

Reducing Chronic Pain Using Mindfulness Meditation: An Exploration of the Role of
Spirituality

By

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A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba

In partial fulfillment of the requirements of the degree of

Doctor of Philosophy

Department of Psychology

University of Manitoba

Winnipeg

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Abstract

Chronic pain is estimated to affect approximately 29% of the Canadian population and causes far-reaching lifestyle changes and difficulties that have personal, social, and economic impact. Managing pain is a complex task that recently has been recognized as requiring a multidisciplinary approach. Significant amounts of research have been conducted to understand the biological and cognitive bases of pain; and yet, spiritual aspects of chronic pain have received less attention. Despite this, spirituality remains an important coping strategy as reported by individuals managing chronic health conditions. Some interventions in use today have spiritual roots; however, western medical treatments of pain often do not recognize or utilize spirituality on a regular basis. Utilizing one such intervention, namely mindfulness meditation (MM), this study attempted to understand the role that MM plays in the management of chronic pain and the development of spirituality. This study measured self-reported pain, anxiety, depression, and spirituality in individuals engaged in an 8-week group process in which individuals were provided chronic pain related psycho-education either with MM or without. A repeated measures model was utilized to measure changes that occurred in reported pain experiences (using the McGill Pain Questionnaire) and in spirituality (using the Spiritual Assessment Scale) to determine if changes could be associated with the teaching of MM. Differences in Affective pain ratings were observed and correlations between pain ratings and spirituality discussed. Reasons for the lack of significant findings, including sample size, power, and measures are discussed.

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Reducing Chronic Pain through Mindfulness Meditation: An Exploration of the Role of Spirituality

Chronic pain is a debilitating disorder affecting millions of Canadians each year. Some have estimated that chronic pain affects approximately 29% of Canadians (Moulin, Clark, Speechley, and Morley-Foster, 2002). According to the Chronic Pain Association of Canada, the financial cost of chronic pain, excluding social cost, exceeds 10 billion dollars annually. Unlike some disorders that require relatively short term adjustments, chronic pain can have long term ramifications that necessitate broad ranging changes to lifestyle, career, and home life (Jamison, 1996). For example, in a Canadian sample of non-cancer chronic pain sufferers from the general population, the reported average duration of pain was approximately 10 years, and the pain intensity was rated as sufficient to negatively impact normal work and social routines (Moulin, Clark, Speechley, & Morley-Foster). Alterations to lifestyle are often difficult to make and even harder to rationalize and accept. However, the unrelenting nature of chronic pain makes ignoring change difficult. With significant numbers of people suffering from chronic pain, both at work and home, finding effective treatment methods is extremely important for the well being of significant numbers of Canadians affected by chronic pain (Moulin, Clark, Speechley, & Morley-Foster). Adequate pain relief is often elusive and temporary. Additionally, a significant number of individuals with chronic pain express concern about the addictive potential of analgesic medications. A multidisciplinary approach to pain management has advantages over medication alone (Scascighini, Toma, Dober-Spielmann, & Sprott, 2008). As noted in the Massachusetts General Hospital Handbook of Pain Management, “optimal management of chronic pain must address not only the

initiating physical pathology but also the social and psychological sequelae that accompany the pain and contribute to the poor quality of life” (Loder, Herbert, & McAlary, 2002, p. 262). Intervention programs that address all of these areas increase the likelihood of establishing optimal management of chronic pain. Psychology has made some extremely useful contributions to the understanding and treatment of chronic pain disorders. Various theories based upon clinical evidence have elucidated a number of non-physiological factors that contribute to the subjective evaluation of pain. Avoidance behaviors, catastrophizing cognitions, and predisposing personality traits, have all been shown to contribute to the perception of pain (Asmundson, Norton, & Norton, 1999; Weisberg & Boatwright, 2007). However, the understanding of the impact of psychological variables on chronic pain is incomplete and other factors still need to be examined.

Relevance of Spirituality to the Canadian context

Research has explored many behavioral, cognitive, and personality variables that affect coping with chronic pain. Surprisingly, little research has investigated the role of spirituality on an individual’s ability to cope with pain. Yet, a belief in a higher power, whether one chooses a term such as “God” or not, has been a consistent theme in human civilizations since recorded history (Koenig, 2002; Pargament, 1997). When one reviews the history of civilizations, one finds a variety of forms of worship and methods for honoring a higher power. This spiritual variety is reflected within the Canadian mosaic in the diverse religious and spiritual beliefs practiced by Canadians. With increasing regularity, individuals report identification with individualized spiritual paths rather than structured religious organizations. A recent research survey reported that 69% of a

nationally representative Canadian sample reported spiritual values to be important (Baetz, Griffin, Bowen, Koenig, & Marcoux, 2004). The impact of spirituality on an individual's life can be far reaching and have implications for how one understands and deals with difficult life situations, including medical issues such as chronic pain.

Relevance of Spirituality to Chronic Pain Management

Research related to the impact of spirituality on pain management, although limited, is beginning to appear in the literature. In a study by Mytko and Knight (1999), the relevance of spirituality for patients seeking medical care was assessed. These authors found that a significant number of patients would like some holistic reference to spirituality included within their healthcare. However, medical professionals are often reluctant to discuss and address spiritual issues (Kristeller, Zumbun, & Schilling, 1999). While there are various reasons for this reluctance, unaddressed spiritual issues not only leave patients with unmet needs but may also disregard a very important source of coping and healing. Research investigating the relationship between chronic pain and spirituality seems to be an important area for exploration to allow healthcare systems and professionals to confidently discuss and access all psychosocial resources available to the patient for improved chronic pain management (Unruh, 2007). Interventions that can capitalize on personal spiritual resources become increasingly important and possibly cost effective ways of coping and managing chronic disease. While many activities relate to spirituality, meditation is one that has a long history in spiritual traditions [National Center for Complementary and Alternative Medicine (NCCAM), 2007]. While there are a variety of forms of meditative practice, some have received more attention than others within clinical arenas. One form of meditation that has received increasing attention and

interest is mindfulness meditation (NCCAM, 2007). Mindfulness is a meditative practice from Buddhist traditions that has been utilized in a variety of clinical settings in the treatment of various medical disorders, including chronic pain (Kabat-Zinn, 1990). There exists growing evidence for the utility of mindfulness in the management of chronic pain, anxiety, depression, and other physical and mental disorders (NCCAM, 2007). However, in studying mindfulness, the available literature is largely silent on the relationship between mindfulness practice and spirituality, despite the roots of this practice in Buddhist spirituality. Indeed, as will be discussed later, the mechanism by which mindfulness acts is still an open question presenting the possibility that spirituality may play a role in how mindfulness aids with the management of chronic pain. One of the questions addressed in this research is whether gains made using mindfulness meditation within a clinical, non-religious setting may also be associated with enhanced self-reported spirituality.

Research related to the efficacy of utilizing spiritual/religious approaches in the management of physical and mental health conditions is contradictory. As will be discussed through a summary of the relevant available literature, a distinction between spirituality and religion can be made that provides a potential pathway to better understand the literature and affords a foundation to better inform medical professionals about spiritual/religious aspects of care as well as future research in the area. This may address some of the current obstacles that limit the use of spirituality in chronic pain management.

First, established views of chronic pain are reviewed, as are some of the treatments that flow from these views. Then spirituality and issues with assessing

spirituality are considered prior to a review of mindfulness practice. Then the elements of chronic pain and mindfulness meditation are discussed. Finally, the details of this study are presented.

Defining spirituality has been a difficult process for those endeavoring to study this concept. Hood, Hill, and Spilka (2009) noted that the definition used in a particular study is determined to a greater degree by the measure used than by any agreed upon definition. The definitions of spirituality and the assessment of spirituality have therefore been intertwined. For this reason, this discussion of spirituality is intermixed with a summary of attempts to measure spirituality. While it is important to separate the definition of a human experience from the measurement method, where ideally the former would lead to the latter, this has not been the case in research on spirituality; this blurring of boundaries is reflected in the literature review presented herein.

Established views of Chronic Pain

The International Association for the Study of Pain has defined pain as an “unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (Jovey, R. D., 2008, p. 9). Chronic pain is defined as

“Pain that persists beyond the usual course of acute illness or healing time of an injury (usually beyond three to six months), associated with a pattern of recurrence over months or years or associated with a chronic pathological process. It is often accompanied by emotional (depressive) symptoms but objective physiological signs are sometimes absent” (Jovey, 2008, 14).

According to this definition, the perception of pain can be seen as having two basic components, one biological and one psychological or emotional.

Biological aspects of pain.

