain significantly influence patients' clinical pictures (Jensen & Karoly, 2001). Pain affect is most commonly assessed via the Affective subscale of the McGill Pain Questionnaire (MPQ), for which reliability and validity have been demonstrated (Melzack, 1975). The Affective subscale of the Pain-O-Meter (POM) offers a brief alternative to the McGill Pain Questionnaire, although research suggests the the POM is less reliable and valid than the MPQ (Jensen & Karoly, 2001).

Although verbal rating scales (VRSs) are also employed to assess pain affect, these scales may not adequately measures pain affect as a construct distinct from pain intensity (Jensen & Karoly, 2001). Evidence supports the validity and sensitivity of VAS measures of pain affect. However, notably, literature related to VAS measures of pain affect focuses almost exclusively on single-item VAS measures which assess pain affect as a global dimension. To date, no multiple-dimension measure, VAS or otherwise, has been developed to assess pain affect (Jensen & Karoly, 2001). Given the evidence for the

validity and sensitivity of VAS measures and the lack of a multi-component measure of pain affect, the development of a multi-dimensional VAS measure of pain and pain affect is an area of needed research.

Current Methods of Assessing Distress

Currently, self-report questionnaires are the primary means of assessing psychological distress. The Beck Depression Inventory-II (Beck, Steer, & Brown, 1996), a 21-item self-report questionnaire that takes 5-10 minutes to complete, is widely regarded as the gold standard for the assessment of depression. This measure was designed to be consistent with DSM-IV criteria for Major Depressive Disorder (Beck, Steer, & Brown, 1996). The convergent validity of the BDI-II has been demonstrated, as it has strong correlations with other depression rating scales, as well as measures of suicidality and hopelessness (Krefetz, Steer, Gulab, & Beck, 2002; Osman, Kopper, Barrios, Gutierrez, & Bagge, 2004). The Center for Epidemiological Studies Depression Scale (CES-D) was developed to identify depression in the general community. It contains 20 items rated on a 4-point Likert scale, and involve rating the frequency of depressive symptoms. Although the CES-D has good reliability and validity, it has been shown to overestimate the prevalence of depression (Dozois & Dobson, 2002). The Hospital Anxiety and Depression Scale, or HADS, which is a 14-item self-report instrument consisting of a depression subscale as well as an anxiety subscale, is the most commonly used measure of distress in palliative care and other medical settings (Lees & Lloyd-Williams, 1999). The HADS demonstrated good internal consistency and content validity (Woolrich, Kennedy, & Tasiemski, 2006).

Symptom checklists, which vary in terms of length and content, are also employed to screen for specific distress symptoms (Derogatis, 2000). One such checklist, the Symptom Checklist-90-Revised, or SCL-90-R, is self-administered by the patient, includes 90 items, and can be completed in 15-20 minutes. The SCL-90-R contains a Global Severity Index measuring distress, as well as a frequency count of the number of symptoms reported, and a Positive Symptom Distress Index reflecting the intensity of distress. The reliability and validity of the SCL-90-R have been well-documented (Bufka, Crawford, & Levitt, 2002). The Brief Symptom Inventory, or BSI, contains 53 items and was designed to be a brief version of the SCL-90-R, as it can be completed in as little as 10 minutes. Items are rated using a 5-point Likert scale. Although the BSI is not intended to be a diagnostic tool, it is useful as a general measure of psychopathology and distress. As with the SCL-90-R, the BSI has been shown to be reliable and valid (Bufka, Crawford, & Levitt, 2002).

Additionally, clinician-administered interviews, such as the Structured Clinical Interview for DSM-IV (SCID-I) may be employed in order to assess symptoms of distress (Aben, Lousberg, & Honig, 2002). The SCID-I is a semistructured interview designed to cover a variety of DSM-IV diagnoses, as well as provide an overview of patients' presenting complaints and background information. It typically takes 45-90 minutes to administer. Interrater reliability estimates for the SCID-I are moderate to excellent (Dozois & Dobson, 2002). Interviews may be fully structured, semistructured, or interviewer-based. Structured interviews involve a standardized set of probes that are intended to examine symptoms and features, duration of symptoms, and past history, making them useful for differential diagnosis (Rogers, 2003). Due to their greater

flexibility relative to structured interviews, semistructured interviews may yield greater validity and accuracy of diagnoses (Kessler, Avenevoli, & Merikangas, 2001).

Clinician rating instruments can also be means of assessing distress. The Hamilton Rating Scale for Depression (HRSD) is the most commonly used clinician-rating instrument and is useful for assessing behavioral and somatic symptoms of depression. The HRSD has been deemed to be reliable and sensitive to change. Inter-rater reliability ratings are .84 and greater, and correlations between the HRSD and other measures of depressive symptomatology are between .60 and .98 (Dozois & Dobson, 2002).

Moreover, broad personality assessment instruments, such as the Personality Assessment Inventory and The Minnesota Multiphasic Personality Inventory-II, have scales designed to measure distress, including depression and anxiety, as well as other forms of psychopathology. These instruments are widely used and have good psychometric properties, but are time-consuming to complete, and therefore, impractical for use in medical settings.

Although self-report questionnaires and clinician-rating scales are available for the assessment of psychological distress, these measures may not be feasible for use in many medical settings due to the time required to complete them. Further, the majority of these measures focus on only one aspect of affective distress, such as depression or anxiety, rather than assessing multiple forms of psychological distress in a single instrument. Thus, in order for the biopsychosocial model of assessment to be feasibly applied in medical settings, a comprehensive, yet brief, measure of psychological distress is needed.

Impediments to the Biopsychosocial Model of Assessment Using Existing Methods

Despite the importance of assessing the cognitive and affective components of an individual's experience of physical symptoms, such as pain, significant limitations are evident in existing measures of distress when used in medical settings. A primary limitation is that administration of traditional psychological assessment instruments may be invalid and impractical for patients with cognitive impairments. Language and reading skills affect patients' ability to complete self-report questionnaires and interview-format assessment tools (Lees & Lloyd-Williams, 1999). Therefore, these types of assessment may be inappropriate for individuals who have cognitive deficits due to dementia, stroke, other medical conditions, or medical treatments. For example, stroke survivors often have severe communications difficulties, making self-report questionnaires inappropriate for use with such individuals (Vickery, 2006). In fact, in a sample of stroke patients, 12.9% of patients were unable to validly complete a single self-report measure of distress (Aben, Lousberg, & Honig, 2002). Consideration of the cognitive and physical limitations of patients is a vital component of assessment of distress in medical settings (Radbruch, et al., 2000). Furthermore, the length of many existing measures of psychological distress makes the assessment of distress time-consuming, and in many settings, impractical. Many patients may be too fatigued or weak to complete lengthy questionnaires, which are physically and mentally taxing (Lees & Lloyd-Williams, 1999; Vickery, 2006). Likewise, the time required to train professionals to administer interview-format assessment instruments may make this type of assessment time and cost-prohibitive (Kessler, Avenevoli, & Merikangas, 2001). Even once professionals are trained to administer such measures, the time required for

administration renders this impractical in many medical settings. Of further concern, in the era of managed care, is that it is increasingly difficult to receive reimbursement for time-intensive assessment services, which may be viewed as discretionary, rather than necessary services. However, there is increasing empirical support that assessment of distress improves the quality of care provided to patients (Belar, 1997). This may facilitate reimbursement for such services.

Also of concern is that a number of assessment tools focus primarily on somatic symptoms of distress, which could be related to pain or physical illness rather than psychological distress. For this reason, the Hospital Anxiety and Depression Scale relies on symptoms of anhedonia rather than somatic symptoms (Lees & Lloyd-Williams, 1999). According to recent studies involving patients with rheumatoid arthritis, self-report questionnaires for depression might be affected and contaminated by the inclusion of items reflecting disease severity, thus reducing the validity of such measures of distress for certain patients (Tamiya, Araki, & Ohi, 2002). Self-report questionnaires intended to measure distress alone are likely to in reality reflect both distress and symptoms directly related to the respondent's medical conditions, such as pain. Further, it is often difficult to distinguish symptoms of distress from physical symptoms of a patient's medical condition, or from normative end-of-life sadness in individuals who are terminally ill (Shacham & Daut, 1981).

