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Chapter 1

Review of the Literature

Chronic pain is an affliction that lacks apparent biological evidence and has persisted beyond the normal tissue healing time of three months (Harstall & Ospina, 2003). Chronic pain among older adults is a tremendous problem, with rates estimated as high as 35.5% (range of 10.1%-55.2%) in the general population according to Harstall and Ospina’s meta-analysis consisting of 13 publications. The analysis also concluded that the prevalence of the most intense and severe chronic pain among adults is approximately 11%. Among older veterans in particular, chronic pain is a frequent problem that often results directly from their military service. Despite epidemic levels of chronic pain among older adults, treatment options are severely lacking. The standard treatments for chronic pain suffer from one or more of three main problems: 1) high cost, 2) low effectiveness, 3) high time commitment. As a result of these issues, older veterans do not get the treatment that they need.

Healthcare expenditure in the United States is steadily increasing. More and more Americans turn to medicine and surgery rather than psychological or behavioral methods to deal with life’s issues. Whether the increased prices are the result of technological innovations, higher standards of living, pressure from insurance companies, or any other number of explanations, the cost of medical care is currently rising faster than any other
service industry (Sennholz, 2006). Among the many reasons that more Americans are seeking medical treatment, chronic pain is one of the most common, disabling, and costly (Harstall & Ospina, 2003).

Chronic pain affects 75-85 million people in the United States, 50 million of whom are partially or totally disabled (Berman & Swyers, 1997). One analysis indicated that approximately 57% of all American adults reported recurrent pain, with 62% of these individuals having experienced their pain for longer than a year (Gatchel, Peng, Fuchs, Peters, & Turk, 2007). Moreover, 40% of individuals who reported pain indicated that they were constantly in pain.

In America, pain is the most frequent reason for physician consultation, comprising nearly 50% of chief complaints (Turk & Mccarberg, 2005). The chronicity and insistent nature of this condition can create a significant financial burden. The average yearly cost to patients seeking treatment at pain-treatment facilities ranges from $1,380 to $97,670, with an average price of $35,651 (Turk & Burwinkle, 2005). Turk and Mccarberg reported the total annual costs of chronic pain (including treatment, lost productivity, lost tax revenue, treatment side effects, disability payments, and legal fees) in the United States to be estimated between $150 and $215 billion. They also suggested that the cost of healthcare alone for these patients may exceed the costs of coronary artery disease, cancer, and AIDS, combined.

Pain is not a normal consequence of growing older. Likewise, many cases of chronic pain in older adults are considered pathological in nature (Helme, 2001). At some point during the aging process, the normal development of the patient’s body was interrupted by either disease or injury. Nevertheless, the pervasiveness of chronic pain is
consistently higher among the growing population of older adults when compared to younger adults. Harstall and Ospina (2003) report that the frequency of chronic pain in adults aged 65 years and older may be as high as 50.2%, with a greater occurrence among females than males. Some possible explanations for why the frequency is so much higher in older adults may be greater wear and tear on joints and muscles, decrease in physical activity, and, more often than not, comorbidity with other medical conditions (Gagliese & Melzack, 1997).

Naturally, the financial burden of healthcare is especially oppressive for this demographic because many older individuals have retired from their careers and no longer have steady incomes. In fact, about 3.6 million older adults live below the poverty level in America (Greenberg, 2005). Poverty is a particularly troublesome problem for veterans: as veterans grow older, their unemployment rates significantly increase compared to their nonveteran peers (United States Department of Labor, 2004). Therefore, older veterans who have a high risk for medical problems often lack the resources to seek adequate treatment. This is a very unsettling reality, given the sacrifices that members of this population have made for their country.

Traditional Treatments for Chronic Pain

**Pharmacological Intervention.** Pharmacological methods are, by far, the most commonly used approach to regulate chronic pain; in fact, pain-management drugs are the second-most prescribed medications in all physicians’ office and emergency room visits (Turk & McCrateberg, 2005). The recommended prescription for management of chronic pain may include tricyclic antidepressants or anticonvulsant medications due to their demonstrated effectiveness in controlled trials (Dworkin et al., 2003). Based on the
frequency of prescription, one might presume that medication was the most effective way
to manage chronic pain. In spite of their extensive use by physicians, however,
prescriptions for chronic pain often do not live up to patients’ expectations. Turk and
Burwinkle (2005) reviewed the literature on chronic pain treatments and indicated that
the medications that are currently available are only palliative; that is, none of the
medications cure the problem or completely eliminate pain. Furthermore, the current
costs of pharmacological treatment may not outweigh these limited benefits. The cost of
tricyclic antidepressants and anticonvulsant drugs increased 34% in 2001, and the annual
expense to chronic pain patients can exceed $5,000 (Straus, 2002). Turk and Burwinkle
found that the price of opioids, the most potent analgesics prescribed for chronic pain,
increased by 33% from 2000 to 2001, and may also exceed $5,000 for each patient per
year. Moreover, they indicated that the overall rate of pain reduction following use of
opioid medications is only 33%. Due to the large number of patients who use these
drugs, additional concerns could be considerably onerous, including adverse side effects,
abuse and misuse, dependence, or illicit trading. Hence, the cost ineffectiveness and
limited relief resulting from pharmacological treatments certainly restricts their efficacy
for patients suffering from chronic pain.

**Surgical Intervention.** According to Turk and Burwinkle’s review (2005), the
next most widely-used method for chronic pain management is surgery. Within the
category of patients seeking surgery, one of the most common medical concerns is
chronic back pain. They found that about one-third of the patient cost of spinal cord
injuries is attributed to surgical investigations, in spite of unclear empirical evidence for
many of the procedures that are used. Approximately 317,000 lumbar surgeries (at a cost
of around $25,000 each) are performed each year primarily to treat pain. Therefore, they concluded that the expense of lumbar surgeries in the United States exceeds over $7.9 billion annually. Furthermore, it is suggested that up to 70% of surgery patients actually report sustained or worsening of their pain following the procedure. The invasiveness, cost, and poor outcome of most surgical procedures make them a “last resort” method of relieving chronic pain.

**SCS & IDD Intervention.** Spinal cord stimulators (SCSs) and implantable drug delivery systems (IDDSs) are sophisticated devices that can be surgically implanted within the body to treat chronic pain (Turk & Burwinkle, 2005). In a sense, these methods represent a synthesis of pharmacological and surgical interventions. Whereas SCSs are electrodes placed along the spinal cord to interrupt the transmission of sensations from the peripheral nervous system to the brain, the IDDSs embed a pump and a reservoir that contains analgesic (typically opioid) medication. Turk and Burwinkle indicated that, unfortunately, only 5% to 31% of patients with SCSs eventually return to work, and their total expenditure is about $161,957. Thus, while some studies report positive outcomes (reduction in pain), these methods are extremely expensive. The 5-year costs of SCSs and IDDSs can range from $82,893 to $125,102 per patient. The combination of these high prices, questionable outcomes, intrusiveness, treatment for adverse effects, and other complications, makes SCSs and IDDSs a less than desirable treatment for recurrent pain.

**Anesthetic Intervention.** Local anesthesia (also known as nerve blocks, epidural steroids, or regional anesthesia) is a third method that is typically used to treat chronic pain (Turk & Burwinkle, 2005). This technique, which is less invasive than surgical
techniques, creates some symptomatic relief by injecting anesthetic or neurodestructive agents. Unfortunately, pain frequently returns for these patients within a few hours or days after each injection. Furthermore, local anesthesia costs Americans approximately $1.8 billion per year. Again, both the high cost and limited effectiveness of this technique narrow its range of utility for treating chronic pain patients.

**Cognitive/Behavioral Intervention.** Cognitive Behavior Therapy (CBT) is a structured psychotherapeutic technique designed to modify clients' attitudes, beliefs, feelings, behaviors, and thoughts that could impact their pain experience (Yonan & Wegener, 2003). A meta-analysis of 25 randomized, controlled trials revealed that, compared with alternative treatments, cognitive behavioral treatments for chronic pain generate significant changes in pain experience, positive coping, and reduced behavioral pain expression (Morley, Eccleston, & Williams, 1999). For example, CBT was used for pain patients from an older-adult sample to teach relaxation-based strategies to self-regulate the physiological processes that impact pain (Middaugh, Woods, Kee, Harden, & Peters, 1991). These researchers indicated decreased pain and respiration rate within and across their training sessions. Furthermore, research has demonstrated the efficacious use of CBT for pain management for patients aged 18-80 who were diagnosed with rheumatoid arthritis (Sharpe et al., 2001). Specifically, these patients were able to divert their attention, change their pain coping skills, and modify both joint movement and depressive symptoms. The current study utilizes a modified CBT intervention.

Sternbach (1978, as cited in Kabat-Zinn, 1982) emphasized the efficacious usage of psychological and behavioral strategies in treating chronic pain over traditional surgery or pharmaceutical techniques. This argument was examined more recently by
Austrian, Kerns, and Reid (2005), who also found that chronic pain is a highly prevalent problem, especially in older adults, and contributes to psychological distress. Their investigation focused on the willingness of people over the age of 65 years to participate in exercise and relaxation programs to manage their chronic pain. Findings indicated the majority of older people were willing to undertake these therapies, but infrequently did so because of perceived barriers. The barrier predicated by the most substantial number of participants was the lengthy time commitment required by these types of therapies.

The excessive costs associated with traditional chronic pain treatment are considerable for healthcare systems, older adults, and society as whole. As the preceding information indicates, the current trend in interventions for chronic pain is to reduce or eliminate pain. This objective is the agenda of pharmacological, surgical, and cognitive-behavioral interventions (McCracken, 1998). Certainly, pain control is clearly effective when it leads to the long-term improvement in overall functioning of a patient with chronic pain. In cases where pain is easier to control, this control yields a greater quality of life for the patient. Paradoxically, however, there are many instances in which patients could benefit more from accepting their conditions as they are, rather than attempting to change them (McCracken, Carson, Eccleston, & Keefe, 2004). Treatments that aim to control pain are associated with a number of problems, including a tendency to dominate a patient’s life and the occurrence of undesirable physical and psychological side effects. More importantly, these treatments often make it more difficult for patients to prioritize the things that they may value most in their lives, such as health, working, and spending time with their family and friends. Pushing the “pain control” objective for patients is associated with their extended rest, avoidance of activity, medication consumption,
repeated medical consultations/procedures, and early retirement from work (McCracken, Carson, Eccleston, & Keefe). In essence, many individuals sacrifice their quality of living in order to control their chronic pain. Consequently, alternative methods of chronic pain management must be assigned high priority for psychological research.

Theories of Chronic Pain

McCracken and Eccleston (2005) report that, for patients with chronic pain, significantly healthier functioning can result from maintaining a sense of willingness to have pain and engage in activities regardless of their pain. Struggling to “fix” chronic pain, in contrast, does not lead to healthy life management. Many chronic pain patients struggle with their situation, and experience emotional suffering due to a fixation on their unfortunate state (McCracken, Gauntlett-Gilbert, & Vowles, 2007). According to Kabat-Zinn (1982), mindfulness meditation can help a client consciously self-regulate this attentional focus to alleviate suffering. Stone (2006) related this attentional awareness to the sensation of pain. Painful feelings, as described by Stone, are instinctively felt in two waves: the first stage comprises the immediate sensation of pain, whereas the second stage involves a mental reaction to the pain, or suffering. Stone suggested that mindfulness meditation interrupts the habitual movement from sensation to mental reaction, creating a space between these stages. This space allows us to fully experience each emotion; that is, we can permit each feeling to unfold and pass through our minds rather than remain in an intensifying cycle of reactivity.

Stone’s (2006) two-wave theory fits soundly within Melzack and Wall’s (1965) Gate Control Theory of pain. Their hypothesis regarding nociception (transmission of neural impulses pertaining to stimuli that cause tissue damage or potentially could, if
maintained) quickly became, and remains, the most comprehensive theory of pain modulation to date (Sufka & Price, 2002). Under this theory, nociceptive information is regulated by the spinal cord dorsal column system. Specifically, the substantia gelatinosa (a system of interneurons within the spine’s dorsal grey matter) acts as a gate control system by modulating impulses before they reach T cells. T cells are sensory neurons of the spinal cord that project and convey the nociceptive information up to the brain, thus activating neural mechanisms that create the perceptive experience. When modulated, the nociceptive information may result in hyperalgesia (increased sensitivity to pain) or hypoalgesia (decreased sensitivity to pain). The information that leads to spinal transmission can come in two forms: large-diameter A-fibers that are myelinated and transmit impulses at 5-30 meters/second, or small-diameter C-fibers that are non-myelinated and transmit impulses at a much slower 0.3-2.0 meters/second. A-fibers excite substantia gelatinosa neurons, resulting in hypoalgesia; however, C-fibers inhibit substantia gelatinosa neurons and result in hyperalgesia. Therefore, one can “close the gate” by increasing the A-fiber activity, thereby decreasing sensitivity to pain. This can be accomplished by activities in affective and cognitive domains that send descending signals from the brain to the spinal cord, inhibiting the sensory dimension of the pain experience (Melzack & Wall, 1965, 1982). For example, one might try altering his or her interpretations of, or emotional reactions to, the pain experience so that a message of pride or nostalgia is sent. Mindfulness practice that focuses on acceptance of reality as it is has become a principal method of modifying these cognitive and affective domains.

Mindfulness and Chronic Pain
The early efforts of treating chronic pain with mindfulness practice, for example, utilized an intense, 1-year training program (Kabat-Zinn, Lipworth, & Burney, 1985; Kabat-Zinn, 1982). Initial results of this program, Mindfulness-Based Stress Reduction (MBSR), were promising, with patients reporting improvements in self-reported pain acceptance and physical functioning. A control group of 21 participants was treated with traditional methods in a pain clinic (including nerve blocks, transcutaneous electrical nerve stimulation, physical therapy, analgesics, and antidepressants) while a treatment group took part in the SR&RP (Stress Reduction and Relaxation Program, later called MBSR). The original program consisted of five consecutive cycles of 10-week meditation training sessions, comprising a total of 50 weeks. Participants in the SR&RP participated in ten 2-hr courses on mindfulness practice and were required to practice 45 minutes of mindfulness per day for 6 days of the week. Additionally, patients were instructed on how to practice Hatha Yoga, emphasizing mindfulness, as a form of meditative exercise.