The biological component of pain is broken into five elements: sensory nerve endings (nociceptors), afferent fibers, ascending fibers, higher order brain centers, and descending fibers. This complex physiological system for carrying pain sensation allows the human body to sense, recognize, and modulate the experience of pain. Information regarding the offending noxious stimulus is first taken by the nociceptors that are activated by painful stimuli. This stimulation is conducted to the dorsal horn of the spine by afferent fibers (called a-delta and c-fibers). A-delta fibers transmit information faster than C-fibers although each fiber type conveys a different sensory experience. It is thought that the initial information of the a-delta fiber is felt as a sharp and specific pain, whereas slightly delayed information that is transmitted by C-fibers is burning and more diffuse (Ballantyne, 2002). All of this information is transmitted along the ascending fibers of the dorsal horn. The spinothalamic tract carries information (mostly contralateral but some ipsilateral information) to various regions of the thalamus. The spinohypothalamic tract takes nociceptor information up the spine to the higher centers such as the hypothalamus. It is this connection to the hypothalamus (specifically the suprachiasmatic nucleus) that may produce the sleep and arousal changes associated with chronic pain conditions (Ballantyne).

Areas of the brain also control conscious and unconscious experiences and responses to pain. As mentioned, the hypothalamus and thalamus are two such areas. However, other brain centers that alter the perception of pain include the limbic system

and the somatosensory cortex. Output from these centers can be transmitted through descending neurons and can have a feedback affect on neurons of the dorsal horn. This feedback can be both sensitizing (enhancing the effect of ascending painful stimuli) and desensitizing (reducing the pain stimuli transmitted) and can have a profound effect on the subsequent transmission of painful stimuli through the ascending neurons.

It is important to note that for the purposes of this discussion, the above description is a brief and simplified overview of the biological component of pain perception. The actual processes involved in the perception of pain are more complex and integrated than can be fully described here.

Psychological / Social aspects of pain.

The complex biological process surrounding the reception and processing of painful stimuli is influenced by psychological factors. Psychological and personality factors significantly affect the perception of pain by managing and altering the interpretation of pain stimuli. Koenig (2003) summarized several psychological aspects that modulate the perception of pain. Attention is one important psychological modulator of pain. When attention is directed away from the source of the pain, the perception of pain is diminished. Expectations are another psychological modulator of pain. The expectation of pain is often sufficient to increase the subjective intensity of the painful stimulus (Brown, Seymour, Boyle, El-Deredy, & Jones, 2008). Personality influences the experience of pain by setting limits and boundaries on the threshold of pain that will be acknowledged. Social factors also influence the experience of pain (Eimer & Freeman, 1998). Individuals with family members experiencing chronic pain can be sensitized to the perception of pain (Thomas & Roy, 1999). Cultural factors influence the

experience of pain by setting guidelines that permit, encourage, or discourage the expression of pain in culturally appropriate ways (McGrath, 1994). Many factors, from individual to societal influences, can alter the perception, experience, and expression of pain. These factors are important in the understanding and treatment of chronic pain. As the definition of pain emphasizes, sensory and emotional factors combine to form the experience of pain.

It can be seen from above that there are a variety of influences on the experience of pain. Two metacognitive processes that appear to be important are perception and judgment (Wagner, 2005). Acknowledging the presence of perception and judgment as relevant to pain may provide access to ways in which pain can be managed. Perception is an interpretation of information based upon how one understands a situation. Judgment is the formation of an opinion regarding a particular situation. These two processes are at play everyday of an individual's life, and they form part of the pain experience. Painful sensations pass from various parts of the body through the peripheral nervous system to the central nervous system and the brain. Within the brain, sensations are registered and interpreted within the context of other inputs from the system (some of which are mentioned above). A judgment is then made on the need for and type of action required for this perceived input. When pain is experienced, reduced activity designed to reduce aggravation of the affected area is sometimes the response, and this response continues when pain moves from an acute to a chronic condition (Turk & Winter, 2006; McCracken & Samuel, 2007).

This decision making process is also impacted by the belief system of the individual (Eimer & Freeman, 1998). The results of reactions to painful situations in the

past, an individual's sense of control over the painful sensations, as well as broader psychological beliefs all influence how one responds to the painful experience. This natural flow of events often occurs outside of awareness, as do decisions regarding how to respond to the painful experience.

Cognitive treatments are based upon the acknowledgement and evaluation of the aforementioned processes with regard to helping or hindering the management of and adaptation to pain. Negative thoughts and attitudes are assessed for helping or hindering the individual in his or her coping effort (Koenig, 2003). In this way, cognitive treatments attempt to assist the individual in reassessing the perception of pain, thereby changing the functional importance and impact of chronic pain on daily life. Of growing importance is the role of awareness in recognizing and managing thoughts and beliefs associated with chronic pain (McCracken, Gauntlett-Gilbert, & Vowles, 2007). These thoughts and beliefs can arise in areas related to mood (as in the case of depression and anxiety), activity, stress management, communication, and relapse management. There exists a complex interplay between thoughts, beliefs, behavioral responses, and context, which will be elaborated upon later in this discussion. As will be described further, mindfulness has been described in part as an awareness exercise (Kabat-Zinn, 1990).

Assessment of pain

The assessment of pain involves a complex and multidimensional measurement of the various aspects of pain reflected in the definition of pain as well as the conceptualizations of pain noted above. The assessment of pain can range from a simple measure of the intensity of pain in the moment or over a set period of time, or can range to an accounting of the functional impairment that an individual experiences as a result of

pain. There are various pain assessment tools for use with children and others relevant for use with adults. Another dimension of pain assessment involves the various sources of information that one might choose to select including self report, the report of significant others known by the individual, or the assessment of pain as rated by a clinician. Each type of measure provides a different aspect of the pain experience or the impact of chronic pain upon the individual in question. While a full review of the various tools for pain assessment has been the subject of various books (Turk & Melzack, 2001) and therefore beyond the scope of this review, a selection of more commonly used tools will be quickly summarized to provide a sample. One frequently used measure of pain, the McGill Pain Questionnaire (MPQ), assesses the qualitative aspects of pain (how it feels). The MPQ uses a multidimensional assessment of pain and asks respondents to classify pain according to sensory, affective, and evaluative components. Sensory aspects of pain include temporal, spatial, and thermal aspects; affective components of pain include tension, fear and autonomic aspects; while evaluative aspects incorporate a subjective intensity of the overall painful experience (Melzack & Katz, 2001). This approach to pain assessment has proven very useful in understanding and accurately measuring a person's pain (Melzack & Katz). The MPQ will be more fully reviewed later.

Other pain assessment tools, such as numeric rating scales (NRS), assess pain intensity (how much it hurts). Such scales ask the respondent to rate on a scale from one (no pain) to ten (worst pain imaginable) pain intensity experienced over a set period, usually the previous week (Gagliese & Melzack, 2003). These tools have been widely used and proven useful in assessing pain intensity (Melzack & Katz, 2001). One similar

class of pain assessment tools, called visual analogue scales (VAS) are also used to measure pain intensity. The respondent is asked to place a mark, representing average pain intensity over the past week, on a pre-measured line with one end of the line anchored with “no pain” and the other end of the line anchored with “worst pain imaginable”. A third variation involves using faces of pain which depict various pain states as expressed in pictures of generic faces. An individual is asked to choose the face that best represents how they have felt over the chosen time span. These scales (NRS, VAS, or Faces) are useful since these tools require limited reading ability, are quick to administer, and relatively easy to understand (Melzack and Katz). Accurate pain assessment constitutes an important step toward pain management.

The treatment of chronic pain has focused primarily upon biological interventions. While biologically based treatments of pain (medications or surgical procedures) form a very important aspect of pain management, relevant to this discussion are non-biologically based treatments for chronic pain.

Psychological treatment of chronic pain

Over the past 30 years of development of cognitive and behavioral treatments for chronic pain, there has been increasing evidence that psychological treatments are efficacious (Morley, Eccleston, & Williams, 1999). Widely used psychological treatments for chronic pain generally have two orientations, cognitive and behavioral, with some blending of the two (as in cognitive-behavioral interventions). Other theoretical bases for psychological interventions include psychodynamic and systems focused interventions. Often, a psychologist will work with many different orientations and focus upon a variety of areas in addressing the needs of the patient.

Relaxation training and behavioral monitoring.

Behavioral interventions generally attempt to impact two areas of function. The first is to use relaxation to reduce the negative effect stress can have on the physical and psychological perception of pain. Relaxation training, guided imagery, and biofeedback techniques all build an awareness of stress and assist in alleviating some of this strain. The second area targeted by behavioral interventions monitors and alters the often defensive behavioral changes that occur in response to pain. Guarding behavior, (such as limping or cradling) designed to prevent further injury in acute pain situations, can often become problematic in chronic pain conditions because of the compensation required from other parts of the body and the atrophy that occurs from underutilization of the affected body part. Behavioral strategies often utilize and sometimes teach reinforcement patterns to increase adaptive behavior and decrease maladaptive or pain maintaining behaviors (Turk & Winter, 2006).

A functional assessment of pain episodes that includes antecedents and consequences of pain is often useful in the early stages of behavioral interventions (Von Baeyer, 2007). Antecedents of pain include any factors that precede pain onset including social, physical, and emotional triggers. Consequences typically follow pain episodes and include factors that maintain or reinforce pain-related behavior. This would include avoidance of pain or situations associated with pain. Assessing and analyzing the complex relationship between pain and its antecedents and consequences provides the clinician with a view of some of the issues that may need to be addressed in the intervention.