Moreover, self-report measures may lack adequate sensitivity to detect psychological distress in many patients. In a study of women with early-stage breast cancer, the Hospital Anxiety and Depression scale demonstrated low sensitivity of 24.2% and 14.1%, respectively, for the anxiety and depression subscales when the standard cut-

off point of 11 was used (Hall, Hern, and Fallowfield, 1999). Due to this low sensitivity, the psychological distress of many patients may go undetected. While lowering the cut-off points can increase sensitivity, this approach can also result in false positives and unnecessary expenditures of time and resources (Hall, Hern, and Fallowfield, 1999).

Practical issues involved in consultations between psychological practitioners and physicians in medical settings can also hinder the assessment of psychological distress. Physicians are often unsure of what services clinical psychologists are able to provide. Further, consultation requests from physicians are often ambiguous and provide insufficient information. Additionally, standard protocol, or specific referral sources, may require the use of specific assessment instruments that do not provide sufficient information about psychological distress experienced by the client, which can lead to conflict between psychologists and physicians. Also of concern, many patients in medical settings may be unable to actively participate in the assessment process, such as those who have recently experienced major medical trauma, are comatose, or who are under the influence of anesthesia. In addition to being unable to actively participate in the assessment process, such individuals are likely to be unable to provide informed consent, and may be unable to provide relevant background information, further hindering the assessment process. Inaccurate or incomplete background information can lead to erroneous conclusions. Privacy is also a complicating factor when conducting psychological assessment in medical settings. Many patients do not have private rooms, making it difficult, if not impossible, to maintain complete privacy and confidentiality during the assessment. It is also very challenging to schedule assessments, particularly those that are lengthy, as medication regimens and other treatment procedures must take

precedence over psychological assessment. Even when assessments are scheduled, frequent interruptions, such as nurses checking the patient's vital signs, interfere with the completion of the assessment. Patients often have limited stamina, particularly after undergoing taxing medical treatments, making it vital to conduct assessment in brief sessions (Belar & Deardorff, 1995).

Despite the impediments to psychological assessment in medical settings, there is increasing demand for accountability in health care, which necessitates that psychologists conduct comprehensive assessment in order to maximize quality of care (Dozois & Dobson, 2002). Comprehensive, quality care should include assessment of physical symptoms from a biopsychosocial perspective, involving evaluation of the patients' illness-related attitudes and beliefs, psychological distress, illness behavior, and social environment (Waddell and Turk, 2001).

CHAPTER TWO

Materials and Methods

Specific Aims

The aim of this dissertation is to:

1. Evaluate the Elkins Distress Inventory's convergent and divergent validity.
2. Evaluate the feasibility of the Elkins Distress Inventory as a brief measure of distress and as a component of a biopsychosocial battery for the assessment of pain and distress.

Research Design and Methods

Participants

Participants were 113 consecutive chronic pain patients who underwent the Division of Neuropsychology at Scott and White Memorial Hospital's standard pre-pain pump and pre-dorsal column stimulator neuropsychological evaluation.

Inclusionary Criteria

One hundred and thirteen pre-pain pump or pre-dorsal-column stimulator surgery patients referred for evaluation at the Scott and White Memorial Hospital Division of Neuropsychology were included in the retrospective chart review.

Exclusionary Criteria

Patients who exhibited signs of fatigue, excessive physical discomfort, or cognitive impairment during their standard pre-pain pump and pre-dorsal column

stimulator neuropsychological evaluation deemed by the neuropsychologist to interfere with the patient's ability to complete the full standard evaluation, or who did not complete all instruments included in the evaluation, were excluded from the retrospective chart review.

Instruments

Battery for Health Improvement-II (BHI-II). The Battery for Health Improvement-II is a 217-item self-report measure designed to assess physical and psychological symptoms of medical patients. The BHI-II consists of 18 scales which are "organized into five domains: Validity scales, Physical Symptom scales, Affective scales, Character scales, and Psychosocial scales." (Bruns & Disorbio, 2003). Norms were developed for both medical and community samples. Patients' responses are compared with norms, resulting in T-scores. Internal consistency for the scales comprising the BHI-II, as measured by Cronbach's alpha, ranged from .73 to .97. Test-retest reliability of the BHI-II scales ranged from .88 to .97. The BHI-II typically takes 35-45 minutes to complete (Bruns & Disorbio, 2003).

Beck Depression Inventory-II (BDI-II). The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item self-report rating inventory measuring depressive symptoms. Respondents rate the degree to which they have experienced 21 depressive symptoms over the preceding two-week period on a four-point Likert scale ranging from zero to three (Beck, Steer, & Brown, 1996). The individual item scores are then summed to provide a total score, which may range from 0-63. Moderate associations have been found between the BDI-II and other scales measuring depressive symptomatology, including the Hamilton

Psychiatric Rating Scale for Depression (.73), the Zung Self-Reported Depression Scale (.76), and the MMPI Depression Scale (.76) (Groth-Marnat, 1990). Test-retest reliability coefficients have varied from .48 to .86 depending upon the length of the time interval between administrations (Groth-Marnat, 1990). The BDI-II is considered to be the "gold standard" for the assessment of depressive symptoms. This scale is expected to take five to ten minutes to complete.

Beck Anxiety Inventory (BAI). On the BAI, respondents are asked to rate the degree to which they have experienced 21 anxiety-related symptoms over the preceding week on a four-point Likert scale ranging from zero (Not at all) to three (Severely) (Beck & Steer, 1990). Individual item scores are then summed to produce a total score, which can range from 0-63. In the normative sample, internal consistency ranged from .92 to .94 and the test-retest correlation coefficient was .75 with a one-week interval. Strong relationships have been found between the BAI and other self-report measures of anxiety and clinician ratings of patient anxiety, including the Hamilton Anxiety Rating Scale-Revised (r = .51) and the State-Trait Anxiety Inventory (r = .58) (Beck & Steer, 1990). This scale is expected to take five to ten minutes to complete.

Beck Hopelessness Scale (BHS). The BHS consists of 20 true-false items measuring pessimistic attitudes about the future. Individual items are scored either zero or one. Item scores are then summed to calculate the total score, which can range from zero to 20. Internal consistency ranged from .82 to .93 and test-retest reliability with a one-week interval was .69 (Beck & Steer, 1988). This scale is expected to take five to ten minutes to complete.

State-Trait Anger Expression Inventory-II (STAXI-II). The STAXI-II consists of 57 items rated on a four-point Likert scale measuring feelings of anger and behavioral expressions of anger. There is evidence of robust factor structure, as well as acceptable internal consistency and test-retest reliability (Spielberger, 1999). This scale is expected to take ten to fifteen minutes to complete.

Elkins Distress Inventory (EDI). Brief assessment tools measuring symptoms within a single domain of psychological distress, such as depression or anxiety, exist. However, there is currently a paucity of established brief assessment instruments designed to assess multiple dimensions of psychological distress. Consequently, Gary R. Elkins, Ph.D., developed the Elkins Distress Inventory in order to meet this clinical need for a single instrument measuring multiple components of psychological distress (i.e., depression, anxiety, hopelessness, anger, and suicidality). Dr. Elkins served as the advisor for this dissertation and gave his permission for the EDI to be utilized in this study. The EDI was developed in three phases. During the first phase, three doctoral level psychologists each generated up to 20 items for each of the target domains of distress. This resulted in 100 items. In the second stage of development, the number of items was reduced to 40 by eliminating overlapping items, as well as items that were poorly worded or did not appear to have adequate face validity as determined by the scale developer (Gary Elkins, Ph.D.). Five items were added in which the respondent was asked to rate his or her overall level of distress for each of the five domains along a ten-point numerical rating scale.