Pain indices including the McGill-Melzack Pain Rating Index (PRI; Melzack, 1975), Body Parts Problem Assessment Scale (BPPA; Kabat-Zinn, 1983), Table of Levels of Interference (TLI: Kabat-Zinn, 1982), and the Body Pain Map (BPM; Kabat-Zinn, 1982) measured present-moment pain, perception of problem body parts, the effect of pain on activities of daily living, and pain distribution/intensity/frequency, respectively. Participants were also assessed affectively using the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971), as well as with the Hopkins Symptom Checklist (SCL-90-R; Derogatis, 1977) that measured nine symptom dimensions including depression, anxiety, and psychoticism. Results revealed significant reductions
in group mean values of the PRI (58%), BPPA (29%), and TLI (30%). Additionally, 48% of patients showed moderate to great improvement on the BPM, as well as significant reductions in mood disturbance and psychological symptomatology (55% and 35% lower on mean scores on POMS and SCL-90-R, respectively). A more recently-developed version of Kabat-Zinn’s stress-reduction program involves 8 weeks of in-class training, daily homework assignments, as well as one full-day retreat (The Stress Reduction Program, n.d.). The current study will examine whether an even briefer version of mindfulness training can be effective.

The acceptance manifested in mindfulness can result in a number of positive outcomes relevant to the chronic pain population. For example, the practice of mindfulness is significantly correlated to improvements in physical (lower pain ratings), social (decreased negative effects of health problems on psychosocial interactions), cognitive (decreased distress and increased alertness), and emotional (decreased depression and anxiety) functioning in chronic pain patients (McCracken et al., 2007). Frequently practicing mindfulness is associated with less emotional vulnerability (negative affectivity, anxiety sensitivity; McKee, Zvolensky, Solomon, Bernstein, & Leen-Feldner, 2007). In addition, mindfulness is positively associated with increases in awareness of self and others (self-consciousness, empathy, attention to cognitive and affective dimensions of own experience, lack of social anxiety; Beitel, Ferrer, & Cecero, 2005), self-compassion (extending kindness and understanding to one’s self in instances of perceived inadequacy, failure, or suffering; Leary, Tate, Adams, Allen, & Hancock, 2007; Neff, 2003), and well-being (Wallace & Shapiro, 2006). These outcomes would be especially beneficial to an older adult population due to their higher prevalence rates of
chronic pain. According to Morone and Greco (2007), however, there is not yet sufficient evidence to conclude that various mind-body interventions reduce chronic pain in older adults, and more studies must be done with older adults. MBSR, for example, has been successfully taught to older adults, but treatment modifications and lack of replication necessitate additional research. Thus, the long-term aim of the current study is to expand upon early research on mindfulness and chronic pain by engaging older adults suffering from chronic pain in a cost- and time-efficient mindfulness program that enables them to live a more fulfilling life. The intention of the current study is to test the effectiveness of a mindfulness-based treatment that is administered over a significantly reduced time period and which, consequently, requires less time commitment from the participants. DBT Mindfulness skills training meets this demand.

Overview of DBT Mindfulness

Generally speaking, the practice of mindfulness meditation involves bringing nonjudgmental, moment-to-moment awareness to thoughts, sensations, and emotions as they immediately arise (Kabat-Zinn, 1982). It has become a treatment that emphasizes the ever-changing field of mental activity by embracing an indifferent acknowledgment (i.e., a mental flexibility) towards any perceptions, fantasies, memories, or feelings which enter a person’s awareness. Developing this sense of awareness is an integral part of Dialectical Behavior Therapy (DBT), specifically, the mindfulness skills (Linehan, 1993a).

DBT draws its theory from behavioral/cognitive-behavioral psychotherapy, dialectical philosophy, and Zen practice (which emphasizes the acceptance of reality as it is; Linehan, 1993a). The underlying tenet of DBT is to help patients find a balance
between acceptance and change, and it is designed to help patients build a life worth living. DBT is an empirically-supported therapy that has been developed for the treatment of Borderline Personality Disorder (BPD); however, the DBT skills have been shown to be effective for a variety of other diagnoses, including eating disorders, substance abuse, and depression in an adult population over the age of 60 (Lynch, Trost, Salsman, & Linehan, 2007). Although this treatment was not originally designed to treat chronic pain, it provides a brief mindfulness intervention that may produce similar effects of longer mindfulness-based treatments for chronic pain (e.g., Kabat-Zinn et al., 1985; Kabat-Zinn, 1982; McCracken & Eccleston, 2005).

The mindfulness skills module in DBT emphasizes a synthesis of emotional and rational thinking into a “wise mind,” which is designed to enable participants to reach a more balanced state of being. For example, a person with chronic pain may have an extreme emotional reaction to their pain and say, “I cannot stand it anymore!” This style of thinking is labeled “emotion mind” and may actually increase the person’s suffering. At the other end of the spectrum, attempts at an emotionless, logical approach to the pain would invalidate the person’s physical and emotional experience. A “wise mind” approach to the pain may be to both accept the pain and the troubles that it brings and to use logic to adjust one’s life to better accommodate the pain.

The “wise mind” approach is supplemented with six additional mindfulness skills which are divided into the “what” skills and the “how” skills. The three what skills are observe, describe, and participate. These skills are the actions of mindfulness. For example, a patient may be asked to observe the sensation of their breath moving in and out of their body for two minutes. During this time, the patient is asked to not attempt to
change the quality or pace of their breathing but, if this happens, they are asked to simply notice this change. Thus, by practicing controlling attention in a particular manner, in this instance, on breathing, the person can subsequently apply this attentional control toward other activities while feeling pain. The three how skills are the adverbs of mindfulness and they are non-judgmentally, one-mindfully, and effectively. Participants in DBT mindfulness skills groups are encouraged to non-judgmentally perceive their experiences, such as pain, and their entire world, just as it is. For example, an older veteran with chronic pain might experience judgmental thoughts regarding his or her condition and status as an American soldier, such as, “I am a weakling and a disappointment.” The goal of the nonjudgmental skill is to help a client reframe these ideas to more objective, fact-based statements, such as, “I am not as strong as I used to be, but I still respect my service to my country.”

Because of the time-commitment barrier described by Austrian, Kerns, and Reid (2005), it is suggested that the brevity of DBT mindfulness makes it an optimal course of treatment for chronic pain patients. The mindfulness module is typically taught over the course of two weeks in two 2-hr sessions (Linehan, 1993b). For the purposes of the current study, a third session will be added to provide enough time so that additional DBT skills can be covered. These skills are theoretically linked to the treatment of chronic pain. For example, Radical Acceptance is a skill that teaches participants how to completely accept reality just as it is, regardless of what painful circumstances or sensations come their way. This skill represents fully opening to the experience of life and is particularly applicable to the treatment of chronic pain. For example, a patient may attempt to open his mind to the possibility that his lower back pain is a part of reality
that cannot always be avoided in order to prevent him from the suffering that comes from rejecting the inevitability (i.e. reality) of his pain. In other words, experiencing pain in life is inevitable, but suffering can be reduced by acceptance of pain. It is for this reason that an acceptance measure is included in the current investigation (Chronic Pain Acceptance Questionnaire; McCracken, Vowles, & Eccleston, 2004; see Appendix A). In addition to the Radical Acceptance skill, participants will be taught the Pros and Cons skill in order to identify and discuss both the benefits and setbacks of having chronic pain.

The treatment attempts to help patients achieve three objectives: to increase their control over awareness, to achieve a “wise” emotional and rational integration as described above, and to experience a sense of connectedness with themselves and the world around them (Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006). All of the DBT skills listed above are cognitive-behavioral in nature; that is, they are designed to modify clients’ attitudes, beliefs, feelings, behaviors, and thoughts that might impact their pain experience (Yonan & Wegener, 2003). Stone (2006) suggested that mindfulness meditation interrupts the habitual movement from sensation to mental reaction, creating a space between these stages. Thus, as the examples above demonstrate, the DBT skills can be implemented as cognitive/behavioral interruptions that break up a patient’s routine thought processes by sending novel signals from the brain to the spinal cord that inhibit the sensory dimension of pain.
Chapter II

Rationale and Hypotheses

Chronic pain is an affliction that lacks apparent biological evidence and has persisted beyond the normal tissue healing time of three months (Harstall & Ospina, 2003). Harstall and Ospina's (2003) meta-analysis consisting of 13 published studies revealed a 35.5% rate of prevalence for chronic pain in the general population, and it is reported that rates among older adults are as high as 50.2%. The financial burden caused by greater healthcare consumption is particularly unfortunate for this population of older adults, many of whom have begun to retire from their careers. Due to the unremitting nature of the condition, patients with chronic pain pay an average price of $35,651 per year at pain treatment facilities (Turk & Burwinkle, 2005). Furthermore, the total annual cost of chronic pain in the United States is estimated at $150-215 billion. Of the 3.6 million older Americans who live below the poverty level, financial deficits are particularly troublesome for older veterans, as demonstrated by their significantly increased rates of unemployment compared to nonveteran peers (Greenberg, 2005; United States Department of Labor, 2004).

Despite the epidemic levels of chronic pain among older adults, the treatment options are severely lacking. The standard treatments for chronic pain (including medication, surgery, spinal cord stimulators [SCSs], implantable drug delivery systems
[IDDSs], and local anesthesia) suffer from one or more of three main problems: 1) high cost, 2) low effectiveness, and 3) high time commitment. As a result of these issues, older veterans often do not get the treatment they need.

Kabat-Zinn (1982) developed a mindfulness treatment for chronic pain called Mindfulness-Based Stress Reduction (MBSR). According to Kabat-Zinn (1982), mindfulness meditation can help a client consciously self-regulate this attentional focus to alleviate suffering. Results for MSBR illustrate improvements in self-reported pain acceptance and physical functioning; however, it may be possible to supplement treatment as usual with a modified mindfulness program over a shorter period of time to achieve comparable outcomes.

Dialectical Behavior Therapy (DBT) is a psychological treatment originally designed for clients with Borderline Personality Disorder (BPD), but its skills have demonstrated effectiveness in randomized, controlled trials for clients with other diagnoses as well (Lynch et al., 2007). One skill set that DBT utilizes is a mindfulness training component that teaches clients to let go of attachments, find the middle path between extremes, and become more fully participatory in the present moment without judgment or effort to change what is. Because of the results that MBSR exhibits with chronic pain patients, coupled with the versatility of DBT skills, there is reason to believe that DBT mindfulness training would have similar outcomes on chronic pain patients. Therefore, it is proposed that three sessions of Linehan’s (1993b) DBT mindfulness skills training may also provide powerful relief to patients with chronic pain. Specifically, it is hypothesized that:
1. When comparing a standard treatment as usual group of older veterans with a treatment as usual plus DBT group, there will be a significant treatment by time interaction effect on the Short-Form McGill Pain Questionnaire total pain score such that, over the course of treatment and follow-up, the DBT group will have significantly greater reductions in pain ratings as compared to the control group.

2. When comparing a standard treatment as usual group of older veterans with a treatment as usual plus DBT group, there will be a significant treatment by time interaction effect on the physical health composite scores (PCS) on the RAND 36-Item Health Survey such that, over the course of treatment and follow-up, the DBT group will have significantly greater increases on PCS as compared to the control group.

3. When comparing a standard treatment as usual group of older veterans with a treatment as usual plus DBT group, there will be a significant treatment by time interaction effect on the mental health composite scores (MCS) on the RAND 36-Item Health Survey such that, over the course of treatment and follow-up, the DBT group will have significantly greater increases on MCS as compared to the control group.

4. When comparing a standard treatment as usual group of older veterans with a treatment as usual plus DBT group, there will be a significant treatment by time interaction effect on the Chronic Pain Acceptance Questionnaire such that, over the course of treatment and follow-up, the DBT group will have significantly greater increases on the total score as compared to the control group.
A manipulation check of the independent variable will ensure that participants in the treatment group become more mindful after their training. Therefore, the 15-item Mindful Attention Awareness Scale (MAAS) will be used to assess participants on cognitive, emotional, physical, interpersonal, and general mindfulness domains.
Chapter III

Method

Participants

The 50 male and female participants of this study will be aged 50 and over. All participants will have a diagnosis of chronic pain. Participants will be excluded if they are currently engaged in other behavioral treatments for chronic pain, and will be recruited from a VA Medical Center’s (VAMC) Pain Clinic because of the high prevalence of older veterans seeking care at this facility. This facility runs two primary programs, the first being the Pain Mastery Program, a 6-week intervention designed to increase self-management of chronic pain, decrease awareness of pain, reduce the impact of stress on pain, and enhance wellness behaviors. This program includes an educational group and a relaxation training component that meets for one 1.5-hour session per week. The second program implemented by the VAMC is the Intensive Pain Rehabilitation Program, or IPRP. This program is more intensive than the Pain Mastery Program, running two days a week, from 8:30am to 2:00pm, for four weeks. The IPRP includes physical therapy, psychotherapy, education groups, relaxation training, and group therapy, and is run by the entire pain care team that includes staff from Psychiatry, Nursing, Psychology, Medicine, and Physical Therapy. Due to both programs’ popularity, there are waitlists for admission. Participants for the current study will be
recruited from these waitlists, which typically consist of 10-15 patients at a given time, as well as from posted information flyers (see Appendix B).

A power analysis was conducted using the G*Power 3 program (Faul, Erdfelder, Lang, & Buchner, 2007), which is based on Cohen’s (1988) power tables. Based on previous studies of mindfulness interventions for the treatment of chronic pain (Kabat-Zinn et al., 1985; Kabat-Zinn, 1982; McMillan et al., 2002; McCracken & Eccleston, 2005), a medium effect size is expected. Power was analyzed for the main analysis which is a mixed model analysis of variance (MMANOVA) that includes both a within and a between subjects factor. Using an alpha of .05 in order to obtain an estimated power of .80, data from 28 individuals (i.e., 14 per condition) will need to be collected in order to detect a medium effect size (i.e., Cohen’s $f$ of .25). The current investigation will enroll up to 50 participants (25 per condition) to ensure the adequate sample of treatment completers for statistical analysis, should there be any dropout. Recruitment will continue until at least 14 people in each condition have completed Time 1 and Time 2 measurements.

Measures

**Short-Form McGill Pain Questionnaire.** The Short-Form McGill Pain Questionnaire (SF-MPQ) will measure pain from the previous week (see Appendix A). The MPQ is the most frequently used and referenced pain assessment measure worldwide (McGill Pain Questionnaire, n.d.). This survey uses three types of questions to assess pain (Melzack, 1987). The first type asks participants to describe their pain in the last week. Subsequently, the patients use a 4-point scale ranging from none (0) to severe (3) to rate 15 sensory and affective descriptors (11 sensory, 4 affective), such as “throbbing”
and “tiring-exhausting.” These pain scores are derived from the sum of intensity ratings for each descriptor (0 = none, 1 = mild, 2 = moderate, or 3 = severe). Sensory pain (SP) is measured by descriptors 1-11, and scores range from 0 to 33. Affective pain (AP) scores range from 0 to 12 and are measured by descriptors 12-15. A total score for the SF-MPQ (0-45) is generated by summing all 15 of the rank orders. Next, participants are asked to indicate their pain’s intensity on a visual analogue scale (VAS), which is a horizontal line that indicates either no pain, worst pain, or somewhere in between. Participants are asked to mark the horizontal line to reflect their pain in the last week. The VAS is scored by measuring the distance in millimeters from 0 to their mark. Next, participants are asked to make a check beside a word from a list that describes their present pain intensity (PPI): no pain, mild, discomforting, distressing, horrible, or excruciating. While only the total pain score of the SF-MPQ will be utilized in the current investigation, these other pain descriptions provide an overall pain index for each patient.