More broadly, a pattern of social reclusiveness is sometimes seen and can be the result of a variety of factors. Behavioral strategies attempt to reintroduce the use of parts of the body that have been disused and attempt to reengage individuals within their environment and social network. Generally, identifying adaptive behaviors and structuring rewards to follow adaptive behavior are often components of a behavioral strategy (Turk & Winter, 2006). Behavioral treatments have been shown to work well and reduce not only current pain experience but also reduce the number of compensatory but disabling activities associated with pain.

Cognitive therapy.

Cognitive interventions focus on the belief systems of the individual and alter negative or maladaptive beliefs and thoughts that impair a person's view of self or environment. Cognitive strategies initially seek to assess the individual's perception of pain, the influence of pain on current functioning, as well as the individual's response to these changes (Goodheart & Lansing, 2000). Initially, the individual's current level of functioning, experience and response to pain is assessed within a variety of areas including activity, vocation, social, mood, and stress. Then, cognitive strategies are utilized that work towards increasing the functionality of the individual's response by reevaluating the thoughts and beliefs that form a basis of the person's response to pain. Cognitions and beliefs that impact activity level, stress, perception, expectations, interpersonal communication, and mood (to name the most common) are assessed and evaluated as either helping or hindering the individual's ability to function and manage chronic pain. In addressing these issues, effective pain management can be brought

about through changes in the way that people perceive, cognitize, and manage pain (Turk & Winter, 2006).

Expectations have also been shown to play a role in the experience of pain. Drawing on the pediatric pain literature, Spafford, Von Baeyer, and Hicks (2002) note that preparing children for painful procedures can influence reported pain associated with the procedure. These authors found that children prepared with accurate expectations of the procedure and associated pain reported less pain than children who did not receive such preparation.

Another important component of the cognitive process is the ability of the person to become aware of chronic pain and process the automatic thoughts and beliefs that influence his or her response. Pain, as a subjective experience, is uniquely described by the person according to his or her awareness of what contributes to the way he or she perceives and acts to relieve pain, as well as how aware he or she is of its impact. Piira, Hayes, Goodenough and Von Baeyer (2006) noted that as children get older, they become better able to manage pain through sensory focusing strategies that include “focusing attention on the physical sensations of pain or discomfort in a non-distressing way” (p. 836). As will be discussed later, this description has similarities with the moment to moment description referred to in mindfulness meditation. These authors note that the ability to distinguish between sensory and emotional aspects of pain may be related to the ability to reinterpret the pain experiences in order to reduce distress. It seems that the ability to observe and attend to pain can be beneficial for management.

The complexity of both the situation and the required intervention increases as the individual’s beliefs interact with thoughts and behaviors and as one becomes aware of the

anxiety and depression that also influences quality of life as long term behavioral changes become increasingly necessary. Cognitive interventions related to each of the issues described have the potential to affect an individual's response to chronic pain. Overall, cognitive interventions have been shown to have beneficial effects on the functioning of an individual experiencing chronic pain (Masheb & Kerns, 2000).

The interventions described above aim at improving the way the individual copes with chronic pain. Various authors have examined coping strategies to understand the management process. Keefe, Rumble, Scipio, Giordano, and Perri (2004) found that numerous coping strategy measures have been developed and that several conclusions could be drawn. These authors established that patients differed considerably in the type of coping strategy used, as well as in the perceived effectiveness of the coping effort. Furthermore, Keefe and colleagues (2004) found that variations in pain coping were significantly related to pain level, psychological distress, physical functioning, and pain behavior. These authors also noted that one of the coping strategies identified was seeking spiritual comfort.

However, Richardson and Poole (2001), in a review of the same measures, noted that coping was often measured indirectly by focusing on the strategies used. Direct measurement would entail a more complicated process of assessing how the individual with pain was using the chosen strategy. They note that the utility of any strategy is dependent upon the situation (including the intensity of the pain, the surroundings at the time, and the availability of support) and the person implementing the approach (including the perceived availability of resources, the appraisal process, and the intended goal). This reflects the most commonly used definition (Lazarus & Folkman, 1984) that

describes coping as a dynamic process of managing specific external and/or internal demands that are seen as exceeding the available resources of the individual (Richardson & Poole, 2001).

Since 1984, a variety of classification systems have arisen to distill and understand what might constitute effective coping strategies. One such distinction compares problem-focused and emotion-focused coping, while another emphasizes approach versus avoidant coping (Anderson & Willebrand, 2003; de Ridder & Schreurs, 2001). Such classification systems have various shortcomings; and the variety of systems makes comparison between studies difficult. Yet, the subject of coping with chronic pain has remained an important research agenda. In a more recent attempt to understand how individuals live with chronic pain, Esteve, Ramirez-Maestre, and Lopez-Martinez (2007) review literature that found pain acceptance was more successful than coping in predicting pain. Acceptance literature will be reviewed later.

Holistic care and change

While the previous discussion focused on the current prevalent psychological treatments, as research shows, there is still an important part of the human experience (namely spirituality) that has not been addressed systematically in the treatment of the individual with chronic pain. Often, chronic pain brings about a significant change in a person's lifestyle and life course. As was illustrated earlier, many chronic pain patients report pain that has affected their daily functioning for many years. This change often leads to internalized feelings of instability, self-blame, and questions of self-worth. Such core issues can be addressed through psychotherapy. Research also shows that within a medical model, these issues are not addressed and even when identified, the best method

of addressing them is not always clear (O'Hara, 2002). Spiritual aspects of treatment do not necessarily sit in opposition to, or outside of, standard treatments. Indeed, addressing spiritual concerns can be a comfortable adjunct to the physical and psychological work that is carried out (Koenig, 2003). Many individuals frame such core challenges as “what do I do now,” and “why me,” as spiritual questions related to the meaning of life, a sense of inner peace, and a connection to a wider reality (Arnstein, 2003). Therapies that add the spiritual aspects of life and issues faced by the person seeking help can accentuate holistic care and prevent feelings of solitude and the inability to communicate about these core topics.

Western Views of Pain Management

In western society, the historical treatment of pain has been largely medically based (Frischenschlager & Pucher, 2002). Even though research has shown the increasing role of psychological and emotional factors in the debilitating effects of pain, the incorporation of psychosocial treatments for pain disorders has been slow to gain favor. While a variety of factors can be said to have contributed to the present treatment of chronic pain, the limited success that comes from a reliance on medically based treatments can be seen regularly in pain clinics and physicians' offices across Canada and is reflected in the statistics of the economic cost of chronic pain.

Part of the underlying paradigm relates to the age-old division between mind and body as interpreted from the work of Descartes and currently used by Western medicine. Philosophers have continued to debate the application of Descartes' theory to modern medicine and its implications for how people view the human body. No clear answers have been agreed upon and none can be offered here. However, the fundamental

separation between mind and body evident in medical history helps one to understand the current focus on biologically based treatments for chronic conditions (Switankowsky, 2000). Yet, research has shown that fundamental non-physical elements of being (for example, thoughts and beliefs) can have a profound effect on the subjective perception and impact of chronic conditions on daily life. The importance of cognitive elements to the perception of pain has been described previously. What have typically been overlooked in pain literature are the spiritual aspects of perceiving and dealing with pain.

Spirituality

The role of spirituality in chronic pain management is poorly understood. However, there is growing evidence for the usefulness of spirituality in chronic disease management and the need for research in this area is more and more crucial (Rippentrop, Altmaier, Chen, Found, & Keffala, 2005). Despite this increasingly important research agenda, there seems to have been, and continues to be, reluctance in the scientifically oriented West to empirically study and understand spiritual aspects of chronic disease and the associated impact on chronic pain management. Other cultures, primarily Eastern traditions, have long utilized spirituality to assist with coping with illness (Bonadonna, 2003). Despite this Western academic and institutional reluctance, individual members of society continually turn to spirituality for strength and coping as indicated by increasing research on the broad area of spirituality and generalized questioning of the population about the importance of spirituality. While estimates vary, large segments of North American society report belief in a higher power. In the United States (US) and Canada, these estimates are reported to be 88% and 78% respectively (Baetz, Larson, Marcoux, Bowen & Griffen, 2002). Other estimates have placed US percentages of those

believing in a higher power as high as 95% (Mytko & Knight, 1999). These survey results emphasize the importance of spirituality. The prominence and importance of spirituality are equally noteworthy for people who access healthcare systems. Research has found a strong preference of many to have their spiritual needs acknowledged and addressed in healthcare. Surveys have reported that 56% of individuals indicated his/her recovery was aided in some part by faith (Mytko & Knight, 1999). Larson and Koenig (2000) reported that 40% of those with a serious medical illness reported that religious faith was the most important factor enabling them to cope.