Using the 40-item version of the scale described above, principle components analysis with Promax rotation was used to evaluate construct validity. An oblique

rotation method was chosen in order to allow the factors to correlate and to provide more meaningful theoretical factors. The preliminary structure was analyzed with five subscales specified, given that the EDI was initially designed to measure five components of distress: depression, anxiety, hopelessness, anger, and suicidality. Items describing symptoms of anxiety, anger, and depression loaded as expected on their respective subscales. Eight items loaded on the anxiety factor (I have felt very tensed up; I have felt anxiety much of the time; I have worried a lot of the time; I have felt very nervous and jittery inside myself; I am very anxious; I have felt so anxious I just can't sit still; I have felt "stressed out" right now; and I have felt my heart racing all of the time). Six items loaded on the anger factor (I have felt irritated at people and things; I have felt angry about someone or something; I have felt angry; I believe people have seen me as being angry; I have been having thoughts of lashing out or hurting someone; and People have been getting on my nerves). Five items loaded on the depression factor (I have felt sad; Emotionally, I have been hurting; I have felt depressed; My mood has been low; and I have been tearful). Additionally, five items loaded on the hopelessness factor (I do not think things will get better for me; I have felt helpless to change my problems; The future seems to be dark for me; I believe things are going to get better for me; and I have felt safe and secure). An item on the "hopelessness" subscale, "I just feel hopeless right now" was dropped due to indiscriminate loading. In these analyses, a suicidality factor did not emerge, as the item inquiring about self-harm did not clearly load on a single factor. Thus, this dimension of distress is measured in the current version of the scale only by a ten-point numerical rating item in which the respondent rates his or her overall level of suicidality (0 = not at all suicidal, 10 = extremely suicidal). Although a factor

related to psychological well-being (e.g., “I feel calm;” “I have positive thoughts”) emerged, this was dropped from the scale. Items with relatively weak loadings, or which loaded on multiple factors, were then eliminated from the scale. This resulted in the current version of the scale, which contains a total of 19 items.

On the 19 items of the current scale, responses are made on a five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). On the current version of the EDI, five items are intended to measure depression, including “I have felt depressed,” “I have felt sad,” “My mood has been low,” “Emotionally, I have been hurting,” and “I have been tearful.” Five items are intended to measure anxiety, including “I have worried a lot of the time,” “I have felt very tensed up,” “I have felt so anxious I just can’t sit still,” “I have felt anxiety much of the time,” and “I have felt very nervous and jittery inside myself.” Four items are intended to measure hopelessness, including “I have felt safe and secure,” “The future has seemed to be dark for me,” “I have thought ‘things will never get better for me,’” and “I have felt helpless to change my problems.” Five items are intended to measure anger, including “People have been getting on my nerves,” “I have been having thoughts of lashing out at or hurting someone,” “I have felt angry about someone or something,” “I have felt irritated at people and things,” and “I believe people have seen me as being angry.” Additionally, the EDI includes five numerical rating scale items in which the respondent rates his or her level of depression, anxiety, anger, hopelessness, and suicidality on a zero to ten scale. The scores for the 19 five-point Likert scale items included in each subscale are summed in order to obtain subscale scores. One item on the hopelessness subscale, “I feel safe and secure,” must be reverse scored. The subscale scores are then added to

calculate the total score. The numerical rating items are scored separately and are not added into the total score (Elkins, Perfect, Rudd, Marcus, Schmitz, Bunn, et al., 2009). This scale is expected to take five to ten minutes to complete.

Procedure

During the standard pre-pain procedure psychological evaluation conducted by the Scott and White Division of Neuropsychology, 113 consecutive pain patients completed the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996), Beck Anxiety Inventory (Beck & Steer, 1990), Beck Hopelessness Scale (Beck & Steer, 1988), State-Trait Anger Expression Inventory-II (Spielberger, 1999), Elkins Distress Inventory, and The Battery for Health Improvement-II (Bruns & Disorbio, 2003) as part of the Division of Neuropsychology at Scott and White Memorial Hospital's standard pre-pain pump and pre-dorsal column stimulator neuropsychological evaluation. A psychometrician or member of the faculty of the Scott and White Division of Neuropsychology was present during the administration of the assessment instruments.

A retrospective chart review of 113 consecutive neuropsychological test records for pre-pain pump and pre-dorsal column stimulator neuropsychological evaluations, including demographic information, as well as individual item responses, raw score totals, and index scores for the Beck Depression Inventory-II, Beck Anxiety Inventory, Beck Hopelessness Scale, State-Trait Anger Expression Inventory-II, Elkins Distress Inventory, and the Battery for Health Improvement-II, was completed for 113 consecutive patients who underwent the Division of Neuropsychology at Scott and White Memorial Hospital's standard pre-pain pump and pre-dorsal column stimulator neuropsychological evaluation.

Data for the retrospective chart review were obtained from the aforementioned test records contained in the Scott and White Memorial Hospital Division of Neuropsychology's paper charts.

Protection of Patient Confidentiality

All identifying information were removed from data, and all data used for the retrospective chart review comply with HIPAA regulations. Patient charts are stored in locked cabinets. Data were entered into a database on a computer that is password-protected, and only employees of the Scott and White Memorial Hospital Division of Neuropsychology have access to the data.

Hypotheses

1. The Depression subscale of the Elkins Distress Inventory will exhibit strong positive correlations with overall score on the Beck Depression Inventory-II and the Depression scale of the BHI-II and will demonstrate weaker correlations with overall scores on the BAI, BHS, and STAXI-II.
2. The Anxiety subscale of the Elkins Distress Inventory will exhibit strong positive correlations with overall score on the Beck Anxiety Inventory and the Anxiety scale of the BHI-II and will demonstrate weaker correlations with overall scores on the BDI-II, BHS, and STAXI-II.
3. The Anger subscale of the Elkins Distress Inventory will exhibit strong positive correlations with the Anger Expression Index score on the State-Trait Anger Expression Inventory-II and the Hostility scale of the BHI-II and will demonstrate weaker correlations with overall scores on the BDI-II, BAI, and BHS.

4. The Hopelessness subscale of the Elkins Distress Inventory will exhibit strong positive correlations with overall score on the Beck Hopelessness Scale. Additionally, the Hopelessness subscale of the Elkins Distress Inventory will demonstrate weaker correlations with overall scores on the BDI-II, BAI, and STAXI-II.
5. The Elkins Distress Inventory will demonstrate internal consistency of .8 or higher.

Statistical Analysis

Hypothesis 1

The Depression subscale of the Elkins Distress Inventory will exhibit strong positive correlations with overall score on the Beck Depression Inventory-II and the Depression scale of the BHI-II and will demonstrate weaker correlations with overall scores on the BAI, BHS, and STAXI-II.

Analysis. The Pearson product-moment correlation coefficients between the Depression subscale of the EDI and the Depression scale of the BHI-II and total scores on the BDI-II, BAI, BHS, and STAXI-II was calculated.

Hypothesis 2

The Anxiety subscale of the Elkins Distress Inventory will exhibit strong positive correlations with overall score on the Beck Anxiety Inventory and the Anxiety scale of the BHI-II and will demonstrate weaker correlations with overall scores on the BDI-II, BHS, and STAXI-II.

Analysis. The Pearson product-moment correlation coefficients between the Anxiety subscale of the EDI and the Anxiety scale of the BHI-II and total scores on the BDI-II, BAI, BHS, and STAXI-II was calculated.

Hypothesis 3

The Anger subscale of the Elkins Distress Inventory will exhibit strong positive correlations with the Anger Expression Index score on the State-Trait Anger Expression Inventory-II and the Hostility scale of the BHI-II and will demonstrate weaker correlations with overall scores on the BDI-II, BAI, and BHS.