The scores on the SF-MPQ correlate highly with the full version of the MPQ, and the SF-MPQ has been shown to demonstrate changes over time (treatment) in a manner similar to the standard form (Melzack, 1987; Dudgeon et al., 1993). For example, Melzack demonstrated that total score pain ratings on the short and long form were significantly correlated before and after therapeutic interventions for musculoskeletal pain ($r = 0.93, p < 0.001$ before; $r = 0.70, p < 0.01$ after; $N = 10$), postsurgical pain ($r = 0.77, p < 0.001$ before; $r = 0.88, p < 0.001$ after; $N = 27$), labor pain ($r = 0.81, p < 0.001$ before; $r = 0.92, p < 0.001$ after; $N = 20$), and postsurgical pain (French version; $r = 0.91, p < 0.001$ before; $r = 0.80, p < 0.001$ after; $N = 13$). Chen, Dworkin, Haug, and Gehrig
(1989) demonstrated that the SF-MPQ had a high degree of consistency across five studies using the cold pressor task. For example, MPQ total pain scores showed similarity across all five studies (Study I, 25.9±12.3; Study II, 26.8±12.3; Study III, 28.5±13.3; Study IV, 27.6±11.6; Study V, 25.9±12.4). Furthermore, Love, Leboeuf, and Crisp (1989) demonstrated high test-retest correlations for the MPQ's categories of pain descriptors ranging from 0.29 to 0.83 with a median of 0.48.

**RAND 36-Item Health Survey.** The RAND 36-Item Health Survey (RAND-36) is a comprehensive short-form generic profile measuring health-related quality of life (see Appendix A). It yields eight scale scores (physical functioning, role limitations due to physical health, role limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain, and general health) and two summary scores (physical and mental health) for which higher scores indicate higher health-related quality of life (Hays & Morales, 2001). The physical health composite score (PCS) is comprised of the summation of the physical functioning, role limitations due to physical health, pain, and general health scale scores, whereas the mental health composite score (MCS) is comprised of the summation of the role limitations due to emotional problems, energy/fatigue, emotional well-being, and social functioning scale scores. Scoring is a two-step process, beginning with recoding preselected items using a scoring key so that all scores represent a more favorable health state as they get higher (RAND Health, 2008; see Appendix A). The second step involves averaging the recoded scores to create the eight scale scores as directed.

The RAND-36 is a widely-used measure of health-related quality of life. Investigations of its reliability and validity are promising (VanderZee, Sanderman,
Heyink, & de Haes, 1996). In terms of construct validity, all of the scales significantly correlate with intercorrelations ranging from 0.31 to 0.71. Furthermore, with only two exceptions, correlations between corresponding scales on the RAND-36 and the Nottingham Health Profile (NHP) and Dartmouth COOP Functional Assessment Charts/WONCA (COOP/WONCA) were all higher than noncorresponding scales (e.g., RAND-36 physical functioning and NHP physical mobility = 0.69; RAND-36 physical functioning and COOP/WONCA physical fitness = 0.52). According to RAND Health (2008), internal consistency of the different scales is high, with the following alpha values for each of the eight scale scores: physical functioning (0.93), role limitations due to physical health (0.84), role limitations due to emotional problems (0.83), energy/fatigue (0.86), emotional well-being (0.90), social functioning (0.85), pain (0.78), and general health (0.78). The RAND-36 also has published norms, reported as T scores that have a mean of 50 and standard deviation of 10 (Ware, Kosinski, & Keller, 1994). An adult male sample’s (n = 1055) average T scores and standard deviations are 51.05 (9.4) and 50.73 (9.6), respectively. A sample of adult females (n = 1412) had an average PCS of 49.07 and standard deviation of 10.4, and an average MCS of 49.33 and standard deviation of 10.3. Internal reliability coefficient alphas for the PCS and MCS are 0.93 and 0.88, respectively.

**Chronic Pain Acceptance Questionnaire.** The 20-item Chronic Pain Acceptance Questionnaire (CPAQ) will be used to measure acceptance of pain (McCracken, Vowles, & Eccleston, 2004; see Appendix A). The CPAQ is comprised of two subscales: activity engagement (assessing the tendency to perform activities with pain present) and pain willingness (assessing the relative absence of attempts to control
or avoid pain). Each item is rated on a Likert-type scale ranging from 0 (never true) to 6 (always true). Activities engagement scores are calculated by adding items 1, 2, 3, 5, 6, 8, 9, 10, 12, 15, and 19, whereas pain willingness scores are calculated by reverse scoring (and then summing) items 4, 7, 11, 13, 14, 16, 17, 18, and 20. A total score is calculated by summing the activities engagement and pain willingness scores. Internal consistency values of 0.78 (pain willingness) and 0.82 (activity engagement) have been demonstrated for the CPAQ. Additionally, its validity as a measure of acceptance of pain has been supported with significant correlations with measures of avoidance, distress, and daily functioning. McCracken et al. divided scores from the Beck Depression Inventory (BDI), Pain Anxiety Symptoms Scale (PASS), and Sickness Impact Profile (SIP) into three variable groups (medically oriented variables, physical and work functioning, and emotional/social functioning issues) and examined their correlations to subscales of the CPAQ. For example, CPAQ activity engagement and pain willingness both correlated positively with pain-related anxiety as measured by the emotional and social variable group ($r = -0.51$, $r = -0.63$, $p < 0.001$, respectively).

**Mindful Attention Awareness Scale.** Finally, a manipulation check of the independent variable will ensure that participants in the treatment group become more mindful after their training. The Mindful Attention Awareness Scale (MAAS) will be used to assess participants on cognitive, emotional, physical, interpersonal, and general mindfulness domains (Brown & Ryan, 2003; see Appendix A). This self-report mindfulness measure contains 15 items presented on a six-point Likert scale ranging from 1 (almost always) to 6 (almost never). The MAAS has a total score, which is the sum of the 15 items. Higher scores indicate a greater degree of mindfulness. Respondents are
asked to rate items in terms of what “really reflects” their experience, rather than what they believe their experience should be, in order to reduce social desirability. The MAAS correlates positively with a variety of self-report instruments that examine self-awareness. The Trait Meta-Mood Scale (TMMS) measures attention to feelings, clarity of emotional experience, and repairing unpleasant mood states (Salovey et al., 1995). The MAAS correlated with overall emotional awareness as examined by the TMMS at .46 ($p < .001$), attention ($r = .19, p < .001$), clarity ($r = .49, p < .0001$), and repair ($r = .37, p < .0001$). Coefficient alpha ranges from .82 in an undergraduate sample ($N = 327$) to .87 in a general adult sample ($N = 239$), and temporal stability was assessed with an undergraduate sample over a four-week period ($N = 60$, ICC = .81, $p < .0001$; Brown & Ryan, 2003). The MAAS also correlates to various measures of well-being, such as positive affect on the Positive and Negative Affect Schedule ($r = .30, p < .0001$; PANAS; Watson, Clark, & Tellegen, 1988).

**Procedure**

This study will seek approval from the University of Medical Institutional Review Board (as required by the VAMC) as well as the University Institutional Review Board. The study will follow the subsequent protocol:

1. Information flyers will be posted in and around the VAMC with phone numbers attached so that potential participants may call for more information.

2. Waiting lists will be obtained through correspondence with VAMC staff and participants will be recruited from these lists.

3. All potential participants’ charts will be screened before acceptance into this study to ensure they are the appropriate age, have a diagnosis of chronic pain, and
are not engaged in other behavioral treatments for chronic pain. Demographic information for population description will also be collected from their charts.

4. Each potential participant will be contacted and recited a scripted invitation to participate in the study (please see Appendix C). If they agree, then an appointment with the potential participant will be set up to do the informed consent procedure and the first assessment appointment.

5. During the scheduled appointment, individuals will go through the informed consent procedure (see Appendix D) as well as commitment strategies and troubleshooting to increase the likelihood that they will attend each session. They will be provided with an information handout that they may keep (please see Appendix E).

6. After participants grant consent and are randomly assigned they will complete the first set of questionnaires (i.e., CPAQ, SF-MPQ, RAND-36, & MAAS, see Appendix A). This is considered the Time 1, pre-treatment administration. The order of the questionnaires will be counterbalanced to control for fatigue effects.

7. All participants who consent to participate in the study will be randomly assigned by a coin flip to one of two conditions, (i.e., heads to treatment and tails to control) thus creating a randomized, controlled research sample.

8. Following completion of questionnaires, participants will be informed what they will be asked to do after the current appointment. Participants in the control group will be told that they will be asked to fill out the questionnaires again at two more times (i.e., approximately three weeks after the current appointment at Time 2, and approximately 7 weeks after the current appointment at Time 3).
Individuals in the treatment group will be given information about the treatment group including time, place, and duration of the DBT mindfulness skills training appointments. They will be informed that they will be asked to complete the questionnaires after completion of the last skills training appointment in approximately 3 weeks (i.e., Time 2) and four weeks after the final appointment (i.e., Time 3).

9. To ensure confidentiality, all participants will be assigned an identification number. All data and documents connecting patient information will be encoded in a form that uses only this number. A tracking form that connects participants’ names and identification numbers will be maintained only for the purposes of collecting measures at different time points. This form will be kept in a locked filing cabinet behind a locked door and will be destroyed at the study’s time of completion.

10. Treatment-group participants will meet for 2.5 hours one day per week for three consecutive weeks and participate in the intervention. Participants in both conditions will continue with typical care at the VAMC Pain Clinic.

11. At the time of conclusion for the third treatment session, participants in the treatment condition will complete the second set of questionnaires (Time 2; see Appendix A), with the order counterbalanced to control for fatigue effects. At the same time, the questionnaires will be sent via mail or administered in person to the control-group participants for completion. Participants in both conditions will be paid $10 once these sets of questionnaires have been received.
12. One month later, all participants will be mailed the final set of questionnaires (Time 3; see Appendix A), placed in counterbalanced order to control for fatigue effects. All participants will be paid $10 once these sets of questionnaires have been received.

**Intervention.** The treatment condition will undergo three weeks of Linehan’s (1993b) mindfulness skills training, a specific component of Dialectical Behavior Therapy (DBT). Linehan’s method emphasizes a synthesis of emotional and rational thinking into a “wise mind,” which is designed to enable participants to reach a more balanced state of being, as well as to non-judgmentally perceive their pain, and their entire world, just as it is (Linehan, 2003). The treatment attempts to help patients achieve three objectives: to increase their control over awareness, to achieve a “wise” emotional and rational integration as described above, and to experience a sense of connectedness with themselves and the world around them (Lynch et al., 2006). Although this treatment was not originally designed to treat chronic pain, it provides a brief mindfulness intervention that may produce similar effects of longer mindfulness-based treatments for chronic pain (Kabat-Zinn et al., 1985; Kabat-Zinn, 1982; McCracken & Eccleston, 2005). Sessions will be held once per week for 2.5 hours each occurring over the intervention period. The focus of these sessions will be to instruct participants on how to consciously self-regulate their attentional focus to alleviate suffering. A layout of the daily plan for these sessions can be found below. Please also see Appendix F for sample handouts from Marsha Linehan’s published treatment manual (Linehan, 1993b). The current investigation will utilize an updated version of these handouts as permitted by Marsha Linehan; however, due to the fact that they are not yet published, they cannot be included
in this document. As part of the skills training experience, participants will be asked to
engage in mindfulness daily, practicing mindfulness both in group meetings and also
completing homework assignments privately. The control condition will continue with
typical care at the VAMC Pain Clinic. As previously mentioned, commitment strategies
and troubleshooting at the initial meeting will increase the likelihood that group members
will attend every session. In the event that a group member is not present at the
beginning of the session, staff from the group will call them in order to encourage them
to attend. If a patient misses an entire session, analyses will be conducted to examine the
effects, if any, of missing data.

DBT Skills Group. The first day of the intervention will begin with
introductions. This will be followed by a brief explanation of mindfulness and a review
of confidentiality, group format, and group guidelines. Group members will be
encouraged to get to know one another, especially in this initial session. Participants will
then learn the Body Scan, a mindfulness technique that teaches the practice of
sequentially noticing and attending to each part of one’s body. Participants will practice
the Body Scan and be oriented to its daily practice. Following a brief break, group
members will learn the Mindfulness “Whats and Hows” skills and be given a homework
assignment (practice the Body Scan every day, complete MindfulnessWhats and Hows
worksheet).

The second day of the intervention will begin with a group practice of the Body
Scan and homework review of the MindfulnessWhats and Hows worksheet. Each group
member will be given time to share his or her experiences with the homework. The other
group members will be encouraged during this time to provide feedback and
encouragement. During the homework review, troubleshooting will specifically target issues participants experienced with their homework and engage them in personalized behavioral problem-solving from which all group members can learn. Following a brief break, participants will learn the “Radical Acceptance” skill. Next, they will be given a homework assignment (practice the Body Scan every day, complete the Radical Acceptance worksheet), and provide observations on their experience in the day’s group.

The final day of the intervention will begin with the Body Scan and proceed with homework review of the Radical Acceptance worksheet. Following a brief break, participants will learn the “Pros and Cons” skill and examine the benefits and setbacks to having a diagnosis of chronic pain. Next, the participants’ motivation to continue their mindfulness practices will be targeted, and troubleshooting will help clients manage potential impediments to continued practice.
Chapter IV

Proposed Analyses

A two-way, mixed-model analysis of variance (MMANOVA), which combines one independent samples factor and one correlated groups factor, will be used to evaluate the efficacy of the mindfulness intervention. These types of designs are called mixed-model ANOVA's because they involve a combination an independent samples factor and a correlated groups factor. The MMANOVA will test for significant differences on the scales from pre to post treatment in both the treatment and control groups, including the follow-up at Time 3. Thus, the MMANOVA will examine changes within each group over the three repeated administrations of the dependent variable. Additionally, the MMANOVA will assess for significant differences in the amount of pre-post change between groups. Therefore, the MMANOVA will investigate an interaction that takes place between condition and time.