Given the importance that spirituality has in the lives of many individuals, the lack of recognition of spiritual resources as a part of the management of various chronic conditions (including chronic pain) would seem to neglect a potentially powerful strategy. Authors have suggested various reasons for this neglect. Some have highlighted the historical lack of education about spirituality available for healthcare professionals, especially family physicians who are positioned to be managers of healthcare resources through the referral process as well as direct providers of health care, as one reason for a reluctance to utilize or even acknowledge this resource (Boudreaux, O'Hea, & Chasuk, 2002). Others have noted the shortage of consistent research investigating spirituality as a coping tool for the patient struggling with a chronic health condition (Unruh, 2007). Still more have written about the difficulties experienced with defining spirituality that make it difficult and often confusing to understand (MacDonald, Friedman, & Kuentzel, 1999). Another contributing factor to this confusion was the group of early definitions that often mixed definitions of

religiousness and spirituality. The use of so many different definitions in surveys often led to unclear, confusing, and contradictory results. As Rew and Wong (2006) note:

Terms such as religiosity, religiousness, religious involvement, and spirituality are often used interchangeably. Scholars who study these phenomena have not reached consensus on theoretical and operational definitions of these terms. Measures of these concepts have been quite varied and often consisted of single-item measures with questionable validity. These limitations preclude the development of testable theory from which to develop health-promoting interventions. (p. 434)

It is with this backdrop that the following sections attempt to review key areas of spirituality. Themes emphasized in various definitions of spirituality are reviewed after which a distinction between spirituality and religiousness is discussed. This is followed by a discussion of some proposed mechanisms by which spirituality may influence experience. A discussion of the measurement of spirituality is provided both to enhance the understanding of the definitions of spirituality as well as to explore the various types of measures available. An operational definition of spirituality for the purposes of this study is outlined and the link between spirituality and meditation explored. Specific aspects of spirituality that relate to mindfulness meditation are discussed prior to a review of the relevant literature on mindfulness meditation.

Definitions of Spirituality

Defining spirituality has been a difficult endeavor, partly because of the complexity of what spirituality has come to represent, and partly because any one individual may focus upon or emphasize (and therefore report) different aspects of spirituality in his/her own lives. Despite this individuality, many have tried to

understand, analyze, and study some of the core elements that represent key aspects of spirituality commonly reported. Different theorists have emphasized distinctive aspects of spirituality and this has been reflected in the variety of definitions (Egbert, Mickley, & Coeling, 2004).

There are a number of definitions of spirituality available today. Some incorporate the meaning of life; others include inner strength and balance, while others include connecting with oneself or a higher power. Some choose a broad definition while others focus upon specific aspects of spirituality. Recognizing this variety and disparity in the definitions of spirituality, researchers have tried to pull together and reconcile the definitions offered by various authors. Chiu, Emblen, Hofwegen, Sawatzky and Meyerhoff (2004) provide an integrative review of spiritual concepts and definitions. Sampling from the available literature, these authors noted that prominent themes in spirituality include existential reality, transcendence, connectedness, and power or energy. Existential reality was found to encompass many aspects of deriving meaning from adversity and finding purpose in life as seen from a spiritual standpoint. They also note that many theorists linked concepts of hope to this theme of spirituality. Another theme noted by Chiu et al. was transcendence, including conceptions of spirituality that described going beyond the present context of reality in both time and space. A third theme of spirituality was found to encompass references to a power or force that was dynamic and integrative in nature and, for some, life-giving in a way that enhances a sense of well-being. The fourth theme encompassed connectedness and relatedness to oneself, others, nature and a Higher Being. This theme encapsulated elements of inner strength, balance, openness, and self-awareness. Additionally, this theme encompassed

having a sense of community, sharing, and helping others; recognition of the integral connection between self and environment; and a relationship with God, a Higher Being, or ultimate values (individually defined aspirations).

Some authors have commented on the importance of relationship from an Eastern perspective in describing a model of spirituality for healthcare. Sulmasy (2002) argues that illness is a disturbance of relationships within as well as outside of a person. Healing brings balance to these intra-personal and extra-personal dimensions. Some of these intra-personal dimensions are biological and psychological. However, Sulmasy argues that spirituality is an important intra-personal dimension and that extra-personal dimensions are not confined simply to interpersonal relationships, but include relationships with one's environment and the transcendent, thereby bringing spirituality into the extra-personal dimension also.

As can be seen from the themes noted above, many components have been described and offered as important aspects of what is necessary to understand better the concept of spirituality. Various reviewers note the increased emphasis on the individual's definition of spirituality as well as the multidimensional nature of the concept. They also note the lack of a consensus in theory and measurement that continues to exist (Chiu et al., 2004; Egbert et al., 2004). This point is reiterated by Hood, Hill, and Spilka (2009), who note that "even we three authors of this text do not fully agree with each other about the meaning of these terms" (p. 11). Hood et al. go on to note that from an empirical perspective, the measure used to operationalize spirituality also defines spirituality for that study. Therefore, the connection between definition and measure is all the more important in the absence of an agreed upon conceptual

understanding. Each of the themes mentioned above can be measured in a variety of ways and various measures combine and operationalize these themes in unique ways.

Spirituality and Religiosity

In discussing spiritual issues and researching spirituality, the distinction between religious and spiritual has become an important one. As Miller and Thoresen (2002) note, spirituality is an individual attribute, while religion is an organized social entity. Some authors have theorized that spirituality is an umbrella term that encompasses religiousness but whose definition is wider than that of religion alone (Dudley, Smith, & Millison, 1995; Musick, Traphagan, Koenig, & Larson, 2002). This more recent perspective acknowledges the ability of individuals to express their spirituality outside of established religious traditions (Burkhardt & Nagai-Jacobson, 2002). There is accumulating research that shows this as an important perspective to consider. Individuals diagnosed as HIV positive tend to distance themselves from traditional religions and identify themselves with a more personalized spirituality (McCormick, Holder, Wetsel, & Cawthorn, 2001).

The need for a wider conceptual framework that incorporates, but does not limit itself to religiosity, extends to research related to treatment issues. An important segment of individuals diagnosed as HIV positive identify spirituality rather than religiousness as providing support and strength in dealing with their medical condition (Carson, Soeken, Shanty, Terry, 1990). In a similar manner, other authors have written about the need for a broader conceptualization of spirituality (beyond religious doctrine and behavior) within other clinical settings such as hospice care (Dudley, Smith, & Millison, 1995). These authors state (as the authors above have) that spirituality can be expressed both

within as well as outside of the religious context, and therefore, a view of spirituality that refers only to religious ideology or behavior will not recognize non-religious expressions of spirituality.

However, broadening the definition of spirituality to be more inclusive brings difficulties in defining exactly what is being measured. In order for spirituality to be seen as a worthwhile addition to the coping armament, it would need to show that it contributed something unique and beyond what was offered by traditional psychology (Piedmont, 2001). Broad definitions, while being inclusive, risk encompassing underlying psychological concepts that are given a spiritual façade but may not be unique. Many definitions of spirituality and the assessment tools that stem from these definitions face this issue. Without a clear conception and definition of what spirituality is, it becomes difficult to determine whether a particular tool effectively measures the concept. This issue continues to challenge the researcher who tries to define and measure spirituality.

Within this context of blended conceptualizations, research premised upon such definitions also becomes difficult to interpret. In an early review of the research that did not distinguish spirituality from religiousness, researchers found that 47 studies showed a negative relationship between religiosity and health outcomes, 37 studies showed a positive relationship, and 31 studies showed no clear relationship (Kohls & Wallach, 2007). While issues with measurements, sample size and composition all contributed to these early contradictory results, mixed definitions may have also been a factor in these conflicting results.

This apparent confusion may be somewhat clarified through the view provided by recent research that elaborates upon and better delineates between varying aspects of religious and spiritual experiences. An example can be found in the research relating prayer with physical and mental health outcomes. Masters and Spielmans (2007), in a recent meta-analytic review, noted some distinctions that are important in finding ways of better understanding research on prayer. These authors noted that when measuring prayer frequency, it was also important to measure prayer content. Prayer that promoted a more active, interactional problem solving stance was associated with better outcome than prayer that was passive and externalizing in coping style. While not elaborated upon in their article, this would appear to indicate that coping strategies that enhanced feelings of empowerment (an aspect of experience that is encompassed by some definitions of spirituality) could be associated with more positive physical and mental health outcomes. Interestingly, the feeling of being at peace was reported to be a better predictor of well being than type of prayer. Again, one might conclude that aspects of spirituality as opposed to religious behavior may better predict and explain positive outcomes.

As noted earlier, the role of spirituality in offering something above what is understood from traditional psychology is still debated. Whether spirituality is better understood as a strategy to access underlying psychological principles (as in the case of empowerment) or is recognized as an independent mechanism (as in the case of feelings of peace) remains unresolved. Utilizing spiritual concepts, however, may provide greater clarity in the research and an enhanced understanding of the underlying mechanisms.

Indeed, the trend toward increased research emphasis on spirituality can already be seen in the literature and would appear to be consistent with the above mentioned

observation. Recent research has combined spiritual with religious measures allowing for the potential comparison of these concepts. Other research has focused solely upon spiritual concepts in understanding how religion and spirituality can fit within an holistic framework. Future research must explore whether spirituality as a study area can provide greater understanding of religious and spiritual processes. Because of the increased emphasis on spiritual concepts, the mechanisms for spirituality are also receiving increased attention.