Analysis. The Pearson product-moment correlation coefficients between the Anger subscale of the EDI and the Hostility scale of the BHI-II and total scores on the BDI-II, BAI, BHS, and STAXI-II was calculated.

Hypothesis 4

The Hopelessness subscale of the Elkins Distress Inventory will exhibit strong positive correlations with overall score on the Beck Hopelessness Scale. Additionally, the Hopelessness subscale Elkins Distress Inventory will demonstrate weaker correlations with overall scores on the BDI-II, BAI, and STAXI-II.

Analysis. The Pearson product-moment correlation coefficients between the Hopelessness subscale of the EDI and total scores on the BDI-II, BAI, BHS, and STAXI-II was calculated.

Hypothesis 5

The Elkins Distress Inventory will demonstrate internal consistency of .8 or higher.

Analysis. Cronbach's alpha for items on the Elkins Distress Inventory was calculated.

Factor Analysis

Exploratory and confirmatory factor analysis procedures were conducted to determine factor loadings for the items on the Elkins Distress Inventory. Items were allowed to load on multiple factors. Four factors were expected to emerge on the EDI. Five EDI items were expected to load on a factor related to depression, including "I have felt depressed," "I have felt sad," "My mood has been low," "Emotionally, I have been hurting," and "I have been tearful." Five items were expected to load on a factor related to anxiety, including "I have worried a lot of the time," "I have felt very tensed up," "I have felt so anxious I just can't sit still," "I have felt anxiety much of the time," and "I have felt very nervous and jittery inside myself." Four EDI items were expected to load on a factor related to hopelessness, including "I have felt safe and secure," "The future has seemed to be dark for me," "I have thought 'things will never get better for me,'" and "I have felt helpless to change my problems." Five EDI items were expected to load on a factor related to anger, including "People have been getting on my nerves," "I have been having thoughts of lashing out at or hurting someone," "I have felt angry about someone or something," "I have felt irritated at people and things," and "I believe people have seen me as being angry."

CHAPTER THREE

Results

Demographics of the Sample

Table 1
Demographic factors of pain patients included in the study. All values are expressed as a percentage of the specified population

Gender	Male	33.3
	Female	66.7
Ethnicity	Caucasian	76.2
	African American	13.3
	Hispanic	7.6
	Asian or Pacific Islander	2.9

One hundred and thirteen pre-pain-pump or pre-dorsal column stimulator chronic pain patients were administered the Elkins Distress Inventory, BDI-II, BAI, BHS, STAXI-II, and BHI-II during the standard neuropsychological evaluation at the Scott and White Memorial Hospital Division of Neuropsychology. Eight patients did not complete the entire battery due to fatigue or cognitive limitations, and were therefore eliminated from the analyses, leaving a sample of 105 patients. Females comprised 66.7% of the patients, while 33.3% were male. In terms of ethnicity, 76.2% of the patients were Caucasian, 13.3% were African American, 7.6% were Hispanic, and 2.9% were Asian or Pacific Islander. The mean age of the patients was 51.24 years, with a mean of 13.77 years of education.

Correlations and Analysis of Convergent and Divergent Validity of EDI Subscales

Table 2
Correlations of the EDI-Total Distress and EDI Subscale Scores and Measures of Anxiety, Depression, Hopelessness, and Anger

Subscale or Total Distress	BDI-II	BAI	STAXI-II	BHS	BHI Depression	BHI Anxiety	BHI Hostility
EDI-Depression	**.662**	.616	.348	.525	**.667**	.400	.510
EDI-Anxiety	.674	**.634**	.352	.417	.557	**.458**	.501
EDI-Anger	.508	.416	**.554**	.467	.560	.477	**.656**
EDI-Hopelessness	.683	.459	.384	**.715**	.760	.409	.433
EDI-Total Distress	.736	.630	.475	.606	.736	.510	.618

EDI Depression Subscale

As expected, the Elkins Distress Inventory Depression subscale exhibited a strong positive correlation (r = .662) with the Beck Depression Inventory-II (BDI-II) total score, as well as with the Battery for Health Improvement Depression index (r = .667). These correlation coefficients are both significant at the .001 level, giving credence to the convergent validity of the Elkins Distress Inventory Depression subscale.

With respect to the divergent validity of the Elkins Distress Inventory Depression subscale, t-tests for significance of difference between correlation coefficients revealed that the correlation between the EDI Depression subscale score and the BDI-II total score was significantly greater than the correlation between the EDI Depression subscale score and the STAXI-II Anger Expression Index score ($t = 3.73$; $p < .0005$). Additionally, the correlation between the EDI Depression subscale score and the BDI-II was significantly greater than the correlation between the EDI Depression subscale score and the BHS total score ($t = 2.08$; $p < .025$). Although the correlation between the EDI Depression subscale

score and BDI-II total score (r = .662) was greater than the correlation between the EDI Depression subscale score and the BAI total score (r = .616), this difference was not statistically significant (t = .79; n.s.). Furthermore, the correlation between the EDI Depression subscale score and the BHI Depression index score (r = .667) was significantly greater than the correlation between the EDI Depression subscale score and the BHI Anxiety index (t = 4.10; p < .0005), and was also significantly greater than the correlation between the EDI Depression subscale score and the BHI Hostility index score (t = 2.37; p < .01). These analyses are largely supportive of the divergent validity of the Elkins Distress Inventory Depression subscale. However, the lack of a significant difference between the correlation between the EDI Depression subscale and the BDI-II and the correlation between the EDI Depression subscale and the BAI suggest that the EDI Depression subscale may also assess some symptoms that are related to anxiety.

EDI Anxiety Subscale

The Elkins Distress Inventory Anxiety subscale, as expected, demonstrated a strong positive correlation (.634) with the Beck Anxiety Inventory (BAI) total score, as well as with the Battery for Health Improvement Anxiety index (r = .458). Both of the aforementioned correlation coefficients are significant at the .001 level, supporting the convergent validity of the Elkins Distress Inventory Anxiety subscale. Notably, the Elkins Distress Inventory Anxiety subscale exhibited a stronger positive correlation with the BDI-II total score (r = .674) than with the BAI (r = .634). In addition, the EDI Anxiety subscale exhibited stronger positive correlations with the Battery for Health Improvement Depression (r = .557) and Hostility (r = .501) indices than with the BHI Anxiety index (r = .458). This is likely due in part to the common comorbidity of

depressive and anxiety symptoms, and the high intercorrelation between the EDI Anxiety and EDI Depression subscales (r = .666). Because depressive and anxiety symptoms frequently occur comorbidly, one would expect the EDI Anxiety subscale to correlate with measures of depressive symptomatology in addition to correlating in a strong positive manner with other measures of anxiety. Moreover, anxiety is comprised of affective, cognitive, and somatic components. The Beck Anxiety Inventory emphasizes somatic manifestations of anxiety to a greater degree than does the EDI Anxiety subscale, in that a large proportion of items on the BAI assess physical complaints, such as dizziness, racing of the heart, numbness, tingling, and sweating. This may have weakened the correlation between the EDI Anxiety subscale and the BAI, particularly in light of the fact that the sample consists of chronic pain patients, who are likely to endorse significant physical and somatic complaints. The correlation between the EDI Anxiety subscale and the BAI (r = .634) was greater to a statistically significant degree than the correlation between the EDI Anxiety subscale and the STAXI-II Anger Expression Index score ($t = 3.13$; $p < .005$), and was also significantly greater than the correlation between the EDI Anxiety subscale and the BHS ($t = 2.51$; $p < .01$). However, collectively, these analyses do not support the divergent validity of the EDI Anxiety subscale and suggest that the EDI Anxiety subscale measures symptoms that may be related to global psychological distress or aspects of distress other than anxiety, such as depression.