Conclusion and Limitations

This study aims to improve upon existing treatments by testing if brief mindfulness training will improve chronic pain in older veterans. Compared to the treatment as usual group, participants who engage in the daily mindfulness skills practice will likely have significantly greater reductions in pain ratings and in the impact of health problems on daily functioning. Generalizability will be limited based on the geographic,
demographic, and historical limitations of the VAMC sample. Furthermore, the current investigation is being conducted within the context of treatment as usual, which may contaminate the results. For instance, there may be wide variability in the other treatments that participants are receiving. However, both of these issues are being addressed through random assignment. Finally, due to the restraints of the current project, follow-up is limited to one month. Additional follow-up investigation may be necessary in the future. Regardless of these limitations, however, the current results may strengthen the case that brief mindfulness training can significantly and positively influence the lives of older adults who suffer from chronic pain when added to treatment-as-usual.
References


Appendix A

Instruments Used

The Chronic Pain Acceptance Questionnaire (CPAQ) is protected by copyright so it is not reproduced in this document. This measure is available through Elsevier B.V. at www.elsevier.com/locate/pain.

The Short-Form McGill Pain Questionnaire (SF-MPQ) is protected by copyright so it is not reproduced in this document. This measure is available through McGill University at http://www.mcgill.ca/.

The RAND 36-Item Health Survey (RAND-36) is protected by copyright so it is not reproduced in this document. This measure is available through the RAND Corporation at http://www.rand.org/health/surveys_tools/mos/mos_core_36item.html.

The Mindful Attention Awareness Scale (MAAS) is protected by copyright so it is not reproduced in this document. This measure is available through the American Psychological Association at http://www.apa.org.
Difficulties with chronic pain?

If you are a veteran over the age of 50, READ ON!

- Do you have pain that just won’t seem to go away?
  - Have you lost hope for improvement?
- Do you feel helpless about what to do for your pain?
- Does your pain medication fail to get rid of your pain?
- Are you looking for a new, non-surgical, non-invasive, treatment for your chronic pain that is free of charge?

If you answered YES to any of the questions above, you may be eligible for our study on CHRONIC PAIN.

To inquire about our research program, in which you will receive $20, please call:

[Principle Investigator]
[University]
[phone number]
Appendix C

Script for Telephone Call

“Hello. My name is [Principle Investigator] and I am a doctoral student from [University] who works at the [location] VA Hospital. How are you? I am conducting a study through the Pain Clinic at the VA to demonstrate the effectiveness of a way to treat chronic pain. This treatment does not require you to have any surgeries or take any medications in addition to the ones you might already take. If you choose to participate you will be asked to complete some brief questionnaires on three occasions. You will be given $20 to compensate you for your time. In addition, individuals who choose to participate will be randomly assigned to one of two groups. In one group individuals will continue with their usual treatment for chronic pain. In the second group individuals will receive three group treatment sessions in addition to their usual treatment. This additional treatment will be provided free of charge. The [location] area has never utilized this treatment and you would be a pioneer in a group of people that lead the way in helping veterans with their chronic pain across the nation. Participation is completely voluntary. Do you have any questions? Are you willing to participate? If so, let’s schedule a time to for us to meet.
Appendix D

VA Research Consent Form

<table>
<thead>
<tr>
<th>VA Department of Veterans Affairs</th>
<th>VA RESEARCH CONSENT FORM</th>
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<tbody>
<tr>
<td>Subject Name:</td>
<td>Date:</td>
</tr>
<tr>
<td>Title of Study:</td>
<td>Effects of Dialectical Behavior Therapy Mindfulness Skills Training on Older Veterans with Chronic Pain</td>
</tr>
<tr>
<td>Principal Investigator:</td>
<td>VAMC:</td>
</tr>
<tr>
<td>Consent Version Date:</td>
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Sponsor Name:

IRB Study #

INVESTIGATOR INFORMATION:

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<th>Principal Investigator Name</th>
<th>Telephone Number</th>
<th>24 hr Emergency Contact</th>
</tr>
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INTRODUCTION:

Before you agree to participate in this research study, it is important that you be told the purpose, procedures, benefits, risks, discomforts, and precautions of the research. You should also be told what alternative procedures are available to you if you do not participate in the research study.

Your participation in this research study is entirely voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw from the study at any time without penalty. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without unfairness to you or your medical care. We do not promise that you will receive any benefits from this study.

This informed consent document is a brief written summary of what your study doctor is telling you. Be sure to ask questions while you read this if there is anything that you do not understand.

WHY IS THIS RESEARCH BEING DONE?

The purpose of this research study is to test the usefulness of treatments for chronic pain, including a skills training group, and see what affects (good and bad) they have on you and your chronic pain.

WHY HAVE YOU BEEN ASKED TO TAKE PART IN THIS RESEARCH STUDY?

You are being asked to take part in this research study because you are over 50 years of age and you have been diagnosed with chronic pain.

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HOW LONG WILL YOU BE IN THE RESEARCH STUDY?
You will be asked to participate in the study for approximately four months. There will be four visits involved during this time.

The researcher may decide to take you off this research study at any time. Reasons for such an instance may include the following: if it is in your medical/psychological best interest, if your condition worsens.

You may withdraw from the study at any time. If you decide to stop participating in the study, we encourage you to talk to the researcher and your regular doctor first so that stopping can be done safely. Another reason to tell your doctor that you are thinking about stopping is to discuss what follow-up care and testing could be most helpful to you.

You may be contacted in the future by representatives of the University of who are interested in asking you survey questions about your participation in this research study. If you choose to participate in the survey, your responses will be used for quality assurance purposes only.

WHO IS CONDUCTING THE RESEARCH STUDY?
This study is sponsored by the Department of Psychology.

The study is directed by the researcher at the VA Medical Center. Medical supervision for this study at the VA is provided by Dr.

HOW MANY PEOPLE WILL TAKE PART IN THE RESEARCH STUDY?
About 50 people will take part in this study at the VA Medical Center.

I have received a copy of this consent form.

Page 2 of 7
# Mindfulness Skills Training and Chronic Pain

**VA Department of Veterans Affairs**

<table>
<thead>
<tr>
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<th>Date:</th>
</tr>
</thead>
</table>

**Title of Study:** Effects of Dialectical Behavior Therapy Mindfulness Skills Training for Older Veterans with Chronic Pain

**Principal Investigator:**

**Current Version Date:** 9/2/2009

## WHAT IS INVOLVED IN THE RESEARCH STUDY?

You will be assigned to one of two study groups. In one study group, you will continue with your usual care for chronic pain. In the second study group, in addition to your usual care, you will be asked to participate in an additional mindfulness skills training group. Mindfulness is a mental state that involves concentrating your awareness on your own thoughts, feelings, behaviors, and motivations. These meetings will entail group discussion, mindfulness practice, and the completion of homework assignments pertaining to mindfulness. You will be "randomized" into either one of the study groups. Randomization means that you are put into a group completely by chance. It is like flipping a coin.

If you take part in this study, you will have the following tests and procedures:

- You will be asked to complete The Short-Form McGill Pain Questionnaire (SF-MPQ), which will measure present-moment pain.
- Also, the RAND-36 will examine health-related quality of life
- The 15-item Mindful Attention Awareness Scale (MAAS) will be used to assess you on cognitive, emotional, physical, interpersonal, and general mindfulness domains.
- The 20-item Chronic Pain Acceptance Questionnaire (CPAQ) will be used to measure acceptance of pain.

You will be asked to complete the SF-MPQ, RAND-36, MAAS, and CPAQ again after approximately three weeks in the study and a third time approximately two months after you begin the study.

## WHAT ARE THE RISKS AND DISCOMFORTS OF THE RESEARCH STUDY?

There may be unknown or unforeseen risks associated with study participation. Potential risks from participation in this research study are minimal but include possible fatigue, frustration, or discomfort during the interviews, questionnaires, or exam. You will be given more time as needed to reduce fatigue. You can choose to not answer any question that makes you uncomfortable.

## ARE THERE BENEFITS TO TAKING PART IN THE RESEARCH STUDY?

**VA Form 10-1086**

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I have received a copy of this consent form.

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**VA RESEARCH CONSENT FORM**
<table>
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<th>VA RESEARCH CONSENT FORM</th>
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</table>

**Subject Name: ___________________________**  
**Date: ___________________________**

**Title of Study:** Effects of Mindfulness-Based Interventions on Pain, Sleep, Anxiety, and Mood in Older Veterans with Chronic Pain

**Principal Investigator:** ___________________________  
**VAMC:** ___________________________

**Consent Version Date:** 9/7/2022

If you agree to take part in this research study, there may not be a direct medical benefit to you. We hope the information learned from this research study will benefit other patients with chronic pain in the future.

**WHAT OTHER CHOICES DO I HAVE?**

Instead of being in this research study, you have these options:

- The [program name]
- The [VAMC]

These programs may also benefit your chronic pain. Ask your physician for more information.

**HOW WILL INFORMATION ABOUT YOU BE KEPT PRIVATE AND CONFIDENTIAL?**

Every effort will be made to maintain the confidentiality of your study records. You will be assigned an identification number and all data will be encoded in a form that uses only this number. All data collected will be maintained only for the purposes of collecting measures at different time points. No identifying information will be stored, with the exception of the tracking form, which will be kept in a locked filing cabinet behind a locked door and will be destroyed at the study's time of completion by paper shredder. Only the principle investigator and his supervisors will have access to the data. Agents of the United States Food and Drug Administration, the University of [location], and the [VAMC] will be allowed to inspect sections of your medical and research records related to this study. The data from this study may be published; however, you will not be identified by name. Your identity will remain confidential unless disclosure is required by law.

**AVAILABILITY OF INFORMATION**

You will receive a copy of this signed consent form.

You will be told about any new information from this or other studies that may affect your health, welfare, or willingness to stay in the study.

**WHAT ARE YOUR COSTS TO BE IN THIS STUDY?**

There will be no charge for your taking part in this study.

**I have received a copy of this consent form.**

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Department of Veterans Affairs patients may be financially responsible for care at the Department of Veterans Affairs. Financial responsibility is individually determined based upon legislative criteria. Some veterans are required to pay co-payments for medical care and services; these co-payment requirements will continue to apply to medical care and services provided by the Department of Veterans Affairs that are not part of this study.

WILL YOU BE PAID TO PARTICIPATE IN THIS RESEARCH STUDY?

After completion of the final two sets of questionnaires, you will be given $20 to compensate for your time in completing them. $10 will be given after completing the second set, and $10 will be given after the final set.

WHAT ARE YOUR RIGHTS AS A PARTICIPANT?

You may choose either to take part or not to take part in this research study. If you decide to take part, you may decide to leave the study at any time. Leaving the study will not result in any penalty or loss of benefits to you. The investigators will tell you about new information that may affect your health, welfare, or willingness to stay in this study.

If you have questions about the study, you will have the chance to talk to one of the study staff or your regular doctor. Do not sign this form unless you have had the chance to ask questions and have received satisfactory answers.

Nothing in this consent form waives any legal rights you may have nor does it release the investigator, the sponsor, the institution, or its agents from liability for negligence.

WHO DO YOU CALL IF YOU HAVE QUESTIONS OR PROBLEMS?

If you have questions, concerns, or complaints about this research study or to report a research-related injury, please contact the researcher, MA, at

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<th>VA RESEARCH CONSENT FORM</th>
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<td><strong>Subject Name:</strong></td>
<td><strong>Date:</strong></td>
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</table>

**Title of Study:** Effects of Dialectical Behavior Therapy Mindfulness Skills Training on Elderly Veterans with Chronic Pain

**Principal Investigator:** VAMC

**Consent Version Date:** 9/7/2009

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Please call the University of Medical Institutional Review Board at (Monday - Friday 6 am to 5 pm) if you:

- Think the research has hurt you.
- Have general questions about giving consent or your rights as a research participant in this research study.
- Have questions, concerns, or complaints about the research.
- Cannot reach the research team or you want to talk to someone else.

To report complaints or concerns to an independent agency in an anonymous and confidential manner, please call the Research Compliance Hotline at 1-800-865-1547.

If you want to check to be sure this study is approved and the researchers are authorized to do this study, please contact the Department of Veterans Affairs Research Service at Information can also be found at the internet at http://www.

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**CONSENT TO PARTICIPATE IN A RESEARCH STUDY**

**STUDY TITLE:** Effects of Dialectical Behavior Therapy Mindfulness Skills Training on Elderly Veterans with Chronic Pain

**Sponsor Name:**

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**IRB Study #:**

**INVESTIGATOR INFORMATION:**

<table>
<thead>
<tr>
<th>Principal Investigator Name</th>
<th>Telephone Number</th>
<th>24 hr Emergency Contact</th>
</tr>
</thead>
</table>

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**SIGNATURES**

I have read or someone has read to me, this informed Consent Document which describes the purpose and nature of this research. I have had time to review this information and have been encouraged to ask questions. I have received answers to my questions. If I do not participate or if I discontinue my participation, I will not lose any benefits.

---

**I have retained a copy of this consent form.**

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**VA FORM 10-1086 April 1991**

Page 6 of 7
VA Department of Veterans Affairs

VA RESEARCH CONSENT FORM

Subject Name: ___________________________ Date: ___________________________

Title of Study: Effects of Dialectical Behavior Therapy Mindfulness Skills Training on Older Veterans with Chronic Pain

Principal Investigator: ___________________________

Current Version Date: ___________________________

I will not lose any legal rights if I discontinue. My participation in this research is completely voluntary. I give my consent to participate in this study. I have received (or will receive) a copy of this form for my records and future reference.

Participant: ___________________________ Date: ___________________________

WITNESS TO THE CONSENT PROCESS: ___________________________ Date: ___________________________

PERSON OBTAINING CONSENT:

I have reviewed this form with the participant and/or representative. An explanation of the research was given and questions from the subject were solicited and answered to the subject's satisfaction. In my judgment, the subject has demonstrated comprehension of the information.

Signature and Title of Person Obtaining Consent and Identification of Role in the Study: ___________________________ Date: ___________________________

VA FORM 10-1086 April 1991

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Appendix E

Information Handout

TO: Research Participants
FROM: Principle Investigator

Thank you for your participation in this research study. Please take a moment to review the following procedures in which you will be involved. Every person chosen for this study will be assigned to either a Treatment As Usual (TAU) group or a Treatment group. In the TAU group, you will continue with your usual care for chronic pain. In the second study group (Treatment group), in addition to your usual care, you will be asked to participate in an additional mindfulness skills training group. Mindfulness is a mental state that involves concentrating your awareness on your own thoughts, feelings, behaviors, and motivations. These meetings will entail group discussion, mindfulness practice, and the delegation of homework assignments pertaining to mindfulness. This Treatment group will meet for 2.5 hours, one day per week, for three weeks.