Mechanisms for Spirituality

As research has increasingly focused upon the effects of spirituality on physical and mental health, some have proposed theoretical mechanisms to understand these effects. Wachholtz, Pearce, and Koenig (2007) have proposed six mechanisms that may help to clarify the relationship between religious/spiritual coping and pain management. The first relates to the creation of meaning and purpose using religious attributions. They state that placing the pain experience within the context of a religious framework could provide for an enhanced sense of comfort or encouragement. The individual may come to understand his/her chronic pain experience as a part of a broader purpose, life meaning, or as a way of transcending and being closer to a higher power. From a religious standpoint these authors would suggest that being closer to God is a part of this mechanism.

The second mechanism suggested as helping to explain the relationship between religious and spiritual coping and chronic pain is involves the enhancement of a sense of self-efficacy and control. Those who might feel a greater sense of control or self-efficacy through spiritual or religious attributions might do so because their belief system would

enable them to conceptualize a personal way of tolerating the chronic pain experience. This belief system might provide for alternate or additional attributions related to the individual's ability to cope, thereby increasing the person's ability to manage pain effectively.

The third mechanism these authors discuss relates to the use of religious or spiritual texts as a form of distraction from pain. Such distraction techniques could be used along with a variety of other similar techniques and mechanisms that are documented in the literature. The authors use the example of reading texts to allow the individual to focus on transcendent ideas or beliefs that would distract from thoughts and ruminations related to the daily stressors of life. They also suggest that those individuals using this strategy would tend to focus less on bodily experiences, allowing increased endurance of greater levels of pain for longer periods.

The fourth mechanism involves participation of the individual within a religious or spiritual community or church. Such participation would provide opportunities for both receiving and giving support. The authors cite evidence from the literature stating that a powerful predictor of physical and mental health outcomes is the level of involvement in a religious community.

Relaxation is the fifth mechanism the authors cite as potentially helping to explain the relationship between religious and spiritual coping and chronic pain management. This mechanism is often cited in the literature as being another useful pain management strategy.

The sixth and final mechanism offered reflects yet unknown aspects of spirituality. These authors posit the possibility that there may be something unique and

unstudied about religious and spiritual coping that may influence, directly or indirectly, the experience of chronic pain.

These six mechanisms, while largely theoretical, offer potential insights into how religious and spiritual coping might affect the management of chronic pain. It is noteworthy that these authors do not necessarily distinguish between religious and spiritual practices, and therefore these mechanisms may not serve to understand the distinction between spirituality and religious coping. In addition, different mechanisms may apply differentially to the way religious and spiritual experiences influence physical and mental health.

The debate over the boundaries between spirituality and religiosity appears to continue. The preceding section summarized some of the core themes found in the relevant literature. The themes noted earlier have been operationalized in different ways by researchers who have designed measures to capture specific or broader aspects of these themes.

Assessing Spirituality

The development of a definition of spirituality has gone hand in hand with the development of a variety of assessment tools to measure spirituality. As mentioned previously, some researchers have attempted to measure religiosity as a measure of spirituality, while others have tried to honor the personal nature of spirituality in the measures designed. Yet, other researchers have attempted to incorporate religiosity into a wider conceptual domain of spirituality in an attempt to measure what has been termed an umbrella concept that may be relevant for a wider range of individuals (Dudley, Smith, and Millison, 1995). This variety of definitions and uncertainty regarding how to

conceptualize the relationship between religiousness and spirituality has produced a wide array of self-report measures. The data from these measures is difficult to compare in a meaningful way given the disparity in the underlying definitions. Measures of religiosity alone, while encouraging at first, do not seem to portray a complete picture of spirituality. Measures of spirituality, while currently lacking unity, seem to hold some promise in being able to assess a wide-ranging concept that can relate to the management of chronic pain.

One attempt has been to measure religious/spiritual (R/S) coping. Measures such as the Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS) have been used to derive a measure of R/S Coping. This measure has a seven item subscale that measures positive or negative R/S coping (Rippentrop et al., 2005). This measure incorporates both religious and spiritual aspects of an individual's experience but notably incorporates religious language in the questions. Additionally, many subscales of this measure have only one to three items each that influence the reliability of the measure. Others have used the Praying/Hoping subscales of the Coping Strategies Questionnaire (Wachholtz et al., 2007). These questions also include specific religious language and the interpretation of the questions has evolved over time. From these measures, definitions of positive and negative R/S coping have evolved. Positive R/S coping has been defined as including collaborative problem solving with God, helping others, and seeking spiritual support from one's community and a higher power. Negative R/S coping has been defined as placing all responsibility on God, feeling abandoned by God, and blaming God for one's difficulty (Wachholtz, Pearce, & Koenig, 2007). Positive R/S coping has been associated with improved mental health, increased adaptiveness in the

face of adversity, and improved physical health outcomes. Positive R/S coping has also been associated with improved pain tolerance. Negative R/S coping has been associated with poor mental health and physical outcomes, as well as increased mortality. However, it is unclear whether people started with a poor prognosis and then turned to negative R/S coping strategies or if negative R/S coping strategies change the ability to cope with poor outcomes in the context of a grave prognosis.

It should also be pointed out that the definitions of negative R/S coping incorporate more religious belief and behavior, while the definition of positive R/S coping (while still referring to God) incorporate more general spiritual concepts. One can see in the definitions of positive R/S coping aspects of interconnectedness, empowerment, and transcendence, which are all aspects of spirituality. This distinction would appear to fit with the observations discussed earlier relating to religious behavior and how spiritual concepts and mechanisms might provide a useful framework for understanding research that measures religious behavior. However, the definition of positive R/S coping does not encompass many of the themes of spirituality discussed previously and therefore may not provide a full accounting of the ways that spirituality is able to positively impact physical and mental health.

Aside from delineating positive from negative R/S coping styles, others have chosen to measure spirituality as a global term without predefining what it might mean for the individual. An example is the Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being (FACIT-Sp) that has two main factors, one measuring “meaning” and the other “Faith.” Questions loading on the faith factor are quite general and allude only to benefits gained from spiritual beliefs. These questions do not allow distinctions

to be made between specific aspects of spirituality that might be beneficial. While such assessment measures are useful because they enable the researcher to capture the greatest breadth of individual definitions, they do not allow for further delineation. An inability to delineate between various spiritual concepts aside, research in Oncology has shown that overall spiritual well-being is a significant and independent predictor of quality of life in cancer patients (Whitford, Olver, & Peterson, 2008). This further demonstrates the importance of understanding the role of spirituality and spiritual well being in disease management.

Operational Definition of Spirituality for this study

Individual authors (some represented above) as well as professions (such as nursing and occupational therapy) have established the importance of spirituality within the holistic conceptualization of the individual. However, spirituality often takes a back seat to other treatment modalities, instead of being a concurrent focus of attention. Yet, as Koenig (2003) states, "...of all the things I've tried to cope with pain and disability, the spiritual approach by far has been the most helpful" (p. 227). The definitions and themes alluded to above present several key aspects of spirituality. However, important components of these definitions of spirituality relevant to the study of Mindfulness practice, are the focus of this study, and therefore need further elaboration.

The first of these components is acceptance. Acceptance has been well researched in the psychological literature discussing chronic pain. McCracken and Vowles (2006) describe acceptance within the context of chronic pain as an awareness of pain without the attempt to change or rid oneself of the hurt. These authors note that studies examining the relationship between acceptance and chronic pain management

have found that "...greater acceptance of pain is associated with less pain intensity, depression, pain-related anxiety" (p. 92) as well as greater functional and overall well-being.

McCracken and Zhao-O'Brien (2009) note that psychological acceptance has been found to be a significant and positive predictor of psychological functioning in clinical and non-clinical samples. Branstetter-Rost, Cushing and Douleh (2009) report that individuals who have received acceptance-based training report significantly higher pain tolerance when compared to individuals using common cognitive-behavioral distraction strategies. The role of acceptance from a psychological standpoint appears to have strong evidence in its support.

It is noted, however, that acceptance from a spiritual perspective has received far less attention within the context of chronic pain research, despite Koenig's observation that acceptance is an important part of the journey of living with chronic pain. He states that "There comes a time, however, when one must accept the pain and disability that remain" (p. 230). He goes on to describe acceptance as part of a spiritual approach to pain that involves finding peace and serenity in the face of pain that is unremitting. Koenig refers to a spiritual attitude toward pain that includes submission, understanding and calling, as well as acceptance. Koenig's definition of submission refers to the cessation blame or vocalizing of complaints about pain and the opening up of the person to a higher purpose. For Koenig, submission also entails submitting oneself to the plan of a higher power (God for example). Understanding requires the recognition that in a place of a limited perception of the world, one can open-up to broader possibilities for the purpose, meaning in life and future experiences. Calling requires the individual to

conceptualize the experience of chronic pain as an opportunity to gain unique insights and understanding about oneself and others. This too is related to finding meaning and purpose in the possibility that one might be able to help others. This spiritual approach to chronic pain management places greater emphasis on acceptance from a spiritual perspective, something this study will examine.