EDI Anger Subscale

The Elkins Distress Inventory Anger subscale, as expected, exhibited a strong positive correlation (r = .554) with the State-Trait Anger Expression Inventory (STAXI-

II) Anger Expression Index. Additionally, the EDI Anger subscale demonstrated a strong positive correlation (r = .656) with the Battery for Health Improvement Hostility index. These correlation coefficients are both significant at the .001 level, giving credence to the convergent validity of the EDI Anger subscale.

Pertaining to the divergent validity of the EDI Anger subscale, although the correlation between the EDI Anger subscale and the STAXI-II Anger Expression index (r = .554) is greater than the correlation between the correlation between the EDI Anger subscale and the Beck Anxiety Inventory, the difference between these correlations was not statistically significant (t = 1.47; n.s.). Likewise, though the correlation between the EDI Anger subscale and the STAXI-II Anger Expression index was greater than the correlation between the EDI Anger subscale and BDI-II, this difference was not statistically significant (t = .53; n.s.). Similarly, the difference between the correlation between the EDI Anger subscale and the STAXI-II and the correlation between the EDI Anger subscale and the Beck Hopelessness Scale was not statistically significant (t = 0.97; n.s.). However, the correlation between the EDI Anger subscale and the BHI Hostility index (r = .656) was significantly greater than the correlation between the EDI Anger subscale and the BHI Anxiety index (t = 3.10; $p < .0005$). The correlation between the EDI Anger subscale and the BHI Hostility index was greater than the correlation between the EDI Anger subscale and the BHI Depression index, though this difference was not statistically significant (t = 1.46; n.s.). Collectively, these analyses do not support the divergent validity of the EDI Anger subscale as a measure of anger symptoms distinctive of other aspects of psychological distress.

EDI Hopelessness Subscale

The Elkins Distress Inventory Hopelessness subscale, as expected, exhibited a strong positive correlation ($r = .715$) with the Beck Hopelessness Scale. This correlation is statistically significant at the .001 level, giving credence to the convergent validity of the EDI Hopelessness Scale. With respect to divergent validity, the correlation between the EDI Hopelessness scale and the BHS was significantly greater than the correlation between the EDI Hopelessness scale and the BAI ($t = 3.26$; $p < .005$). Likewise, the correlation between the EDI Hopelessness scale and the BHS was significantly greater than the correlation between the EDI Hopelessness scale and the STAXI-II Anger Expression index ($t = 4.14$; $p < .0005$). While the correlation between the EDI Hopelessness scale and the BHS was greater than the correlation between the EDI Hopelessness scale and the BDI-II, this difference was not statistically significant ($t = .56$; n.s.). However, this is not unexpected, as hopelessness is a common symptom of depression, and hopelessness and depression tend to occur comorbidly. On the basis of these analyses, support for the divergent validity of the EDI Hopelessness scale is inconsistent.

Reliability and Internal Consistency Analysis

Table 3
Reliability analysis for EDI subscales and total distress based on internal consistency measured by Cronbach's alpha

Subscale or Total Distress	Cronbach's alpha
EDI-Anxiety	0.883
EDI-Anger	0.849
EDI-Hopelessness	0.817
EDI-Depression	0.932
EDI-Total Distress	0.945

The above table lists the Cronbach's alpha coefficients for each of the Elkins Distress Inventory subscales, as well as for the Elkins Distress Inventory Total Distress score, which combines all 19 items. Based on the above Cronbach's alpha coefficients, all of the EDI subscales have very good internal consistency, as the Cronbach's alpha coefficients for the EDI subscales range from .817 to .932, and all exceed .80. This suggests that scores on the items included in each of the EDI subscales correlate well with each other, indicating that the items in the various subscales assess similar constructs and measure the component of psychological distress that they are intended to measure. The Cronbach's alpha of .945 for Total Distress on the EDI suggests that the measure has very good internal consistency, and that all 19 items of the EDI correlate well with each other and measure the construct of psychological distress.

Exploratory Factor Analysis

Table 4
Factor analysis loading values for the 19 questions of the EDS

	Anx	Ang	Hopeless	Dep
I have worried a lot of the time	.737			
I have felt very tensed up	.801			
I have felt so anxious I just can't sit still	.827			
I have felt anxiety much of the time	.846			
I have felt very nervous and jittery inside myself	.855			
People have been getting on my nerves		.763		
I have been having thoughts of lashing out at or hurting someone		.671		
I have felt angry about someone or something		.786		
I have felt irritated at people and things		.878		
I believe people have seen me as being angry		.741		
I have felt safe and secure (reverse scored)			.656	
The future has seemed to be dark for me			.854	
I have thought, "things will never get better for me"			.838	
I have felt helpless to change my problems			.797	
I have felt depressed				.835
I have felt sad				.890
My mood has been low				.877
Emotionally, I have been hurting				.807
I have been tearful				.832

Exploratory factor analysis was conducted utilizing Primary Components Analysis with Promax rotation in order to evaluate the construct validity and factor loadings of the items on the Elkins Distress Inventory. The Promax rotation, as expected, is suggestive of a four-factor underlying structure, which explains approximately 70.74% of the variability in item responses. Components were allowed to correlate, and items were allowed to load on multiple factors. However, conceptually similar items

demonstrated higher factor loadings. All 19 items of the Elkins Distress Inventory exhibited factor loadings of .656 or higher, which is supportive of the construct validity of the Elkins Distress Inventory items, and gives credence to the four-factor structure of the Elkins Distress Inventory. Five items loaded on a factor related to anxiety. These items included "I have worried a lot of the time," "I have felt very tensed up," "I have felt so anxious I just can't sit still," "I have felt anxiety much of the time," and "I have felt very nervous and jittery inside myself." Five items loaded on a factor related to anger, including "People have been getting on my nerves," "I have been having thoughts of lashing out at or hurting someone," "I have felt angry about someone or something," "I have felt irritated at people and things," and "I believe people have seen me as being angry." Four items loaded on a factor related to hopelessness. The items which loaded on the hopelessness factor included "I have felt safe and secure," "The future has seemed to be dark for me," "I have thought 'things will never get better for me,'" and "I have felt helpless to change my problems." The remaining five items loaded on a factor related to depression. The items loading on the depression factor included "I have felt depressed," "I have felt sad," "My mood has been low," "Emotionally, I have been hurting," and "I have been tearful."

Confirmatory Factor Analysis

A Chi-square test of goodness of fit (Chi-Square (df=104) = 19.88, p >.01) was not significant, which is supportive of the four-factor structure. However, the root mean square error of approximation (RMSEA) estimate was 0.05 and the comparative fit index (CFI) was 0.82. These model fit statistics fall below the desired cut-off points, suggesting that the four-factor model may not be the best-fit model for the EDI.

Gender Differences in Distress Endorsed

T-tests were conducted in order to compare the mean scores for males and females on each subscale of the EDI, as well as well as for Total Distress on the EDI, in order to look for possible gender differences in amount of psychological distress endorsed. Females endorsed significantly more anxiety ($t = 2.52$, $p = .013$), as well as more depression ($t = 2.69$, $p = .008$) than males. Additionally, females endorsed more Total Distress than males ($t = 2.50$, $p = .014$). Although women reported slightly higher levels of anger ($t = 1.86$, $p = .066$) and hopelessness ($t = 1.15$, $p = .253$) than males, these gender differences were not significant.

CHAPTER FOUR

Discussion and Conclusions

The results of this study support the validity and internal consistency of the Elkins Distress Inventory. The convergent validity of the EDI subscales was supported, although inconsistent results were found concerning the EDI's divergent validity. Specifically, there was a particular lack of support for the divergent validity of the EDI's Anxiety and Anger subscales, suggesting that these subscales might not measure distinct aspects of psychological distress. Further, while EDI items loaded most strongly on their expected factors, factor analysis procedures suggest that the four-factor structure of the EDI may not be the best-fit model.