You will be "randomized" into either one of the study groups (Treatment or TAU). Randomization means that you are put into a group completely by chance. It is like flipping a coin. Regardless of which group you are assigned to, you will be asked to complete the following surveys once during an individual session with a researcher, again approximately 3-4 weeks later, and a third (and final) time one month after that:

- The Short-Form McGill Pain Questionnaire (SF-MPQ), which will measure present-moment pain.
- The RAND-36, which will examine health-related quality of life.
- The Mindful Attention Awareness Scale (MAAS), used to assess you on cognitive, emotional, physical, interpersonal, and general mindfulness domains.
- The Chronic Pain Acceptance Questionnaire (CPAQ), which will be used to measure acceptance of pain.

You will be paid $10 after completing the second set of questionnaires, and $10 after completing the third set. Participation in this study is voluntary, and you may quit at any time. If you have any questions regarding this research, please call [Principle Investigator], M.A. (phone number) or his supervisor, [Supervisor], Psy. D. (phone number). Thank you again for your participation in this research study.

Sincerely,

Principle Investigator
Appendix F

Skills Handouts

The Dialectical Behavior Therapy (DBT) skills handouts are protected by copyright so they are not reproduced in this document. These forms are available in the DBT Skills Training Manual, cited below

Chapter V: Dissertation

Abstract

Despite epidemic levels of chronic pain among older adults, treatment options are severely lacking. The standard treatments for chronic pain suffer from one or more of three main problems: 1) high cost, 2) low effectiveness, 3) high time commitment. Mindfulness treatments for chronic pain have been established and validated in older adult populations; the current study employed a randomized clinical trial to examine whether a briefer version of mindfulness training could be effective. This investigation evaluates the effectiveness of Dialectical Behavior Therapy (DBT) mindfulness skills training on pain management in a sample of 31 older adults. In contrast to the findings of some previous studies demonstrating decreased pain and increased mindfulness, acceptance of pain, and quality of life, no such effects were found in this study. The present findings were discussed to inform the development and application of mindfulness-based treatments for chronic pain.
Effects of Dialectical Behavior Therapy Mindfulness Skills Training on Older Adults with Chronic Pain

Chronic pain among older adults is a tremendous problem, with rates estimated as high as 35.5% (range of 10.1%-55.2%) in the general population according to Harstall and Ospina’s (2003) meta-analysis of 13 publications. The analysis also concluded that the prevalence of the most intense and severe chronic pain among adults is approximately 11%. Clinical definitions for pain vary significantly, as do distinctions between acute and chronic pain. The most widely-accepted method of making this distinction is to base it upon the duration of time since the onset of pain, most commonly designating chronic pain as a condition that has lasted for at least three or six months (Turk & Okifuji, 2001). For some individuals, the condition may also represent relatively low levels of underlying pathology that do not explain the pain’s presence and intensity. Nevertheless, chronic pain often originates with injury or common medical diagnoses such as rheumatoid arthritis, osteoarthritis, neuropathy, fibromyalgia, cancer, diabetes, and multiple sclerosis. Despite epidemic levels of chronic pain among older adults, standard treatment options are severely lacking. The current treatments for chronic pain (including medication, surgery, spinal cord stimulators [SCSs], implantable drug delivery systems [IDDSs], local anesthesia, and cognitive-behavioral interventions) suffer from one or more of three main problems: 1) high cost, 2) low effectiveness, 3) high time commitment. As a result of these issues, older adults often do not get the treatment that they need.
Cognitive-Behavioral Pain Treatment in Correctional Settings

Generally speaking, a major impediment for treating inmates with cognitive-behavioral interventions is the well-documented overrepresentation of learning and developmental disabilities in prison populations (Hayes, 1997; Hayes & Craddock, 1992; Noble & Coney, 1992). To manage issues related to intellectual ability, several previous DBT studies used intellectual ability as an exclusion criterion (e.g., Bohus et al., 2000; Linehan et al., 2006). In addition to issues related to intelligence, many incarcerated individuals struggle with mental health problems that interfere with their participation in cognitive-behavioral treatments (Gussak, 2009). These factors were considered as possible limitations to the current research.

Older adults who are prison inmates are met with additional challenges in treating their pain (Cohen, 2006). For example, pain patients within correctional settings are often denied access to pain medications, due in part to the generally contraband nature of narcotics but also an inmate’s unique personal history of abuse. Milano (2006) emphasizes the difficulty in distinguishing between inmates who have a pain treatment need and those who do not, and also contends that pain treatment options in prisons are limited. An exemplar of this deficiency is demonstrated in the Pain Control Management Guidelines for Worcestershire Prisons (NHS Worcestershire, 2008). This policy establishes traditional varieties of medications and exercises as the appropriate pain treatment methods; however, it fails to include any psychological treatment strategies (beyond providing general advice) as alternatives to pharmacological pain management. Therefore, the problems faced by older adults who suffer from chronic pain are exacerbated by additional issues related to their incarceration.
Mindfulness and Chronic Pain

As an alternative to traditional methods, the early efforts of treating chronic pain with mindfulness practice utilized an intense, one-year training program (Kabat-Zinn, Lipworth, & Burney, 1985; Kabat-Zinn, 1982). Initial results of this program, Mindfulness-Based Stress Reduction (MBSR), were promising, with patients reporting improvements in self-reported pain acceptance and physical functioning. A control group of 21 participants was treated with traditional methods in a pain clinic (including nerve blocks, transcutaneous electrical nerve stimulation, physical therapy, analgesics, and antidepressants) while a treatment group took part in the SR&RP (Stress Reduction and Relaxation Program, later called MBSR). The original program consisted of five consecutive cycles of 10-week meditation training sessions, comprising a total of 50 weeks. Participants in the SR&RP participated in 10 two-hr courses on mindfulness practice and were required to practice 45 minutes of mindfulness per day for six days of the week. Additionally, patients were instructed on how to practice Hatha Yoga, emphasizing mindfulness, as a form of meditative exercise. Kabat-Zinn’s stress-reduction program can now be taught in eight weeks but still involves in-class training, daily homework assignments, and one full-day silent retreat (The Stress Reduction Program, n.d.). The current study examined whether an even briefer version of mindfulness training can be effective.

The acceptance manifested in mindfulness can result in a number of positive outcomes relevant to the chronic pain population. For example, the practice of mindfulness is significantly correlated to improvements in physical (lower pain ratings), social (decreased negative effects of health problems on psychosocial interactions),
cognitive (decreased distress and increased alertness), and emotional (decreased depression and anxiety) functioning in chronic pain patients (McCracken et al., 2007). Frequently practicing mindfulness is associated with less negative affectivity and anxiety sensitivity (McKee, Zvolensky, Solomon, Bernstein, & Leen-Feldner, 2007). In addition, mindfulness is positively associated with increases in awareness of self and others (self-consciousness, empathy, attention to cognitive and affective dimensions of own experience, lack of social anxiety; Beitel, Ferrer, & Cecero, 2005), self-compassion (extending kindness and understanding to one's self in instances of perceived inadequacy, failure, or suffering; Leary, Tate, Adams, Allen, & Hancock, 2007; Neff, 2003), and well-being (Wallace & Shapiro, 2006). These outcomes would be especially beneficial to an older adult population due to their higher prevalence rates of chronic pain. According to Morone and Greco (2007), however, there is not yet sufficient evidence to conclude that various mind-body interventions reduce chronic pain in older adults, and more studies must be done with older adults. For example, Morone and Greco demonstrated that MBSR can be successfully taught to older adults, but emphasized that the specific treatment modifications for older adults and lack of replication necessitate additional research with geriatric samples. Likewise, Howells, Tennant, Day, and Elmer (2010) concluded in their meta-analysis that the psychological processes affected by mindfulness were relevant to reducing risk, alleviating distress, and facilitating coping in offender populations, but that there exists a paucity of reported controlled intervention studies.

Thus, the long-term aim of the current study was to expand upon early research on mindfulness and chronic pain by engaging older adults (offenders in a correctional setting) suffering from chronic pain in a cost- and time-efficient mindfulness program
that enabled them to live a more fulfilling life. The intention of the current study was to test the effectiveness of a mindfulness-based treatment that is administered over a brief time period.

**DBT Mindfulness Skills**

Generally speaking, the practice of mindfulness meditation involves bringing nonjudgmental, moment-to-moment awareness to thoughts, sensations, and emotions as they immediately arise (Kabat-Zinn, 1982). Mindfulness has become a treatment that emphasizes the ever-changing field of mental activity by embracing an indifferent acknowledgment (i.e., a mental flexibility) towards any perceptions, fantasies, memories, or feelings which enter a person’s awareness. Developing this sense of awareness is an integral part of DBT, specifically, the mindfulness skills (Linehan, 1993a). DBT draws its theory from behavioral/cognitive-behavioral psychotherapy, dialectical philosophy, and Zen practice (which emphasizes the acceptance of reality as it is; Linehan, 1993a). The underlying tenet of DBT is to help patients find a balance between acceptance and change, and it is designed to help patients build a life worth living. DBT is an empirically-supported therapy that has been developed for the treatment of Borderline Personality Disorder (BPD); however, the DBT skills have been shown to be effective for a variety of other diagnoses, including eating disorders, substance abuse, and depression in an adult population over the age of 60 (Lynch, Trost, Salsman, & Linehan, 2007).

When applied to a chronic pain patient in a case study, DBT skills have also shown effectiveness with decreased pain and other outcome measures (Linton, 2010). The treatment utilized with this 52-year-old female included skills related to goal-setting, exposure, validation, acceptance, and emotion regulation. After 16 sessions over a six-
month period, ratings of pain intensity, depression, insomnia, and catastrophizing decreased significantly, whereas goal-orientation increased. These findings were maintained upon assessment at a three-month follow-up appointment. Therefore, although DBT was not originally designed to treat chronic pain conditions, it may produce similar effects of longer mindfulness-based treatments for chronic pain (e.g., Kabat-Zinn, 1982; Kabat-Zinn et al., 1985; McCracken & Eccleston, 2005).

An investigation by Austrian, Kerns, and Reid (2005) focused on the willingness of people over the age of 65 years to participate in exercise and relaxation programs to manage their chronic pain. Findings indicated the majority of older people were willing to undertake these therapies, but infrequently did so because of perceived barriers. The barrier predicated by the most substantial number of participants was the lengthy time commitment required by these types of therapies. Because of the major time-commitment treatment barrier, it is suggested that the brevity of DBT mindfulness makes it an optimal course of treatment for chronic pain patients. The mindfulness module is typically taught over the course of two weeks in two 2-hr sessions (Linehan, 1993b). For the purposes of the current study, a third session was added to provide enough time so that additional DBT skills could be covered. These skills are theoretically linked to the treatment of chronic pain. For example, Radical Acceptance is a skill that teaches participants how to completely accept reality just as it is, regardless of what painful circumstances or sensations come their way. This skill represents fully opening to the experience of life and is particularly applicable to the treatment of chronic pain. For example, a patient may attempt to open his or her mind to the possibility that his lower back pain is a part of reality that cannot always be avoided in order to prevent him or her
from the suffering that comes from rejecting the inevitability (i.e., reality) of his pain. In other words, experiencing pain in life is inevitable, but suffering can be reduced by acceptance of pain. It is for this reason that an acceptance measure is included in the current investigation (Chronic Pain Acceptance Questionnaire; McCracken, Vowles, & Eccleston, 2004; see Appendix A). In addition to the Radical Acceptance skill, participants were taught the Pros and Cons skill in order to identify and discuss both the benefits and setbacks of having chronic pain.

Because of the results that MBSR exhibited with chronic pain patients, coupled with the versatility of DBT skills, there is reason to believe that DBT mindfulness training would have similar outcomes on chronic pain patients. Therefore, it was proposed that three sessions of Linehan’s (1993b) DBT mindfulness skills training may also provide powerful relief to patients with chronic pain. Specifically, it was hypothesized that:

1. When comparing a standard treatment as usual group of older incarcerated adults with a treatment as usual plus DBT group, there would be a significant treatment by time interaction effect on the Short-Form McGill Pain Questionnaire total pain score such that, over the course of treatment and follow-up, the DBT group would have significantly greater reductions in pain ratings as compared to the control group.

2. When comparing a standard treatment as usual group of older incarcerated adults with a treatment as usual plus DBT group, there would be a significant treatment by time interaction effect on the physical health composite scores (PCS) on the RAND 36-Item Health Survey such that, over the course of treatment and follow-
up, the DBT group would have significantly greater increases on PCS as compared to the control group.

3. When comparing a standard treatment as usual group of older incarcerated adults with a treatment as usual plus DBT group, there would be a significant treatment by time interaction effect on the mental health composite scores (MCS) on the RAND 36-Item Health Survey such that, over the course of treatment and follow-up, the DBT group would have significantly greater increases on MCS as compared to the control group.

4. When comparing a standard treatment as usual group of older incarcerated adults with a treatment as usual plus DBT group, there would be a significant treatment by time interaction effect on the Chronic Pain Acceptance Questionnaire such that, over the course of treatment and follow-up, the DBT group would have significantly greater increases on the total score as compared to the control group.

A manipulation check of the independent variable was utilized to ensure that participants in the treatment group became more mindful after their training. Specifically, the 15-item Mindful Attention Awareness Scale (MAAS) was used to assess participants on cognitive, emotional, physical, interpersonal, and general mindfulness domains.

Method

Participants

Participants were inmates at a Midwestern, medium-security, state prison. The 31 male participants of this study were aged 50 and over and had a mean age of 58.5 years, with a range of 50-74 years. The median age for enrolled participants was 59 and the modal age was 50 years. An additional procedure for checking comprehension of the
informed consent process was utilized as an inclusion criterion (see description below). In addition to chronic pain, common medical diagnoses for these particular inmates included arthritis, neuropathy, and diabetes mellitus (see Table 1). All participants met standard criteria for chronic pain (duration of six months and associated medical diagnosis). After chronic pain, the most recurrent comorbid diagnosis was arthritis with a frequency of 38.7 percent. All but two individuals indicated that they had attempted prior treatments for chronic pain such as surgery, physical therapy, local anesthesia, and oral medications (see Table 2). No individuals reported having attempted Mindfulness practice prior to the current study. The most common treatment method utilized by participants throughout their incarceration and during the course of the study was ibuprofen, with temporary or otherwise limited success reported. The current investigation enrolled 32 participants (18 for the treatment condition, 14 for the control condition) to ensure the adequate sample of treatment completers for statistical analysis and accommodate for any dropout. One participant (who was randomized to the treatment condition) completed the intake session and Time 1 measures but transferred to a different correctional institution before he was able to begin the treatment group and complete any additional measures. Thus, data from 31 participants are included in the statistical analyses.