Connection is another important aspect of several definitions of spirituality (Ellison, 1983; Howden, 1992; Kass Friedman, Leserman, Zuttermeister, & Benson, 1991; Lindgren & Coursey, 1995). Connection is a term used to describe one's link with outer and inner environments. More than just a perspective on the self, from the view of spirituality, the connection is a deep affirmation of one's belief in a personal association with outer resources (perhaps a higher power) that can affect inner processes. Such a belief is an expression of one's conviction that individuals can find peace even when faced with extreme adversity. Importantly, it must be noted that this peace is facilitated by being connected with oneself and humanity. Koenig also emphasizes connection as an aspect of a spiritual approach to pain management, as can be seen from the description above. Unfortunately, no authors have identified any specific measures to use in operationalizing this model for research purposes.

Howden (1992) has operationalized such definitions of spirituality by employing terms such as Innerness and Transcendence. Innerness is described as having feelings of wholeness, calm, serenity, empowerment, and peace with oneself and the world. This definition seems to capture Koenig's conception of acceptance from a spiritual standpoint as well as some aspects of the concept of connection with one's inner environment that have been discussed above. Transcendence is viewed as the ability to reach beyond the

limits of everyday experience in deriving the capacity to overcome bodily or psychic conditions in achieving self-healing (Howden, 1992). This definition seems to capture outer aspects of connection described above. As will be expanded upon in a later section, such descriptions of spirituality may be useful in describing and understanding mindfulness practices.

As noted earlier, many measures have been designed each differing based upon the originating definition and conceptual framework. Some measures incorporate religiously oriented terminology (such as God or prayer), while other measures assess spirituality without using religious language. As was noted previously, while some people equate or include spirituality with religiousness, others choose to describe a sense of spirituality without ascribing to any religious doctrine. However, core aspects of spirituality can still be assessed without calling upon religious ideology. In other words, one can assess spirituality without measuring religious behavior or identification with religious doctrine. Especially within populations that distinguish between religion and spirituality, and identify with the latter, measures of spirituality free of religious terminology can be seen as having distinct advantages over other religiously laden (in terminology or in ideology) spirituality scales.

While a number of spirituality scales are available, only some have received adequate psychometric investigation. Therefore, information related to population norms, scale reliability, and measure validity are available for some but not others. Additionally, many of the available spirituality scales have been utilized in North American settings, with limited application in other cultures. These shortcomings serve

to emphasize the need for research that uses available research tools in assessing spirituality and to establish available tools within different cultural settings.

Spirituality and meditation

Meditation has been a part of Eastern traditions such as Buddhism for centuries (Bonadonna, 2003). Such traditions have utilized the benefits of meditation for a variety of purposes but have been focused less upon the details of how meditation works. More recently, individuals from Western societies have taken the teachings of Eastern philosophy and meditation leaders and applied these techniques within their own lives. Some medical and psychological researchers have attempted to investigate and evaluate the positive affects meditation reportedly has in coping with disease states. Such attempts have generally been positive (Baer, 2003). However, the explanations for such affects reflect a fundamental difference in the way that meditation is viewed in the West as opposed to the East. While Eastern traditions have incorporated spiritual and physical philosophical viewpoints in understanding meditation, Western conceptualizations have tended to separate the two (Dimidjian & Linehan, 2003). This has resulted in two major outcomes. The first is that meditative practices tend to be viewed as relaxation techniques rather than spiritual practices (Marlatt & Kristeller, 1999). Such conclusions, while partially true (meditative practices do induce a relaxed state), are overly simplistic. As demonstrated in a study by Dunn, Hartigan, and Mikulas (1999) comparing EEG readings, meditation produced different EEG readings compared to those for relaxation. Seeing meditative practices as relaxation exercises does not acknowledge the broad range of affects practitioners of meditation report. Second, in attempting to understand the results of studies involving meditation, the reasons for positive outcomes have been

disconnected from spirituality. Physiological and psychological explanations for these findings have been posited, yet spiritually oriented explanations have been ignored or dismissed more often than not.

There have been some recent attempts to understand the relationship between spirituality and meditation using empirical research. One study by Wachholtz and Pergament (2008) found that spiritually oriented meditation (having a spiritual statement to focus upon) was significantly more effective than secular meditation (having a non-spiritual statement to meditate upon) in controlling migraine headaches and in reducing negative affective symptoms. These researchers concluded that spiritually based meditation had an additional effect in controlling headaches and reducing negative emotion. Dobkin (2008) also published a study on the use of meditative practice with cancer survivors. In this qualitative study, the author found that in following a meditation program, participants described acceptance, control, openness, and connectedness as key aspects of the experience. These descriptors are utilized frequently in definitions of spirituality. Indeed, Mackenzie, Carlson, Munoz, and Speca (2007) identified spirituality as a major theme identified by patients in a meditation based treatment process. There would appear to be building evidence for the role of spirituality in understanding the benefits gained through using meditation in treatment programs. To explain the research findings linking spirituality and meditation, an understanding of some of the different types of meditative practice is useful.

Meditative practice

Meditation has been defined as the intentional moment-to-moment self-regulation of attention (Kabat-Zinn, 1982). There are two generally accepted forms of meditation,

one using concentration and the other mindfulness. Concentrative meditation involves focusing of the individual's mind on a single stimulus, with the active exclusion of all other aspects of the person's inner and outer environment. The individual chooses a particular focal point of concentration, whether a word or physical attribute, and actively works to exclude all other thoughts, sensations, and experiences from causing a distraction. Mindfulness on the other hand refers to "...the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). In mindfulness meditation, the individual uses a stimulus as a focal point but notices and acknowledges other intrusions into the consciousness. Evaluation and judgment are minimized and replaced instead by an awareness of intrusions and the gentle acceptance of these aspects of consciousness, and coupled with the gentle return to the focal point. Intrusions are not blocked actively from awareness. Instead, they are noticed through practice but prevented from distracting one from the present moment.

While meditative practices have formed the basis within Eastern contexts for the exploration of the self; within Western contexts, meditative practices often have been divorced from their spiritual roots. This is especially so within clinical settings that has been reluctant to acknowledge spiritual aspects of the person for the reasons already discussed.

Mindfulness meditation

Mindfulness as a meditative practice has a long history in a variety of religious and spiritual traditions. These include Hindu, Buddhist, and Thai traditions, and all have influenced the progress of mindfulness in North America as various teachers have

explored and trained in meditative practice under teachers from these traditions.

Buddhist teachings have been most influential, as noted by Kabat-Zinn (1990). Thich Naht Hahn has also been influential in the development of North American perspectives on mindfulness meditation and has brought Zen and Theravaden principles to his brand of meditation. Marsha Linehan, Kabat-Zinn and others draw from various Zen traditions in grounding their mindfulness based clinical interventions (Kristeller, 2009).

Kabat-Zinn (2003) traces mindfulness roots, as applied in this teaching of mindful meditation, to “the heart of Buddhist meditation” (p. 146) as a method, that one can come to understand the nature of the human condition. He notes that while attributing the method he utilizes to the Buddhist tradition, the essence is universal and not specific to any tradition. He also notes that actual practices of mindfulness vary from tradition to tradition and this is a context that he acknowledges as important in order to sensitively understand and evaluate the elements of mindfulness practice.

Christopher, Charoensuk, Gilbert, Neary, and Pearce (2009) review conceptualizations of mindfulness meditation comparatively from Eastern (Thai) and Western (US) perspectives. They note important differences that stem from the cultural understanding and grounding that exists in Eastern traditions that may be absent in the secular understanding most prominent in Western conceptualizations. These authors note that Thai culture is infused with teachings aligned with and drawn from Buddhist traditions that ground the Thai practice of mindfulness. As a result, they question the understanding and theories from Western conceptualizations and suggest that perhaps there is a strong psychological influence in the West. They note the presence of a more balanced approach in Eastern practices and understanding. This strong psychological

influence impacts the way researchers understand, investigate and define mindfulness meditation. This observation would leave open the role and elements of spirituality to understand the mechanisms of mindfulness meditation in how benefits are achieved.

While disconnecting the spiritual context from the practice of Mindfulness Meditation (MM) may increase the palatability of the activity in Western scientifically oriented culture, it also limits an appreciation of an understanding of meditative practices. Dimidjian and Linehan (2003) noted this dissociation between the practice of MM and spiritual roots and have expressed a view that if such a link were reformed, the insight gained from the centuries of experience that Eastern religions have accumulated could be used to guide the research directions for the study of mindfulness meditation.

Additionally, Marlatt and Kristeller (1999) stated that “one of the foremost challenges for future understanding of how meditation as part of the therapeutic process relates to spiritual growth and development” (p. 81). The importance of developing an understanding of MM as an aspect of spiritual development needs recognition.