The inconsistent results concerning the divergent validity of the EDI subscales are suggestive of a strong interrelationship between various components of psychological distress. This is consistent with previous literature that proposes that negative affect is a unified construct. Watson and Clark (1984) posit that "negative affectivity" is a dimensional disposition comprised of anxiety, neuroticism, anger, poor self-esteem, sadness, maladadjustment, negative cognitions, and lack of ego strength. Other models propose a two-dimensional model of affect, comprised of negative affectivity and positive affectivity, in which positive affectivity includes elation, excitement, enthusiasm, energy, and alertness (Watson & Tellegen, 1985). The Positive and Negative Affect Schedule, which consists of two ten-item scales comprised of terms describing positive and negative affective states to which individuals respond according to a five-point Likert

scale, was developed in order to assess affect in a manner consistent with this two-dimensional model (Watson, Clark, & Tellegen, 1988).

Despite questions concerning the factor structure of the EDI and the divergent validity of its subscales, the results of this study suggest that the Elkins Distress Inventory is a clinically useful and psychometrically sound measure for the assessment of overall psychological distress, as well as the evaluation of multiple dimensions of psychological distress, including depression, anxiety, anger, and hopelessness. In addition to its sound psychometric properties, as supported by the results of this study, the Elkins Distress Inventory is a brief measure that can be administered in approximately five to ten minutes. The brevity of the EDI increases its clinical utility and feasibility in medical settings. Although other measures of psychological distress exist, there is a need for a brief, reliable measure of psychological distress that can be feasibly administered in medical settings. Existing measures of psychological distress may be unsuitable and infeasible for use in medical settings, due to the length of these measures and the time and cognitive resources required for these measures to be completed. The psychometric properties and brevity of the Elkins Distress Inventory suggest that it may satisfy this need for a brief, multidimensional measure of psychological distress that can be feasibly administered and utilized in medical settings. Because of the current lack of a brief, psychometrically sound, multidimensional tool for assessing psychological distress in medical settings, symptoms of psychological distress tend to be underreported in medical settings, consequently compromising the treatment of patients' medical and psychological symptoms.

If administered in medical settings, the Elkins Distress Inventory can provide a feasible, clinically useful, and psychometrically sound means for physicians and patients to communicate regarding patients' psychological distress, thereby allowing for psychological distress to be detected and treated. Further, as previously discussed, multiple sources suggest that a positive correlation appears to exist between psychological distress and physical symptoms associated with medical conditions. Thus, increases in psychological distress tend to result in exacerbation of physical symptoms, while decreases in psychological symptoms tend to be accompanied by reduction of physical symptoms. It follows that, if the Elkins Distress Inventory is utilized to facilitate assessment and treatment of psychological distress in medical settings, then physical symptoms associated with medical conditions can be treated in a more efficient, effective, and thorough manner. Thus, physical symptoms are likely to decrease in severity as psychological symptoms diminish following assessment and treatment. Likewise, as physical symptoms decline and are treated more effectively, aided by the assessment of psychological distress, then the psychological distress endured by patients is also likely to ameliorate.

A limitation of this study is that the demographic makeup of the sample is predominantly female and Caucasian. However, this is not surprising, as female and Caucasians tend to be more likely to seek medical treatment. Another limitation of this study is that it consists of self-report questionnaires. As is the case with any self-report questionnaire, the accuracy and validity of the data for the questionnaires utilized in this study are dependent upon the honesty and accuracy with which the patients or participants complete them. Given that the participants in this study were undergoing a

pre-pain pump or pre-dorsal-column-stimulator surgical neuropsychological evaluation, the participants may have responded to the questionnaires in a manner to present themselves as good candidates for surgery. However, if this took place, the participants likely would have responded to all questionnaires fairly consistently in this manner. Thus, the correlations between the assessment instruments, on which the conclusions regarding the validity of the Elkins Distress Inventory are based, would not likely be significantly affected.

Future directions for research include administration of the Elkins Distress Inventory to individuals facing medical conditions or physical ailments other than chronic pain. The EDI is likely to exhibit clinical utility and sound psychometric properties for assessing psychological distress associated with a variety of medical conditions and physical ailments in addition to chronic pain. Further, a developmentally appropriate version of the EDI may be developed for use with pediatric populations. To accomplish this, a version of the EDI in which the reading level required to complete the measure is lower, or in which pictoral images are included, could be devised. Additionally, future studies could involve obtaining physician ratings of the clinical utility of the Elkins Distress Inventory, as well as patient ratings of the degree to which the Elkins Distress Inventory informed and enhanced assessment and treatment of their physical and psychological symptoms. Such studies would further elucidate the clinical utility of the Elkins Distress Inventory for assessing psychological symptoms in medical settings.

APPENDICES

APPENDIX A

Response Distributions, Means, and Standard Deviations for EDI Items

Table A.1
Response distributions, means, and standard deviations for EDI items

Item #	Frequency (%)	SD	D	N	A	SA	Mean	Standard Deviation
1	I have worried a lot of the time	16.2	26.7	18.1	25.7	13.3	2.93	1.31
2	I have felt very tensed up	16.2	19.0	20.0	33.3	11.4	3.05	1.28
3	I have felt so anxious I just can't sit still	27.6	46.7	11.4	5.7	8.6	2.21	1.17
4	I have felt anxiety much of the time	33.3	33.3	10.5	17.1	5.7	2.29	1.25
5	I have felt very nervous and jittery inside myself	35.2	31.4	14.3	16.2	2.9	2.20	1.17
6	People have been getting on my nerves	30.5	26.7	18.1	17.1	7.6	2.45	1.29
7	I have been having thoughts of lashing out or hurting someone	72.4	20.0	5.7	1.0	1.0	1.38	.73
8	I have felt angry about someone or something	40.0	20.0	11.4	19.0	9.5	2.38	1.42

(continued)

Item #	Frequency (%)	SD	D	N	A	SA	Mean	Standard Deviation
9	I have felt irritated at people and things	32.4	13.3	17.1	31.4	5.7	2.65	1.37
10	I believe people have seen me as being angry	41.0	24.8	18.1	11.4	4.8	2.14	1.21
11	I have felt safe and secure	36.2	33.3	17.1	7.6	5.7	2.13	1.16
12	The future has seemed to be dark for me	43.8	31.4	12.4	8.8	3.8	1.97	1.12
13	I have thought "things will never get better for me"	42.9	26.7	9.5	17.1	3.8	2.12	1.25
14	I have felt helpless to change my problems	32.4	26.7	15.2	21.9	3.8	2.38	1.25
15	I have felt depressed	24.8	20.0	19.0	31.4	4.8	2.71	1.28
16	I have felt sad	21.0	17.1	20.0	37.1	4.8	2.88	1.25
17	My mood has been low	22.9	20.0	23.8	27.6	5.7	2.73	1.25
18	Emotionally, I have been hurting	28.6	20.0	19.0	27.6	4.8	2.60	1.29
19	I have been tearful	28.6	22.9	18.1	23.8	6.7	2.57	1.31

SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

APPENDIX B

Means and Standard Deviations for EDI Subscales and EDI Total Distress

Table B.1
Means and standard deviations for EDI subscales and EDI total distress

EDI Subscale or Total Distress	Overall Sample Mean	Overall Sample Standard Deviation	Female Mean	Female Standard Deviation	Male Mean	Male Standard Deviation
EDI-Anxiety	12.68	5.11	13.54	5.36	10.94	4.12
EDI-Anger	11.00	4.85	11.61	4.94	9.77	4.48
EDI-Hopelessness	8.61	3.84	8.91	4.06	8.00	3.34
EDI-Depression	13.50	5.66	14.51	5.56	11.46	5.35
EDI-Total Distress	45.78	16.68	48.59	17.19	40.17	14.23

BIBLIOGRAPHY

Aben, I., Lousberg, R., & Honig, A. (2002). Validity of the Beck Depression Inventory, Hospital Anxiety and Depression Scale, SCL-90, and Hamilton Depression Rating Scale as Screening Instruments for Depression in Stroke Patients. *Psychosomatics*, 43, 386-393.