Measures

Short-Form McGill Pain Questionnaire. The Short-Form McGill Pain Questionnaire (SF-MPQ) measures pain from the previous week (see Appendix A). The MPQ is the most frequently used and referenced pain assessment measure worldwide (McGill Pain Questionnaire, n.d.). This survey uses three types of questions to assess
pain (Melzack, 1987). The first type asks participants to describe their pain in the last week. Subsequently, the patients use a 4-point scale ranging from none (0) to severe (3) to rate 15 sensory and affective descriptors (11 sensory, 4 affective), such as “throbbing” and “tiring-exhausting.” These pain scores are derived from the sum of intensity ratings for each descriptor (0 = none, 1 = mild, 2 = moderate, or 3 = severe). Sensory pain (SP) is measured by descriptors 1-11, and scores range from 0 to 33. Affective pain (AP) scores range from 0 to 12 and are measured by descriptors 12-15. A total score for the SF-MPQ (0-45) is generated by summing all 15 of the rank orders. Next, participants are asked to indicate their pain’s intensity on a visual analogue scale (VAS), which is a horizontal line that indicates either no pain, worst pain, or somewhere in between. Participants are asked to mark the horizontal line to reflect their pain in the last week. The VAS is scored by measuring the distance in millimeters from 0 to their mark. Next, participants are asked to make a check beside a word from a list that describes their present pain intensity (PPI): no pain, mild, discomforting, distressing, horrible, or excruciating. Only the total pain score of the SF-MPQ was utilized to analyze the main study hypotheses, with higher scores indicating greater pain. However, other pain descriptions of the SF-MPQ were used for post hoc analyses.

The scores on the SF-MPQ correlate highly with the full version of the MPQ, and the SF-MPQ has been shown to demonstrate changes over time (treatment) in a manner similar to the standard form (Melzack, 1987; Dudgeon et al., 1993). For example, Melzack demonstrated that total score pain ratings on the short and long form were significantly correlated before and after therapeutic interventions for musculoskeletal pain ($r = 0.93, p < 0.001$ before; $r = 0.70, p < 0.01$ after; $N = 10$), postsurgical pain ($r =$
0.77, p < 0.001 before; r = 0.88, p < 0.001 after; N = 27), and labor pain (r = 0.81, p < 0.001 before; r = 0.92, p < 0.001 after; N = 20). Chen, Dworkin, Haug, and Gehrig (1989) demonstrated that the SF-MPQ had a high degree of consistency across five studies using the cold pressor task. For example, MPQ total pain score means and standard deviations showed similarity across all five studies (Study I, 25.9±12.3; Study II, 26.8±12.3; Study III, 28.5±13.3; Study IV, 27.6±11.6; Study V, 25.9±12.4).

Furthermore, Love, Leboeuf, and Crisp (1989) demonstrated high test-retest correlations for the MPQ’s categories of pain descriptors ranging from 0.29 to 0.83 with a median of 0.48.

**RAND 36-Item Health Survey.** The RAND 36-Item Health Survey (RAND-36) is a comprehensive short-form generic profile measuring health-related quality of life (see Appendix A). It yields eight scale scores (physical functioning, role limitations due to physical health, role limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain, and general health) and two summary scores (physical and mental health) for which higher scores indicate higher health-related quality of life (Hays & Morales, 2001). The physical health composite score (PCS) is comprised of the summation of the physical functioning, role limitations due to physical health, pain, and general health scale scores. In contrast, the mental health composite score (MCS) is comprised of the summation of the role limitations due to emotional problems, energy/fatigue, emotional well-being, and social functioning scale scores. Scoring is a two-step process, beginning with recoding preselected items using a scoring key so that all scores represent a more favorable health state as they get higher (RAND
Health, 2008; see Appendix A). The second step involves averaging the recoded scores to create the eight scale scores as directed.

The RAND-36 is a widely-used measure of health-related quality of life. Investigations of its reliability and validity are promising (VanderZee, Sanderman, Heyink, & de Haes, 1996). In terms of construct validity, all of the scales significantly correlate with intercorrelations ranging from 0.31 to 0.71. Furthermore, with only two exceptions, correlations between corresponding scales on the RAND-36 and the Nottingham Health Profile (NHP) and Dartmouth COOP Functional Assessment Charts/WONCA (COOP/WONCA) were all higher than noncorresponding scales (e.g., RAND-36 physical functioning and NHP physical mobility = 0.69; RAND-36 physical functioning and COOP/WONCA physical fitness = 0.52). According to RAND Health (2008), internal consistency of the different scales is high, with the following alpha values for each of the eight scale scores: physical functioning (0.93), role limitations due to physical health (0.84), role limitations due to emotional problems (0.83), energy/fatigue (0.86), emotional well-being (0.90), social functioning (0.85), pain (0.78), and general health (0.78). The RAND-36 also has published norms (separated by age and gender); the PCS and MCS are reported as T scores that have a mean of 50 and standard deviation of 10 (Ware, Kosinski, & Keller, 1994). More specifically, an adult male sample’s (n = 1055) average T scores and standard deviations are 51.05 (9.4) and 50.73 (9.6), respectively. The samples used in the norming process consisted of patients with a variety of medical conditions including chronic pain, cancer, arthritis, allergies, congestive heart failure, dermatitis, diabetes, hypertension, obstructive pulmonary disease, and myocardial infarction. Internal reliability coefficient alphas for the PCS and
MCS are 0.93 and 0.88, respectively. Only the PCS and MCS of the RAND-36 were utilized to analyze the main study hypotheses. However, subscales were used for post hoc analyses.

**Chronic Pain Acceptance Questionnaire.** The 20-item Chronic Pain Acceptance Questionnaire (CPAQ) was used to measure acceptance of pain (McCracken, Vowles, & Eccleston, 2004; see Appendix A). The CPAQ is comprised of two subscales: activity engagement (assessing the tendency to perform activities with pain present) and pain willingness (assessing the relative absence of attempts to control or avoid pain). Each item is rated on a Likert-type scale ranging from 0 (never true) to 6 (always true). Activities engagement scores are calculated by adding items 1, 2, 3, 5, 6, 8, 9, 10, 12, 15, and 19, whereas pain willingness scores are calculated by reverse scoring (and then summing) items 4, 7, 11, 13, 14, 16, 17, 18, and 20. A total score is calculated by summing the activities engagement and pain willingness scores, with higher scores indicating a greater level of acceptance. Internal consistency values of 0.78 (pain willingness) and 0.82 (activity engagement) have been demonstrated for the CPAQ. Additionally, its validity as a measure of acceptance of pain has been supported with significant correlations with measures of avoidance, distress, and daily functioning. McCracken et al. divided scores from the Beck Depression Inventory (BDI), Pain Anxiety Symptoms Scale (PASS), and Sickness Impact Profile (SIP) into three variable groups (medically oriented variables, physical and work functioning, and emotional/social functioning issues) and examined their correlations to subscales of the CPAQ. For example, McCracken et al. found that the CPAQ activity engagement and pain willingness subscales both correlated positively with pain-related anxiety as
measured by the emotional/social variable group ($r = -0.51, r = -0.63, p < 0.001$, respectively).

**Mindful Attention Awareness Scale.** Finally, a manipulation check of the independent variable was implemented to ensure that participants in the treatment group become more mindful after their training. The Mindful Attention Awareness Scale (MAAS) was used to assess participants on cognitive, emotional, physical, interpersonal, and general mindfulness domains (Brown & Ryan, 2003; see Appendix A). This self-report mindfulness measure contains 15 items presented on a six-point Likert scale ranging from 1 (almost always) to 6 (almost never). The MAAS has a total score, which is the sum of the 15 items. Higher scores indicate a greater degree of mindfulness. Respondents are asked to rate items in terms of what “really reflects” their experience, rather than what they believe their experience should be, in order to reduce social desirability. The MAAS correlates positively with a variety of self-report instruments that examine self-awareness. The Trait Meta-Mood Scale (TMMS) measures attention to feelings, clarity of emotional experience, and repairing unpleasant mood states (Salovey et al., 1995). The MAAS correlated with overall emotional awareness as examined by the TMMS at .46 ($p < .001$), attention ($r = .19, p < .001$), clarity ($r = .49, p < .0001$), and repair ($r = .37, p < .0001$). Coefficient alpha ranges from .82 in an undergraduate sample ($N = 327$) to .87 in a general adult sample ($N = 239$), and temporal stability was assessed with an undergraduate sample over a four-week period ($N = 60, ICC = .81, p < .0001$; Brown & Ryan, 2003). The MAAS also correlates to various measures of well-being, such as positive affect on the Positive and Negative Affect Schedule ($r = .30, p < .0001$; PANAS; Watson, Clark, & Tellegen, 1988).
Procedure

Prior to any data collection, this study was approved by a university Institutional Review Board as well as the state prison’s Research and Review Committee to ensure compliance with human subjects standards. The study followed the subsequent protocol:

1. Referrals of patients who met criteria for chronic pain were made by the state prison’s Psychological Services Unit (PSU) and Health Services Unit (HSU) staff. These staff members included nurses, psychiatrists, and clinical psychologists who engaged in recent contact with the individual and were aware of their chronic pain diagnosis. All staff members had been previously informed of the nature and purpose of the study and were asked to generate lists of referrals and send them to the Principle Investigator who was also a staff member at this facility.

2. All potential participants’ charts were then screened before acceptance into this study to ensure they were the appropriate age (over 50), met criteria for chronic pain (duration of six months or greater with the diagnosis listed in their medical chart), and were not engaged in other behavioral treatments specifically targeting chronic pain (group or individual therapies).

3. Each potential participant was contacted and recited a scripted invitation to participate in the study (see Appendix B). If he agreed, then an appointment with the potential participant was set up to carry out the informed consent procedure and the first assessment.

4. During this scheduled appointment, individuals were provided with an information handout that they could keep (see Appendix C)
5. During the same appointment, individuals completed the informed consent procedure. First, potential participants were asked to read the Informed Consent form to themselves and were provided with assistance if needed. Following their review of the informed consent document, potential participants were asked a series of questions to assess for comprehension of the procedures. These questions were: 1) What are the two conditions to which you may be assigned?, 2) How long will you be asked to participate?, 3) How many times will you be asked to complete questionnaires, 4) If you choose to begin the study do you have to stay in the study?, 5) Do you have any other questions about the study? If a potential participant provided any incorrect answers to questions one through four, the researcher reviewed the correct answer with him. After finishing the review the researcher again asked them the comprehension question. If it became clear that the potential participant did not comprehend, then that person would have been excluded from participation. However, no participants were excluded from participation in this study based on this criterion. All participants who successfully completed the comprehension procedure and agreed to participate signed the study’s informed consent form. There were no participants who went through the consent procedures who refused to enter the study.

6. All participants who consented to participate in the study were randomly assigned to one of two conditions by using a series of randomly-ordered, one-to-three-digit numbers (i.e., odds to treatment and evens to control) thus creating a randomized, controlled research sample.
7. After each participant granted consent and was randomly assigned, he completed the first set of questionnaires (i.e., CPAQ, SF-MPQ, RAND-36, & MAAS, see Appendix A). This was considered the Time 1, pre-treatment administration. The order of the questionnaires was counterbalanced to control for fatigue effects.

8. Participants assigned to the treatment condition additionally engaged in DBT commitment strategies and troubleshooting to increase the likelihood that they would attend each session. Examples of these strategies are described in the original DBT treatment manual (i.e., Linehan, 1993a) and included devil’s advocate, utilizing foot in the door, evaluating pros and cons, and highlighting the absence of alternatives.

9. Following completion of questionnaires, participants were informed of what they would be asked to do after the initial appointment. Participants in the control group were told that they would be asked to fill out the questionnaires again two more times (i.e., approximately three weeks after the current appointment at Time 2, and approximately seven weeks after the current appointment at Time 3). Individuals assigned to the treatment group were given information about the group including time, location, and duration of the DBT mindfulness skills training appointments. They were notified that they would be asked to fill out the questionnaires after completion of the last skills training appointment in approximately three weeks (i.e., Time 2) and one month after the final appointment (i.e., Time 3).

10. To ensure confidentiality, all participants were assigned an identification number. All data and documents connecting patient information were encoded in a form
that used only this number. A tracking form that connected participants’ names and identification numbers was maintained only for the purposes of collecting measures at different time points. This form was kept in a locked filing cabinet behind a locked door and was destroyed upon the completion of data collection.

11. Treatment-group participants met for two hours one day per week for three consecutive weeks and participated in the intervention (described below). Participants in both conditions continued with typical care at the prison.

12. At the conclusion of the third treatment session, participants in the treatment condition completed the second set of questionnaires (Time 2; see Appendix A), with the order counterbalanced to control for fatigue effects. At the same time, the questionnaires were administered to the control-group participants.

13. One month later, all participants were administered the final set of questionnaires (Time 3; see Appendix A), placed in counterbalanced order to control for fatigue effects.

**Intervention.** Participants in both conditions were asked to continue with their typical care for chronic pain. In addition, the treatment condition underwent three weeks of Linehan’s (1993b) mindfulness skills training, a specific component of DBT.

Linehan’s method emphasizes a synthesis of emotional and rational thinking into a “wise mind,” which is designed to enable participants to reach a more balanced state of being, as well as to non-judgmentally perceive their pain, and their entire world, just as it is (Linehan, 2003). The treatment attempts to help patients achieve three objectives: to increase their control over awareness, to achieve a “wise” emotional and rational integration as described above, and to experience a sense of connectedness with
themselves and the world around them (Lynch et al., 2006). Although this treatment was not originally designed to treat chronic pain, it provides a brief mindfulness intervention that may produce similar effects of longer mindfulness-based treatments for chronic pain (Kabat-Zinn, 1982; Kabat-Zinn et al., 1985; McCracken & Eccleston, 2005). Sessions were held once per week for 2 hours each occurring over the intervention period. The focus of these sessions was to instruct participants on how to consciously self-regulate their attentional focus to alleviate suffering. A layout of the daily plan for these sessions can be found below. (See Appendix D for sample handouts from Marsha Linehan’s published treatment manual; Linehan, 1993b). The current investigation utilized an updated version of these handouts as permitted by Marsha Linehan; however, due to the fact that they are not yet published, they cannot be included in this document. As part of the skills training experience, participants were asked to engage in mindfulness daily, practicing mindfulness both in group meetings and also completing homework assignments privately. In the event that a group member was not present at the beginning of the session, staff from the group called them in order to encourage them to attend. As previously mentioned, DBT commitment strategies and troubleshooting at the initial meeting were implemented to increase the likelihood that group members would attend every session. Commitment strategies are a primary component of DBT designed to facilitate engagement in treatment. The basic premise of these strategies is to encourage individuals to agree to certain behavioral changes before they attempt to implement them so they will become more motivated to behave in that particular way. More specifically, these strategies included playing devil’s advocate, utilizing foot in the door, evaluating pros and cons, and highlighting the absence of alternatives.
The first day of the intervention began with introductions. This was followed by a brief explanation of mindfulness and a review of confidentiality, group format, and group guidelines. Group members were encouraged to get to know one another and their collective experiences of pain, especially in this initial session. Following introductions and orientation, group members learned the Mindfulness “What” and “How” skills. The three “What” skills are observe, describe, and participate, and these skills are the actions of mindfulness. For example, a participant would be asked to observe the sensation of his breath moving in and out of his body for two minutes. During this time, the individual would be asked to not attempt to change the quality or pace of their breathing but, if this happened, they were asked to simply notice this change. Thus, by practicing controlling attention in a particular manner, in this instance, on breathing, the person could subsequently apply this attentional control toward other activities while feeling pain. The three “How” skills are the adverbs of mindfulness and they are non-judgmentally, one-mindfully, and effectively. Participants in DBT mindfulness skills groups are encouraged to non-judgmentally perceive their experiences, such as pain, and their entire world, just as it is. They are also encouraged to practice doing or thinking one thing at a time (one-mindfully), and to maintain mental flexibility while striving to focus on the treatment procedures and practices that work best for them (effectively).