One of the foremost proponents of MM has been Jon Kabat-Zinn. His research group has used mindfulness meditation to treat a variety of stress related conditions. The groups he has worked with have shown significant positive clinical affects in the treatment of chronic pain. According to Kabat-Zinn, one of the primary purposes of mindfulness practice is to develop insight into daily life as it actually exists. This can be achieved through the development of, as Buddhist philosophy refers to, detached observation or bare attention. This insight requires the registration of phenomena on a moment by moment basis and without gross distortion or judgment (Kabat-Zinn, Lipworth, & Burney, 1985). In this way, participants in a mindfulness group are

instructed to notice thoughts and feelings that arise, but return their focus to the present moment and avoid being absorbed into the content of the thought or feeling (Baer, 2003).

Applied to the perception of pain, detached observation involves separating the primary biologically based sensations carrying the pain signal from the cognitive interpretations one makes about the sensations. In practice, the meditator is encouraged to notice and observe pain within his or her body but to refrain from judging the sensation. Thoughts that may (and probably will) arise because of the pain, form another point to notice but, again, are not judged. Accepting the presence of such stimuli promotes an individual stance toward the self that is non-judgmental and accepting of one's inner experience. Through this process of observing pain signals, as well as the thoughts and feelings that automatically arise from one's interpretation of these signals, one develops the ability to de-link the sensation from the thoughts. In this way, the individual is able to notice the thought as evaluations that happen with some automaticity but then interrupt the process from carrying along as it would normally.

This process also allows for the separation of the sensation, the thought, and the reaction from the person, allowing the practitioner to let go of the automatic interpretation or response and to create space for something different (Williams, Teasdale, Segal, & Kabat-Zinn, 2007). Kabat-Zinn (1990) has indicated that the experience of pain during meditation can be seen as opportunities to manage pain in a different manner than before, thereby providing practice for the management of pain in other situations in a similar manner to that in mindfulness practice.

The work of Piira, Hayes, Goodenough, and von Baeyer (2006) noted earlier might have some relevance here as these authors noted that sensory-focusing strategies

appeared to be useful for adolescents learning to manage pain. They hypothesized that perhaps the ability to separate sensory from cognitive aspects of pain could play a role. This process would appear similar to the practice encouraged in mindfulness.

Current issues in mindfulness meditation

Meditation practice time length.

Familiarity with mindfulness requires some practice. However, how much practice is needed while receiving training in mindfulness varies by author. Typically, as outlined in his book, Kabat-Zinn recommends practicing mindfulness meditation for at least 45 minutes per day. While this number does not appear to be provided as a hard rule, Kabat-Zinn has stated that entrants into the mindfulness practice groups are required to practice in between sessions for this amount of time. In an attempt to test the importance of this set time, Sagula (2000) conducted a study investigating the need for extended practice sessions. The author conducted two groups utilizing the same 8-week program but varying the practice time required from each group. One group practiced for 45 minutes per day (as recommended by Kabat-Zinn), while a second group practiced for 20 minutes per day. Participants were assigned randomly to each group. No significant differences in measured outcomes (such as reduced depression or anxiety) were noted at the end of the 8-week group program. Both groups demonstrated significant reductions in outcome measures over a wait-list control group. While pain was qualitatively measured, quantitative changes in ratings were not discussed in this study, although reports of qualitative reductions in pain were noted. Additionally, differences were noted in the number of individuals choosing to dropout from the groups, with members of the

45 minute practice group showing reduced dropout than members of the 20 minute practice group. While the author did not explain this difference, one explanation is that the dropout rate could have been impacted by possible early benefits of increased practice in the 45-minute group.

In contrast, Dialectical Behavior Therapy (DBT) as presented by Linehan does not prescribe a set amount or frequency of practice. Issues such as these are left to the discretion of the therapist and client (Baer, 2003). In addition, Linehan's DBT provides a number of mindfulness based meditative exercises for clients to choose from, further validating the importance of the process of mindfulness over the actual exercise used. Indeed, Carmody, Reed, Kristeller and Merriam (2008) found no significant relationship between outcome measures and amount or type of home practice used. Carmody and Baer (2008) note that given the competing demands on the time of participants in mindfulness-based programs, "the disclosure of the expectation of lengthy out-of-class practice may act as a barrier to participation for some" (p. 25). Therefore, it does not seem that a set routine or regimen has proven as essential or having greater efficacy. As Roemer and Orsillo (2003) note, the costs and benefits that relate to varying amounts of required practice need further investigation.

Instructor practice.

Another issue that remains unresolved with MM is the need for instructor use of mindfulness meditation. Some groups (including Kabat-Zinn's group) recommend that the instructor of the meditation group have some regular meditative practice themselves. Others have noted that the important factor that aids in a successful outcome is the formulation of the problem and the way that MM can help within this formulation. It is

essential that this formulation be shared with the clients, who can then better understand their own process of change (Teasdale, Segal, & Williams, 2003). How this formulation is understood and conveyed can vary, but the conveyance of this understanding is viewed by these authors as important. For the purposes of this study, both instructors were familiar with mindfulness and maintained ongoing practices. This aided in the ability of each clinician to articulate the relevance of mindfulness to the group. However, no specific requirements regarding regularity of practice were outlined because there is a lack of consensus regarding the need for this requirement.

Mindfulness meditation and chronic pain

Jon Kabat-Zinn has utilized MM with individuals affected by a number of chronic conditions. In one study, Kabat-Zinn (1982) reported significant decreases in reported pain for subjects trained in MM. Reductions in subjective reports of pain (as measured by the McGill Pain Questionnaire) were as high as 50% over a 10-week training period for half of the subjects in the study. This study did not incorporate a control group, and the participants entered the training with a variety of pain complaints. However, this study does suggest the potential benefits of mindfulness meditation as a pain reducing intervention.

Other studies cited in an article by Baer (2003) demonstrated equally promising results. Baer states that “in general, findings for chronic pain patients show statistically significant improvements in ratings of pain, other medical symptoms, and psychological symptoms. Many of these changes were maintained at follow-up evaluations” (p. 134). Baer notes that the age group most often studied has ranged from 38 to 50 years, with a mean of 45 years.

Mindfulness meditation and depression or anxiety

Mindfulness meditation has been utilized in the treatment of depression. Ma and Teasdale (2004) conducted a study where recurrently depressed patients were randomly assigned to treatment as usual versus treatment as usual plus mindfulness based cognitive therapy (MBCT). These authors found evidence for the utility of MM in relapse prevention for individuals suffering from three or more previous major depressive episodes. While this study limited the sample to patients with recurrent major depressive episodes, Fennell (2004) suggested that MM could also benefit individuals with low self-esteem. Describing his work with two individuals, Fennell comments on the utility of MM in positively changing internal experiences related to self-esteem. Mason and Hargreaves (2001) studying a small sample of individuals with depression noted that the development of an “attitude of acceptance” (p. 197) was identified through qualitative analysis of interviews as being an important area for change. It should be noted that the study conducted by Ma and Teasdale (2004) focused upon relapse prevention. While these authors found the greatest clinical benefits from the use of MM in patients with three or more episodes of depression, the inclusion criteria for their study limited the conclusions that could be drawn for treatment efficacy in individuals with non-recurrent major depressive disorder or active depressive symptoms. The authors also did not sample participants with concurrent medical conditions. They conclude that the utility of mindfulness meditation within the context of broader depressed patient populations “remains an open question” (Ma & Teasdale, 2004, p. 38).

Mindfulness meditation has also been utilized in the treatment of anxiety and stress. Tacon, McComb, Caldera, and Randolph (2003) studied 20 women (diagnosed

with heart disease) enrolled in an 8-week MM group for anxiety reduction. The 20 participants were assigned randomly to either an intervention or a control group. Significant benefits were noted in the intervention group in reductions in anxiety. Similar results were reported in a study by Kabat-Zinn, Massion, Kristeller, Peterson, Fletcher, Lenderking, and Santorelli (1992) with sustained gains at three month follow-up.

An article written by the Melbourne Academic Mindfulness Interest Group (2005) summarized some possible negative effects from the practice of mindfulness meditation. These authors noted that few negative effects were reported, few studies had been conducted exploring the adverse effects of meditative practice, and the most adverse effects noted came from transcendental meditation. These authors note that MM requires time to practice and this cost is an important consideration. Additionally, these authors note the side effect occurrence as related particularly to extended or long-term retreats (10 days or more). They also note that while further research is required, acute psychotic episodes, or a history of psychosis might contraindicate longer term or intensive meditative training. Other adverse effects reported included meditation-induced anxiety, lowered motivation, impaired reality testing, boredom, pain and confusion. These authors note the low rate of reporting of such adverse events and the possible relationship with internal observation of positive and negative internal events that is encouraged by the practice of mindfulness meditation. The authors state that these events would be expected to be short-term as well as transient and could be mitigated by the practice of mindfulness meditation within the context of guided instruction.