Andersson, G. B., Pope, M. H., & Frymoyer, J. W. (1984). Epidemiology. In M. H. Pope & J. W. Frymoyer (EDI.), *Occupational low back pain* (pp. 115-124), New York: Praeger.

Arnow, B. A., Blasey, C. M., Lee, J., Fireman, B., Hunkeler, E. M., & Dea, R. (2009). Relationships among depression, chronic pain, chronic disabling pain, and medical costs. *Psychiatric Services, 60,* 344-350.

Baune, B. T., Caniato, R. N., Garcia-Alcaraz, M. A., & Berger, K. (2008). Combined effects of major depression, pain and somatic disorders on general functioning in the general adult population. *Pain, 138,* 310-317.

Beck, A.T. & Steer, R.A. (1990). *Beck Anxiety Scale Manual*. San Antonio: The Psychological Corporation.

Beck, A.T. & Steer, R.A. (1988). *Beck Hopelessness Scale Manual*. San Antonio: The Psychological Corporation.

Beck, A.T., Steer, R.A. & Brown, G.K. (1996). *Beck Depression Inventory-II Manual*. San Antonio: The Psychological Corporation.

Belar, C. D. (1997). Psychological assessment in capitated care: Challenges and opportunities. In J. N. Butcher (Ed.), *Personality assessment in managed health care: Using the MMPI-2 in treatment planning* (pp. 73-80), New York, NY: Oxford University Press.

Belar, C. D., & Deardorff, W. W. (1995). Special issues in assessment and intervention. In C. D. Belar & W. W. Deardorff (EDI.), *Clinical health psychology in medical settings: A practitioner's guidebook* (pp. 101-135), Washington, DC: American Psychological Association.

Bruns, D., & Disorbio, J. M. (2003). *Battery for Health Improvement-II: A Brief Introduction.* Minneapolis: Pearson.

Bufka, L. F., Crawford, J. I., & Levitt, J. T. (2002). Brief screening assessments for managed care and primary care. In M. M. Antony & D. H. Barlow (EDI.), *Handbook of assessment and treatment planning for psychological disorders* (pp. 38-63), New York, NY: Guilford.

Chiles, J. A., Lambert, M. J., & Hatch, A. L. (1999). The impact of psychological interventions on medical cost offset: A meta-analytic review. *Clinical Psychology: Science and Practice, 6,* 204–219.

Closs, S. J., Staples, V., Reid, I., Bennett, M. I., & Briggs, M. (2009). The impact of neuropathic pain on relationships. *Journal of Advanced Nursing, 65,* 402-411.

Cummings, N. A. (1997). Behavioral health in primary care: Dollars and sense. In N. A. Cummings, J. L. Cummings, & J. N. Johnson (EDI.), *Behavioral health in primary care: A guide for clinical integration.* Madison, CT: Psychosocial Press.

Cummings, N. A. (2001). A new vision of healthcare for America. In N. A. Cummings, W. O'Donohue, S. C. Hayes, & V. Follette (EDI.), *Integrated behavioral healthcare: Positioning mental health practice with medical/surgical practice.* San Diego: Academic Press.

Derogatis, L. R. (2000). *Brief Symptom Inventory 18: Administration, Scoring, and Procedures Manual*. National Computer Systems Inc.: Minneapolis, MN.

Deyo, R. A., & Tsui-Wu, Y. J. (1987). Descriptive epidemiology of low back pain and its related medical care in the United States. *Spine,* 12, 264.

Dozois, D. J. A., & Dobson, K. S. (2002). Depression. In M. M. Antony & D. H. Barlow (EDI.), *Handbook of assessment and treatment planning for psychological disorders* (pp. 259-299), New York, NY: Guilford.

Elkins, G., Perfect, M., Rudd, M. D., Marcus, J., Schmitz, B., Bunn, J., et al. (2009). *Development of a multi-dimensional measure of distress: The Elkins distress scale*. Manuscript in progress.

Feldman, D., Rabinowitz, J., & Ben Yehuda, Y. (1995). Detecting psychological distress among patients attending secondary health care clinics. Self-report and physician rating. *General Hospital Psychiatry, 17,* 425-432.

Ferraz, M. B., Quaresma, M. R., Aquino, L. R. L., Atra, E., Tugwell, P., & Goldsmith, C. H. (1990). Reliability of pain scales in the assessment of literate and illiterate patients with rheumatoid arthritis. *Journal of Rheumatology, 17,* 1022-1024.

Filiberti, A., & Ripamonti, C. (2002). Suicide and suicidal thoughts in cancer patients. *Tumori, 88,* 193-199.

Folkard, S., Glynn, C. J., & Lloyd, J. W. (1976). Diurnal variation and individual differences in the perception of intractable pain. *Journal of Psychosomatic Research, 20,* 289-301.

Frymoyer, J. W., Pope, M. H., Costanza, M. C., Rosen, J. C., Goggin, J. E., & Wilder, D. G. (1980). Epidemiological studies of low back pain. *Spine,* 5, 419-423.

Gallo, J. J., Zubritsky, C., Maxwell, J., Nazar, M., Bogner, H. R., Quijano, L. M., et al. (2004). Primary care clinicians evaluate integrated and referral models of behavioral health care for older adults: Results from a multisite effectiveness trial (PRISM-E). *Annals of Family Medicine, 2,* 305-309.

Gil, K. M., Williams, D. A., Keefe, F. J., & Beckham, J. C. (1990). The relationship of negative thoughts to pain and psychological distress. *Behavior Therapy, 21,* 349-362.

Groth-Marnat, G. (1990). The handbook of psychological assessment (2nd ed.). New York: John Wiley & Sons, New York.

Hall, A., Hern, R. A., & Fallowfield, L. (1999). Are we using appropriate self-report questionnaires for detecting anxiety and depression in women with early breast cancer? *European Journal of Cancer, 35(1),* 79-85.

Hansen, M. S., Fink, P., Frydenberg, M., de Jonge, P., & Huyse, F. J. (2001). Complexity of care and mental illness in medical inpatients. *General Hospital Psychiatry, 23,* 319-325.

Holbrook, T., Grazier, K., Kelsey, J., & Stauffer, R. (1984). The frequency of occurrence, impact, and cost of selected musculoskeletal conditions in the United States. Chicago, IL: American Academy of Orthopedic Surgeons.

Hummel, M., Lu, P., Cummons, T. A., & Whiteside, G. T. (2008). The persistence of a long-term negative affective state following the induction of either acute or chronic pain. *Pain, 140,* 436-445.

Jensen, M. P., & Karoly, P. (2001). Self-report scales and procedures for assessing pain in adults. In D. C. Turk & R. Melzack (EDI.), *Handbook of pain assessment* (2nd ed., pp. 15-34), New York, NY: Guilford.

Joyce, C. R. B., Zutshi, D. W., Hrubes, V., & Mason, R. M. (1975). Comparison of fixed interval and visual analogue scales for rating chronic pain. *European Journal of Clinical Pharmacology, 8,* 415-420.

Kalichman, L. (2009). Association between fibromyalgia and sexual dysfunction in women. *Clinical Rheumatology, 28,* 365-369.

Kessler, R. C., Avenevoli, S., & Merikangas, K. R. (2001). Mood disorders in children and adolescents: An epidemiologic perspective. *Biological Psychiatry, 49*, 1002-1014.

Kiecolt-Glaser, J. K., Robles, T. F., & Glaser, R. (2002). Psychoneuroimmunology: Psychological influences on immune function and health. *Journal of Consulting and Clinical Psychology*, *70*, 537–547.

Krantz, D. S., Sheps, D. S., Carney, R. M., & Natelson, B. H. (2000). Effects of mental stress in patients with coronary artery disease: Evidence and clinical implications. *Journal of the American Medical Association*, *283*, 1800–1802.

Krefetz, D. G., Steer, R. A., Gulab, N. A., & Beck, A. T. (2002). Convergent validity of the Beck Depression Inventory-II with the Reynolds Adolescent Depression Scale in psychiatric inpatients. *Journal of Personality Assessment*, *78*, 451-460.