Participants were invited to take a brief break at the middle of the group session. At the end of the session, participants were given the following homework assignment: Read six mindfulness handouts containing practice suggestions, listen to a practice CD, complete a mindfulness worksheet requiring them to practice at least two of the “Whats” and “Hows” skills, and complete the first mindfulness diary card to track their skill use
and perceived effectiveness (see Appendix E). The six-track, 40-minute practice CD was created for the purposes of this research and contains guided DBT mindfulness practices such as breathing exercises and mindfulness of body. The mindfulness diary card is an adaptation of the DBT diary card designed to encourage participants to monitor their experiences of pain acceptance, physical misery, and level of success at implementing the skills they learn each week.

The second day of the intervention began with a review of the previous session’s homework. Each group member was given the opportunity to share his experiences of completing homework. The other group members were encouraged during this time to provide feedback and support. During the homework review, troubleshooting exercises targeted specific issues participants experienced with their homework and engaged them in personalized behavioral problem-solving from which all group members could learn. Following a brief break, participants learned the “radical acceptance” skill (accepting from deep within ourselves what is and the fully open experience of reality). Next, participants were given a homework assignment (complete the radical acceptance worksheet, listen to practice CD, and complete the diary card), and invited to provide observations on their experience in the day’s group.

The final day of the intervention began by reviewing the previous session’s homework in a similar fashion to the previous session. Following a brief break, participants learned the “pros and cons” skill and examined the benefits and setbacks to having a diagnosis of chronic pain. Next, the participants’ motivation to continue their mindfulness practices was targeted, and troubleshooting helped clients manage potential impediments to continued practice. Participants were provided with extra diary cards and
supplemental DBT mindfulness readings and, after the “last day” experience was explored by each individual, they completed the second set of pain and mindfulness questionnaires as a final exercise.

Results

In order to investigate the differences in the dependent measures across pre-test, post-test, and follow-up assessment, a random regression model (RRM, also termed a hierarchical linear model) was used. The RRM allows for comparing the slopes of each group and investigating the change in each group over time, as well as whether this change is significantly different between groups. Several RRM s were run on the sample of participants to determine whether the DBT treatment had significant effects as compared to the control group. Contrary to the first hypothesis, no significant differences were found in the slopes between the DBT treatment group and the control group for the SF-MPQ total pain score (see Table 3). In contrast to the second hypothesis, no significant treatment by time interaction effect was found on the physical health composite score on the RAND-36 (see Table 3). No difference in slope was found with the results of the RAND-36 mental health composite score; thus, the third hypothesis was not supported (see Table 3). Finally, when comparing the treatment group with the treatment as usual plus DBT group, there was no significant treatment by time interaction effect on the Chronic Pain Acceptance Questionnaire (see Table 3).

In addition, the manipulation check of the MAAS total score did not indicate significant changes in measured mindfulness for participants (see Table 3). For control-group participants, no significant changes were noted within this condition over time ($t = -0.009, p = 0.993$). Similarly, no significant changes on the MAAS total score were
observed within the treatment condition over time ($t = 0.472, p = 0.639$). Further post-hoc analyses of outcome measures yielded similar results, indicating no significant differences in the slopes of the two conditions on seven of the RAND-36 subscales, SF-MPQ Visual Analogue Scale, the SF-MPQ Present Pain Intensity Scale, as well as the CPAQ subscales (Pain Willingness and Activity Engagement; see Table 4). One significant difference in the slopes of the two conditions was found on the RAND-36 energy/fatigue subscale, with participants in the control group indicating a greater increase in energy than treatment-group participants over time ($t = 2.84, p = 0.01$; see Table 4).

Effect sizes (Cohen’s $d$) for all of the outcome variables were calculated. These numbers were utilized to conduct power analyses in order to determine the required sample size needed to obtain a statistically significant finding for each variable (see Table 5). Three of the RAND-36 subscales yielded small effect sizes, specifically the social functioning scale (favoring the control condition; $d = -0.29$), pain scale (favoring the treatment condition; $d = -0.21$), and general health scale (favoring the treatment condition; $-0.31$). An analysis of sample size with alpha = .05 and power = .80 indicated that 288, 538, and 262 total participants (respectively) would be required to obtain a statistically significant finding with these effect sizes. A significant, medium effect size was calculated for the RAND-36 energy/fatigue scale (favoring the control condition; $d = 0.77$).

**Discussion**

The purpose of this study was to examine the effectiveness of DBT mindfulness skills training on older adults with chronic pain. Typical treatments for this population
often suffer from one (or more) of three main limitations: high cost, high time commitment, and low effectiveness. The present intervention sought to overcome these three challenges and provide a time-efficient, low-cost, and effective cognitive-behavioral treatment for chronic pain in a sample of adults over 50. Primary outcome variables included measures examining pain, functionality, acceptance, and mindfulness. Participants at a medium-security correctional institution were randomly assigned to either a DBT mindfulness skills training treatment or a treatment as usual control group. Between these two groups, a random regression model analysis compared changes in measured outcomes across a pre-treatment, post-treatment, and a one-month follow-up sequence of time periods. The analysis yielded no significant treatment by time interactions when examining the slopes between the two groups.

The findings indicated that this particular implementation of the DBT mindfulness skills training module did not produce significant reductions in pain ratings, increases in physical or mental health-related quality of life, or increases in chronic pain acceptance in a sample of incarcerated older adults. Interestingly, results of the mindfulness measure did not indicate that treatment-group participants’ levels of mindfulness significantly changed as compared to the participants in the control group. This particular finding may suggest problems associated with the delivery of the intervention as well as a possible misapplication of this kind of cognitive-behavioral treatment to this population in general. To date, there have been no published randomized trials that cite the specific effects of DBT on the condition of chronic pain, much less the appropriateness of a particular component of DBT for the unique population of incarcerated men over the age
of 50. Thus, the present study may be conceptualized as the preliminary examination of DBT’s effectiveness within the realm of chronic pain treatment.

Limitations

There were several limitations present in this study. One such limitation is the environment in which the intervention took place. Like most medium-security correctional institutions, this prison’s setting was full of distractions, rules, regulations, and other impediments to fostering a sense of mindfulness and inner peace. Some individuals in the treatment group also expressed trepidation about engaging in mindfulness practice in front of their cellmates. Although topics like these were addressed in the group discussion, it was clear that many inmates planned on only practicing the skills during the limited time of the day when they could be alone in their cells. The prison staff and other prison inmates also tend to promote a pejorative, judgmental quality in daily interactions. In fact, compliments and acts of kindness are routinely misunderstood and punished in the prison setting, resulting in several inmates regularly receiving conduct reports for “soliciting staff for special treatment” when their original intention was simply to act kindly toward a fellow person. Essentially, prisons are designed with safety as the foremost priority and are often not conducive to meditation and healing. For example, some of the study participants (in both conditions) endured verbal disparagements for even taking part in a mental health-related research study. A treatment such as mindfulness can be met with resistance by inmates and professional staff alike, with seemingly low levels of cultural acceptability, apparent value, or practice in these settings. Cultivating a nonjudgmental attitude is one of the primary DBT mindfulness skills that treatment-group individuals learned over the course
of the intervention, and providing an accepting, nurturing sanctuary as a group unit is a fundamental part of the DBT orientation process. DBT participants in other settings have the luxury of utilizing effective avoidance strategies to escape from toxic and consistently judgmental home and work environments. However, outside of the group setting, the participants in this study returned to judgmental surroundings in which they were mandated, by law, to remain.

A related limitation pertaining to the prison environment is that the Principle Investigator and group cofacilitator were technically employees of the state Department of Corrections, an unfortunate (but necessary for study approval) association that ultimately wins few allies in the eyes of most individuals incarcerated within the system. There is a general sense of psychological resistance to services offered by “the system,” which became apparent with comments such as “What’s this treatment actually going to do for me?” and “You all never cared about me in the past, why should I believe you care now?” Despite numerous attempts to both validate the emotional sentiments and check the accuracy of these types of statements (in the DBT tradition), they were consistently reported across both conditions and all data collections.

There are also several aspects of the unique population that should be considered as limitations as well. For example, although this particular conception was not measured as an outcome variable in this study, education level may have been a hindrance in the treatment-group as participants struggled to fully comprehend some of the more intricate concepts discussed. Although a check was in place to make sure that all participants could understand the general premise of the study (and informed consent document), this was not a standardized intellectual achievement measure. It is quite
possible that the mental capacity of several of the individuals served as a treatment barrier, resulting in them not grasping some of the more complex skills that were taught as a part of the intervention. Many individuals in the prison system had not completed a high school equivalent level of schooling, and some had already entered the correctional system before they had an opportunity to finish their former academic aspirations. A major impediment for treating many inmates with cognitive-behavioral interventions is the well-documented overrepresentation of learning and developmental disabilities in prison populations (Hayes, 1997; Hayes & Craddock, 1992; Noble & Coney, 1992). Several previous DBT studies have, therefore, used intellectual ability as an exclusion criterion (e.g., Bohus et al., 2000; Linehan et al., 2006), and it may have proven useful to do so in this research as well.

Possibly as a result of earlier school problems or lack of didactic socialization, the level of participation in the treatment group was another drawback to this study. Some individuals were observed to be completing the previous week’s homework assignments during the group, regardless of prior and continued orientation to proper homework and group procedures. Although 22 diary cards were collected in total, fewer than 50% of individuals completed their diary cards prior to the group session, and over 60% of completers indicated that they had not practiced the skills beyond their exposure to them during the group sessions. Results of the MAAS confirm this finding and verify that, together, treatment group participants did not become significantly more mindful following the intervention.

An additional sample-related limitation is the mental health stability of the participants. Several of the inmates who participated in this study had been placed on the
highest level of clinical monitoring because they carried diagnoses of serious mental illness. These psychological factors may have impacted a participants’ ability to benefit from a treatment such as mindfulness. In essence, quieting the mind and turning one’s awareness inward may have exposed varying degrees of emotional pain; this practice may have become especially aversive when faced in conjunction with confounding difficulties such as the mental anguish associated with being incarcerated or the disconnection from family and other social support systems. According to Gussak (2009), many incarcerated individuals struggle with mental health problems that interfere with their participation in psychological treatments.

Some aspects of the study design may also have been limiting for this study, such as the small sample size. With one exception that actually favored the control condition over the treatment condition (RAND-36 energy/fatigue subscale), effect size calculations indicated that the sample size for this study lacked the necessary statistical power to attain significant findings and detect the effects. The size of the sample, as well as its inclusion of only male participants, limited the generalizability of the findings. In addition, the self-report nature of the measurements in this study required individuals to introspect in a way that may have seemed foreign and unfamiliar to them. Thus, a difficulty with (or resistance to) expressing the true nature of an internal change may have impacted the accuracy of these ratings. Because the concepts of mindfulness, well-being, and acceptance cannot be assessed by use of an external informant, this aspect of the design likely decreased the precision of all outcome measures. Some specific questions on the measures may also represent an overall limitation due to their inappropriateness for correctional populations (e.g., items 1, 2, 6, and 9 on the CPAQ and
items 4 & 10 on the RAND-36). For example, item 1 on the CPAQ states, "I am getting on with the business of living no matter what my level of pain is..." Furthermore, the brevity of the treatment may represent a fundamental shortcoming of the project design. The mindfulness components of this intervention included skills taught during the first session, homework assignments (including listening to the practice CD), and practice sessions at the beginning of all group sessions. It is quite possible that significant differences between conditions would have been obtained if the treatment-group participants were provided with a longer interval to process the information with more frequent exposure to the various mindfulness concepts.

Future Directions

This study contributes to the emerging bodies of literature that expand the applications of both DBT and mindfulness practice. Although the overall null hypotheses of this study were unable to be rejected, successful interventions may be achieved through modifications to the project. An adaptation of this project may examine the application of the intervention to an alternative sample of chronic pain patients, preferably outside of the correctional system due to the aforementioned obstacles. Especially for preliminary research directions, it may prove constructive to implement a brief, standardized, intellectual screener to all participants at the onset of the treatment in order to select for individuals who are more likely to benefit from learning environments.

In order to increase the potency of the intervention, it may be helpful to improve the commitment procedures. Focusing more on each individual’s pain experience, as well as the specific targeting of practice intentions and plans may result in better productivity in this endeavor. Finally, future investigators should consider increasing the
length of the treatment as well as the frequency of meetings. For example, a design that required participants to meet two or three times during the first week might allow for corrections and reorientation to occur in a more timely manner and towards the beginning of the study, thus creating more opportunities for participants to gain something meaningful from the intervention before the final session.