Kutcher, S., Leblanc, J., Maclaren, C., & Hadrava, V. (2001). A randomized trial of a specific adherence enhancement program in Sertralinetreated adults with major depressive disorder in a primary care setting. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 26*, 591–596.

Lees, N., & Lloyd-Williams, L. (1999). Assessing depression in palliative care patients using the visual analogue scale: A pilot study. *European Journal of Cancer Care, 8*, 220-223.

Levant, R. (2004, May). *Psychological approaches to the management of health and disease: Healthcare for the whole person.* Keynote address presented at the Psychological Approaches to Disease Management Conference, Reno, NV.

Linden, W., Stossel, C., & Maurice, J. (1996). Psychosocial interventions for patients with coronary artery disease: A meta-analysis. Archives of Internal Medicine, 156, 745–752.

Mardini, H. E., Kip, K. E., & Wilson, J. W. (2004). Crohn's disease: a two-year prospective study of the association between psychological distress and disease activity. *Digestive Diseases and Sciences*, *49*, 492-497.

Miaskowski, C. (2009). Pharmacologic management of sleep disturbances in noncancer-related pain. *Pain Management Nursing, 10(1),* 3-13.

Miller, C. L., Druss, B. G., Dombrowski, E. A., & Rosenheck, R. A. (2003). Barriers to primary care among patients at a community mental health center. *Psychiatric Services*, *54*, 1158–1160.

Miranda, J., Schoenbaum, M., & Sherbourne, C. (2004). Effects of primary care depression treatment on minority patients' clinical status and employment. *Archives of General Psychiatry*, *61*, 827-834.

Montgomery, C., Lydon, A., & Lloyd, K. (1999). Psychological distress among cancer patients and informed consent. *Journal of Psychosomatic Research, 46,* 241-245.

Nagi, S. Z., Riley, L. E., & Newby, L. G. (1973). A social epidemiology of back pain in a general population. *Journal of Chronic Diseases, 26,* 769-779.

National Center for Health Statistics. (1981). Prevalence of selected impairments, United States-1977. Washington, DC: U.S. Government Printing Office.

Nyklicek, I., & Denollet, J. (2009). Development and evaluation of the Balanced Index of Psychological Mindedness (BIPM). *Psychological Assessment, 21(1),* 32-44.

O'Conner, A. B. (2009). Neuropathic pain: Quality-of-life impact, costs, and cost-effectiveness of therapy. *Pharmacoeconomics, 27(2),* 95-112.

Osman, A., Kopper, B. A., Barrios, F., Gutierrez, P. M., & Bagge, C. L. (2004). Reliability and validity of the Beck Depression Inventory-II with adolescent psychiatric inpatients. *Psychological Assessment, 16(2),* 120-132.

Pan, A., Lucas, M., Sun, Q., Van Dam, R. M., Franco, O. H., Manson, J. E., et al. (2010). Bidirectional association between depression and Type 2 diabetes mellitus in women. *Archives of Internal Medicine, 170 (21),* 1884-1891.

Preuper, H. R. S., Reneman, M. F., Boonstra, A. M., Dijkstra, P. U., Versteegen, G. J., & Geertzen, J. H. B. (2007). The relationship between psychosocial distress and disability assessed by the Symptom Checklist-90-Revised and Roland Morris Disability Questionnaire in patients with chronic lower back pain. *The Spine Journal, 7,* 525-530.

Radbruch, L., Sabatowski, R., Loick, G., Jonen-Thielemann, I., Kasper, M., Gondek, B., et al. (2000). Cognitive impairment and its influence on pain and symptom assessment in a palliative care unit: development of a Minimal Documentation System. *Palliative Medicine, 14,* 266-276.

Rapp, S. R., Parisi, S. A., & Walsh, D. A. (1988). Psychological dysfunction and physical health among elderly medical inpatients. *Journal of Consulting and Clinical Psychology, 56,* 851–855.

Rogers, R. (2003). Standardizing DSM-IV diagnoses: The clinical applications of structured interviews. *Journal of Personality Assessment, 81,* 220-225.

Roth, A. J., & Massie, M. J. (2007). Anxiety and its management in advanced cancer. *Current Opinion in Supportive and Palliative Care, 1(1),* 50-56.

Roy-Byrne, P. P., Katon, W., Cowley, D. S., & Russo, J. (2001). A randomized effectiveness trial of collaborative care for patients with panic disorder in primary care. *Archives of General Psychiatry, 58,* 869-876.

Shacham, S., & Daut, R. (1981). Anxiety or pain: What does the scale measure? *Journal of Consulting and Clinical Psychology, 49,* 468-469.

Shih, M., Hootman, J. M., Strine, T. W., Chapman, D. P., & Brady, T. J. (2006). Serious psychological distress in U. S. adults with arthritis. *Journal of General Internal Medicine, 21,* 1160-1166.

Simon, G. E., Ludman, E. J., Unutzer, J., Bauer, M. S., Operskalski, B., & Rutter, C. (2005). Randomized trial of a population-based care program for people with bipolar disorder. *Psychological Medicine, 35(1),* 13-24.

Smith, T. W., Follick, M. J., Ahern, D. K., & Adams, A. (1986). Cognitive distortion and disability in chronic low back pain. *Cognitive Therapy & Research,* 10, 201-210.

Sollner, W., DeVries, A., Steixner, E., Lukas, p., Sprinzl, G., Rumpold, G., et al. (2001). How successful are oncologists in identifying patient distress, perceived social support, and need for psychosocial counseling? *British Journal of Cancer, 84,* 179-185.

Speer, D. C., & Schneider, M. G. (2003). Mental health needs of older adults and primary care: Opportunity for interdisciplinary geriatric team practice. *Clinical Psychology: Science and Practice, 10(1),* 85–101.

Spielberger, C. D. (1999). *Manual for the State-Trait Anger Expression Inventory-II – 2*. Odessa, FL: Psychological Assessment Resources, Inc.

Sternbach, R. A. (1977). Psychological aspects of chronic pain. *Clinical Orthopedics and Related Research,* 129, 150-155.

Sullivan, M. J. L., Bishop, S. R., & Pivik, J. (1995). The Pain Catastrophizing Scale: Development and validation. *Psychological Assessment, 7,* 524-532.

Tamiya, N., Araki, S., & Ohi, G. (2002). Assessment of pain, depression, and anxiety by visual analogue scale in Japanese women with rheumatoid arthritis. *Scandinavian Journal of Caring Sciences, 16(2),* 137-141.

Verbosky, L. A., Franco, K. N., & Zrull, J. P. (1993). The relationship between depression and length of stay in the general hospital patient. *Journal of Clinical Psychiatry, 54(5),* 177-181.

Vitek, L., Rosenzweig, M. Q., & Stollings, S. (2007). Distress in patients with cancer: Definition, assessment, and suggested interventions. *Clinical Journal of Oncology Nursing, 11,* 413-418.

Wachter, K. (2003). Collaborative care boosts patient compliance, physician satisfaction. *Clinical Psychiatry News, 31,* 65–66.

Waddell, G. (1998). *The back pain revolution*. London: Churchill Livingstone, 1998.

Waddell, G., & Turk, D. C. (2001). Clinical assessment of low back pain. In D. C. Turk & R. Melzack (EDI.), *Handbook of pain assessment* (2nd ed., pp. 259-299), New York, NY: Guilford.

Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin, 96,* 465-490.

Watson, D., Clark, L. A., & Tellegen, A. Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54,* 1063-1070.

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin, 98,* 219-235.

Woolrich, R. A., Kennedy, P., Tasiemski, T. (2006). A preliminary psychometric evaluation of the Hospital Anxiety and Depression Scale (HADS) in 963 people living with a spinal cord injury. *Psychology, Health, & Medicine, 11(1),* 80-90.