Overall, the participants in this particular intervention did not demonstrate measureable benefits after completing the treatment. A number of limitations were present within the participant sample and the prison environment as a whole. Modifications to the research design and increasing the potency of the intervention may lead to outcomes that lend support to the treatment of chronic pain with DBT.
References


Table 1

*Medical Diagnostic Frequencies*

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Frequency (number)</th>
<th>Frequency (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Pain</td>
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<td>100</td>
</tr>
<tr>
<td>Arthritis</td>
<td>12</td>
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<tr>
<td>Diabetes Mellitus</td>
<td>5</td>
<td>16.1</td>
</tr>
<tr>
<td>HTN</td>
<td>5</td>
<td>16.1</td>
</tr>
<tr>
<td>Bone Fracture</td>
<td>4</td>
<td>12.9</td>
</tr>
<tr>
<td>Neuropathy</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>Sleep Apnea</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>Asthma</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>Cancer</td>
<td>2</td>
<td>6.5</td>
</tr>
<tr>
<td>Carpal Tunnel</td>
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<td>6.5</td>
</tr>
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<td>Fibromyalgia</td>
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<td>3.2</td>
</tr>
<tr>
<td>MRSA</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>RLS</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>Meningitis</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>Hernia</td>
<td>1</td>
<td>3.2</td>
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</table>

Note: Hypertension (HTN), Methicillin-resistant Staphylococcus Aureus (MRSA), and Restless Leg Syndrome (RLS).
### Chronic Pain Treatment Histories

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Frequency (number)</th>
<th>Frequency (percent)</th>
</tr>
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<tbody>
<tr>
<td>Pharmacological</td>
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<td>90.3</td>
</tr>
<tr>
<td>PT &amp; Physical Exercise</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>Surgical</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>TENS Unit</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>Cognitive/Behavioral</td>
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<td>3.2</td>
</tr>
<tr>
<td>Yoga Practice</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>SCS &amp; IDD</td>
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<td>0</td>
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<tr>
<td>Anesthetic</td>
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<td>0</td>
</tr>
<tr>
<td>Mindfulness</td>
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<td>0</td>
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</tbody>
</table>

Note: Physical Therapy (PT), Transcutaneous Electrical Nerve Stimulation (TENS), Spinal Cord Stimulator (SCS), and Implantable Drug Delivery System (IDD).
Table 3

Means, Standard Deviations, and Longitudinal Outcome Measures for Treatment and Control Groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Time 1 (pre-treatment)</th>
<th>Time 2 (post-treatment)</th>
<th>Time 3 (follow-up)</th>
<th>Differences Between Slopes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Treatment (n=17)</td>
<td>Control (n=14)</td>
<td>Treatment (n=17)</td>
<td>Control (n=14)</td>
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<tr>
<td>CPAQ Total</td>
<td>64.24 ± 17.31</td>
<td>65.07 ± 16.39</td>
<td>59.94 ± 12.95</td>
<td>65.64 ± 21.89</td>
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<td>RAND-36 PCS</td>
<td>169.41 ± 101.18</td>
<td>190.89 ± 110.97</td>
<td>192.06 ± 102.21</td>
<td>207.14 ± 118.52</td>
</tr>
<tr>
<td>RAND-36 MCS</td>
<td>203.68 ± 88.48</td>
<td>222.33 ± 106.39</td>
<td>204.12 ± 92.20</td>
<td>224.82 ± 113.46</td>
</tr>
<tr>
<td>SF-MPQ Total</td>
<td>18.35 ± 10.46</td>
<td>15.93 ± 7.93</td>
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<td>15.21 ± 8.88</td>
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<td>MAAS Total</td>
<td>63.12 ± 13.67</td>
<td>69.71 ± 13.96</td>
<td>61.76 ± 10.76</td>
<td>68.00 ± 15.74</td>
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</tbody>
</table>

Note: Data are reported as Mean ± Standard Deviation

Note: Chronic Pain Acceptance Questionnaire Total Pain Score (CPAQ Total), RAND-36 Physical Health Composite Score (RAND-36 PCS), RAND-36 Mental Health Composite Score (RAND-36 MCS), Short-Form McGill Pain Questionnaire Total Pain Score (SF-MPQ Total), and Mindful Attention Awareness Scale Total Score (MAAS Total).
### Table 4

Post-Hoc Means, Standard Deviations, and Longitudinal Outcome Measures for Treatment and Control Groups

<table>
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<tr>
<th>Variables</th>
<th>Time 1 (pre-treatment)</th>
<th>Time 2 (post-treatment)</th>
<th>Time 3 (follow-up)</th>
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<tr>
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<td>Treatment (n=17)</td>
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<td>SF-MPQ VAS</td>
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<td>46.86 ± 20.96</td>
<td>48.29 ± 20.94</td>
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<tr>
<td>SF-MPQ PPI</td>
<td>2.24 ± 1.25</td>
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<td>2.29 ± 1.21</td>
<td>1.86 ± 0.95</td>
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<td>RAND-36 Phys</td>
<td>47.35 ± 28.12</td>
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<td>46.47 ± 27.20</td>
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<td>RAND-36 RLP</td>
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<td>RAND-36 RLE</td>
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<td>RAND-36 NRG</td>
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<td>27.64 ± 9.17</td>
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Note: Data are reported as Mean ± Standard Deviation

Note: Short-Form McGill Pain Questionnaire Visual Analogue Scale (SF-MPQ VAS), Short-Form McGill Pain Questionnaire Present Pain Intensity (SF-MPQ PPI), RAND-36 physical functioning scale score (RAND-36 Phys), RAND-36 role limitations due to physical health scale score (RAND-36 RLP), RAND-36 role limitations due to emotional problems (RAND-36 RLE), RAND-36 energy/fatigue scale score (RAND-36 NRG), RAND-36 emotional well-being scale score (RAND-36 W-B), RAND-36 social functioning scale score (RAND-36 Social), RAND-36 pain scale score (RAND-36 Pain), RAND-36 general health scale score (RAND-36 Gen), Chronic Pain Acceptance Questionnaire Activity Engagement Subscale (CPAQ Activity), and Chronic Pain Acceptance Questionnaire Pain Willingness Subscale (CPAQ Willing).
Table 5

*Effect Size and Required Sample Size Calculations for Entire Sample (n=31).*

<table>
<thead>
<tr>
<th>Variables</th>
<th>t value</th>
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<th>Required Total Sample Size</th>
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<td>0.15</td>
<td>1142</td>
</tr>
<tr>
<td>RAND-36 Phys</td>
<td>-0.09</td>
<td>54.57</td>
<td>-0.02</td>
<td>43568</td>
</tr>
<tr>
<td>RAND-36 RLP</td>
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<td>54.82</td>
<td>-0.03</td>
<td>24342</td>
</tr>
<tr>
<td>RAND-36 RLE</td>
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<td>55.95</td>
<td>0.07</td>
<td>5120</td>
</tr>
<tr>
<td>RAND-36 NRG</td>
<td>2.84</td>
<td>54.42</td>
<td>0.77</td>
<td>44</td>
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<tr>
<td>RAND-36 W-B</td>
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<td>54.43</td>
<td>-0.40</td>
<td>156</td>
</tr>
<tr>
<td>RAND-36 Social</td>
<td>-1.10</td>
<td>55.88</td>
<td>-0.29</td>
<td>288</td>
</tr>
<tr>
<td>RAND-36 Pain</td>
<td>-0.80</td>
<td>55.06</td>
<td>-0.21</td>
<td>538</td>
</tr>
<tr>
<td>RAND-36 Gen</td>
<td>-1.14</td>
<td>54.38</td>
<td>-0.31</td>
<td>262</td>
</tr>
<tr>
<td>CPAQ Activity</td>
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<td>56.14</td>
<td>-0.07</td>
<td>4460</td>
</tr>
<tr>
<td>CPAQ Willing</td>
<td>0.72</td>
<td>57.70</td>
<td>0.19</td>
<td>696</td>
</tr>
</tbody>
</table>

Note: For each calculation, power = .80 and alpha = .05
Appendix A

Instruments Used

The Chronic Pain Acceptance Questionnaire (CPAQ) is protected by copyright so it is not reproduced in this document. This measure is available through Elsevier B.V. at www.elsevier.com/locate/pain.

The Short-Form McGill Pain Questionnaire (SF-MPQ) is protected by copyright so it is not reproduced in this document. This measure is available through McGill University at http://www.mcgill.ca/.

The RAND 36-Item Health Survey (RAND-36) is protected by copyright so it is not reproduced in this document. This measure is available through the RAND Corporation at http://www.rand.org/health/surveys_tools/mos/mos_core_36item.html.

The Mindful Attention Awareness Scale (MAAS) is protected by copyright so it is not reproduced in this document. This measure is available through the American Psychological Association at http://www.apa.org.
Appendix B

Script for Potential Participants

"Hello. My name is [Principle Investigator] and I am a doctoral student who works here under the supervision of [supervisor’s name at institution]. How are you? I am conducting a study through [facility name] to demonstrate the effectiveness of a way to treat chronic pain. This treatment does not require you to have any surgeries or take any medications in addition to the ones you might already take. If you choose to participate you will be asked to complete some brief questionnaires on three occasions. Also, individuals who choose to participate will be randomly assigned to one of two groups. In one group individuals will continue with their usual treatment for chronic pain. In the second group individuals will receive three group treatment sessions in addition to their usual treatment. This additional treatment will be provided free of charge. These sessions will involve meeting as a group and learning mindfulness skills. Mindfulness means purposefully focusing your attention inwardly. Participation is completely voluntary. Do you have any questions? Are you willing to participate?"
Appendix C

Information Handout

TO: Research Participants
FROM: [Name], Principle Investigator

Thank you for your interest in this research study. Please take a moment to review the following procedures in which you will be involved. Every person chosen for this study will be assigned to either a Treatment As Usual (TAU) group or a Treatment group. In the TAU group, you will continue with your usual care for chronic pain. In the second study group (Treatment group), in addition to your usual care, you will be asked to participate in an additional mindfulness skills training group. Mindfulness is a mental state that involves concentrating your awareness on your own thoughts, feelings, behaviors, and motivations. These meetings will entail group discussion, mindfulness practice, and the delegation of homework assignments pertaining to mindfulness. This Treatment group will meet for 2 hours, one day per week, for three weeks.

You will be "randomized" into either one of the study groups (Treatment or TAU). Randomization means that you are put into a group completely by chance. It is like flipping a coin. Regardless of which group you are assigned to, you will be asked to complete the following surveys once during an individual session with a researcher, again approximately 3-4 weeks later, and a third (and final) time one month after that:

- The Short-Form McGill Pain Questionnaire (SF-MPQ), which will measure present-moment pain.
- The RAND-36, which will examine health-related quality of life.
- The Mindful Attention Awareness Scale (MAAS), used to assess you on cognitive, emotional, physical, interpersonal, and general mindfulness domains.
- The Chronic Pain Acceptance Questionnaire (CPAQ), which will be used to measure acceptance of pain.

Participation in this study is voluntary, and you may quit at any time. If you have any questions regarding this research, please contact [Principle Investigator] or his supervisor, [Clinical Supervisor], in the Psychological Services Unit by using a green slip. Thank you again for your interest in participating in this research study.

Sincerely,

[Name], Principle Investigator
Appendix D

Skills Handouts

The Dialectical Behavior Therapy (DBT) skills handouts are protected by copyright so they are not reproduced in this document. These forms are available in the DBT Skills Training Manual, cited below

### Mindfulness Diary Card

<table>
<thead>
<tr>
<th>Circle Start Day</th>
<th>Highest Rating For Each Day</th>
<th>Were the skills helpful to you when you used them?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Of Week</td>
<td>Acceptance of pain</td>
<td>Physical Misery</td>
</tr>
<tr>
<td>MON</td>
<td>0-5</td>
<td>0-5</td>
</tr>
<tr>
<td>TUE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THUR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Circle the days that you practiced each of the following skills:

1. Wise mind
2. Observe (just notice)
3. Describe (put words on, just the facts)
4. Participate (enter into the experience)
5. Non-judgmental
6. One-mindfully (present moment)
7. Effectiveness (focus on what works)
8. Pros and Cons
9. Radical Acceptance
Summary

Title: Effects of Dialectical Behavior Therapy Mindfulness Skills Training on Older Adults with Chronic Pain

Problem: Despite epidemic levels of chronic pain among older adults, treatment options are severely lacking. The standard treatments for chronic pain suffer from one or more of three main problems: 1) high cost, 2) low effectiveness, 3) high time commitment. Mindfulness treatments for chronic pain have been established and validated in older adult populations; the current study employs a randomized clinical trial to examine whether a briefer version of mindfulness training can be effective. This investigation evaluates the effectiveness of Dialectical Behavior Therapy (DBT) mindfulness skills training on pain management in a sample of 31 older adults. It was hypothesized that participants in the treatment group would experience decreased pain and increased mindfulness, acceptance of pain, and health-related quality of life.

Method: All participants who consented to participate in the study were randomly assigned to one of two conditions. Participants assigned to the treatment condition engaged in DBT commitment strategies and troubleshooting to increase the likelihood that they would attend each session. At pre-treatment, all participants in both conditions completed the first set of questionnaires, including the Chronic Pain Acceptance Questionnaire (CPAQ), the Short-Form McGill Pain Questionnaire (SF-MPQ), the RAND 36-Item Health Survey (RAND-36), and the Mindful Attention Awareness Scale (MAAS). Participants in the control group were told that they would be asked to fill out the questionnaires again two more times (i.e., approximately three weeks after the current appointment at Time 2, and approximately seven weeks after the current appointment at Time 3). Individuals assigned to the treatment group were notified that they would be asked to fill out the questionnaires after completion of the last skills training appointment in approximately three weeks (i.e., Time 2) and one month after the final appointment (i.e., Time 3). Treatment-group participants met for two hours one day per week for three consecutive weeks and participated in the intervention. These sessions included DBT mindfulness Whats and Hows skills, as well as the Radical Acceptance and Pros and Cons skills from the DBT Distress Tolerance module. Participants in both conditions continued with typical care at the prison.

Findings: In order to investigate the differences in the dependent measures across pre-test, post-test, and follow-up assessment, a random regression model (RRM, also termed a hierarchical linear model) was used. The RRM allows for comparing the slopes of each group and investigating the change in each group over time, as well as whether this change is significantly different between groups. A RRM was run on the sample of participants to determine whether the DBT treatment had a significant effect as compared to the control group. In contrast to the findings of some previous studies demonstrating decreased pain and increased mindfulness, acceptance of pain, and quality of life, no such effects were found in this study. Effect sizes were calculated for each variable. Small effect sizes were found for the social functioning, pain, and general health subscales of
the RAND-36 but the present study did not obtain a sample size large enough to find statistical significance of these effects. One moderate effect size was found that favored the control condition over the treatment condition (RAND-36 energy/fatigue subscale).

**Implications:** This study contributes to the emerging bodies of literature that expand the applications of both DBT and mindfulness practice. The findings indicated that this particular implementation of the DBT mindfulness skills training module did not produce significant reductions in pain ratings, increases in physical or mental health-related quality of life, or increases in chronic pain acceptance. Interestingly, results of the mindfulness measure did not indicate that treatment-group participants’ levels of mindfulness significantly changed as compared to the participants in the control group. This particular finding may suggest problems associated with the delivery of the intervention as well as a possible misapplication of this kind of cognitive-behavioral treatment to this population in general. To date, there has been no published literature that cites the specific effects of DBT on the condition of chronic pain, much less the appropriateness of a particular component of DBT for the unique population of incarcerated men over the age of 50. Thus, the present study may be conceptualized as the preliminary examination of DBT’s effectiveness within the realm of chronic pain treatment. Replications of this study should consider a research sample outside of the correctional system that has been screened for intellectual difficulties. An increase in the frequency of initial intervention sessions, as well as modifications to the commitment strategies, may also help future projects produce stronger effects with treatment-group participants.