Mechanisms for Mindfulness

Various mechanisms, based upon existing modes of chronic pain management, have been posited to explain the effects of MM training. Baer (2003) reports on some of these mechanisms. One theory holds that relaxation is the primary mechanism of action of MM. However, as noted earlier, EEG studies have differentiated meditative states from relaxation states. Further, MM does not focus upon relaxation as a primary state or goal. Instead, MM encourages the person meditating to avoid setting expectations and experience the relationship they have with their thoughts. Experiencing one's thoughts in a non-judgmental manner is encouraged as a basic principle (Roemer & Orsillo, 2003).

Another mechanism reported by Baer (2003) involves cognitive change. Authors presenting this theory describe the process of objective monitoring of thoughts and one's own relationship and reaction to these thoughts as similar to that achieved in cognitive therapy. As outlined earlier, cognitive therapy assists the individual in evaluating and testing thoughts and beliefs as helping or hindering the management of pain. That is, maladaptive thoughts are tested and adjusted to become more realistic and helpful in the process of pain management. While monitoring of thoughts and sensations is taught in the practice of mindfulness meditation, the evaluation of such thoughts and sensations is explicitly not encouraged (Baer, 2003). In fact, the process of meditation from a mindfulness perspective encourages the non-judgmental acceptance of thoughts. Mindfulness can be seen as enabling an awareness of thoughts that previously would have been acted upon automatically. Such thoughts are brought into awareness with acceptance and non-judgment, thereby reducing the impact of these thoughts and increasing the likelihood that they will be seen as thoughts and not truth. Quieting the stream of thinking in such a manner also generates a sense of peace and tranquility that

enhances the process of detached observation and acceptance of the moment. Different thoughts (thoughts that might sit in opposition to the automatic thoughts) are given room to enter into awareness (Williams, Teasdale, Segal, & Kabat-Zinn, 2007). While not ruling out the possibility of cognitive change, the mechanism by which cognition is changed is theoretically different from that engaged through cognitive therapy.

Another theory proposes the development of acceptance skills as a mechanism for mindfulness. Hayes (1994) defines acceptance as “experiencing events fully and without defense, as they are” (cited in Baer, 2003, p. 130). Defined in this way, it seems plausible that the non-judgmental stance encouraged by mindfulness meditation and taught in the practice of mindfulness would instill or enhance self-acceptance in the practitioner.

Shapiro, Carlson, Astin, and Freedman (2006) offer a model of mindfulness that incorporates the relevant constructs into a single model. They describe three parts of the model that include intention, attention, and attitude as interwoven aspects of the process of mindfulness. Intention is described as setting the stage for what is possible. This forms the “why” of one’s practice and describes a continuum of intention from self-regulation to self-exploration and eventually reaching self-liberation. Intention is also described as approaching mindfulness practice “on purpose” (p. 375). Attention describes the second fundamental component of mindfulness as “observing the operations of one’s moment-to-moment, internal and external experience” (p. 376). Attention in this respect is attending to experience itself in the here and now. Some also use the term alluded to earlier, “bare attention.” Attitude is the third component and describes how one attends in mindfulness practice. Attitude is seen as essential and described as

attending to one's internal and external experience, without judgement or interpretation, and with acceptance, kindness, and openness. This attitude is supported even when the experience is seen to be in contrast to one's wish or belief.

Shapiro et al. (2006) go on to state that these three components of mindfulness combine in an interactive way to result in re-perceiving, a "meta mechanism of action" that leads to positive outcomes. These authors also note that part of the process of attending with purpose leads a person to connect with one's inner experience that then leads to self-regulation and ultimately to improved health. Through this model, Shapiro et al. (2006) attempt to describe how the various aspects of mindfulness fit together. However, as noted previously in this literature review, some have found that based upon cross-cultural studies, Western views of mindfulness appear to be strongly psychologically influenced and perhaps under-represent the role of spirituality in understanding the how health benefits are derived (Christopher et al., 2009).

Carmody, Baer, Lykins, and Olendzki (2009) attempted to validate the model described above. These authors found only partial support for the role of re-perceiving in the psychological benefits of mindfulness training. They also noted that, while the various aspects of intention were rated highly, they did not appear to be significantly linked to positive outcomes. They note several shortcomings of this research, including reliance upon self-report measures from self-referred participants (approximately half of the sample) who agreed to the use of their data for publication. This might have introduced a positive response bias. Also, some of the measures used in this study had not been validated fully at the time of data collection and have since been revised. Therefore, newer versions might more validly assess key variables in this study. It is

relevant to the present study to note that Carmody, Baer, Lykins, and Olendzki did not include any measure of acceptance, an important ingredient in the model given above.

As discussed earlier, many writers theorize that acceptance is central in the application and understanding of mindfulness. In the context of the discussion by Christopher et al. (2009), and the emphasis on a psychological understanding of mindfulness within a Western perspective, spiritual acceptance might prove to be a fruitful area of investigation to understand better the underlying mechanisms of MM.

Measures of acceptance that use psychological definitions do exist. The Acceptance Action Questionnaire was designed to measure a person's ability to accept undesirable thoughts and feelings in order to engage in a goal-directed behavior despite the presence of difficult private experiences (McCracken, Zhao, & O'Brien, 2009). Unfortunately, measures of acceptance from a spiritual perspective are extremely limited and none was found with a specific scale that could be utilized for research. However, Howden's (1992) concept of Innerness seems to capture this conceptualization.

The role of Innerness

Innerness as an aspect of spirituality has been described as having feelings of wholeness, calm, serenity, empowerment, as well as peace with one's self and the world. This definition has similarities with the way that some have described the process of mindfulness as well as some of the research findings relating to mindfulness. Shapiro et al. (2006) described acceptance as one of three elements of their model of mindfulness. Christopher et al. (2009) noted that Western conceptualizations of mindfulness perhaps overemphasized psychological definitions at the expense of more spiritual understandings. Koenig (2003) described acceptance from a spiritual perspective to

involve finding peace and serenity in the face of unremitting pain. Descriptions that include peace, serenity, non-judgment, quietness, and observation appear to fit with Howden's description of spiritual Innerness. Therefore, through the teaching of mindfulness, and the practice of being mindful, one might expect there to be a measurable increase in the level of Innerness from a spiritual perspective within the individual. Indeed, Dobkin (2008) found that acceptance, mindful control, and the possibility for change were important aspects of the self-reported experience in a group of cancer survivors who received training in Mindfulness Based Stress Reduction. Additionally, in the only study found linking mindfulness and spirituality, Carmody, Reed, Kristeller, and Merriam (2008) discovered improved spiritual well-being (as defined by a sense of inner meaning and peace) occurred as a function of mindfulness meditation, even when presented in a secular setting. Therefore, a link between spiritual well-being and instruction in mindfulness practices can be shown. Unfortunately, these authors chose a definition of spiritual well-being that was somewhat specific. Aside from specific faith based questions, the measure only asked questions related to peace and meaning. Areas related to serenity, calm, strength, empowerment, and wholeness were not measured. Additionally, other themes of spirituality related to interconnectedness and transcendence were not a part of the questionnaire. The authors also noted the lack of a control group in their study, limiting the ability to compare changes in scores with a comparison group. Finally, the outcome measures for this study included general health related measures, and the population did not specifically include individuals experiencing chronic pain. Despite these limitations, this research demonstrated the presence of a link between mindfulness and spirituality. This research reflects the growing interest in the

development of spirituality through the teaching of mindfulness meditative practice in the treatment of various medical issues.

The current study

The current study attempted to examine the nature of the change that occurs when mindfulness meditation is used within the context of chronic pain management. As has been proposed by other authors (Dimidjian & Linehan, 2003; Carmody et al, 2008), spirituality is thought to have a role in the benefits reported by individuals who have received mindfulness training. Therefore, spirituality was measured, and changes in reported levels of spirituality were examined for correlation with outcomes of pain management. Goals of this study included the collection and examination of data assessing the role that spirituality may play in relation to therapeutic gains reported when using MM as an intervention. This study was conducted with groups receiving MM training in conjunction with standardized group-based chronic pain psycho-education. In order to address the limitations of previous studies, a control sample of individuals who received only the group-based psycho-education served as a comparator for this study. Within this context, this study measured the difference in reported pain between one group of participants who received only group-based psycho-education, and a second group who received a combination of this standard treatment with instruction and practice in mindfulness.

It was hypothesized that the pain ratings, as measured by the McGill pain questionnaire (the dependent variable), of individuals in the standard care plus mindfulness group (referred to as the mindfulness group) would be lower than the pain ratings from participants in the psycho-education only group (referred to as the control

group) once group training was completed (hypothesis one). Type of group was the independent variable.

As can be seen from the literature presented above, one might also expect spirituality to be impacted by the opportunity to learn and practice mindfulness. In order to test this possibility, hypothesis two stated that the change in overall spirituality (as measured by the total score on the Spiritual Assessment Scale; the dependent variable) would be higher in the mindfulness group when compared to the control group, once group training was completed. Type of group was again the independent variable. Additionally, it was hypothesized that changes in spirituality would be significantly inversely correlated with changes in pain ratings (hypothesis three).

As was noted in the literature reviewed, one would also expect Innerness from a spiritual perspective to play an important role. Hypothesis four stated that Innerness, especially changes in Innerness as measured by the Spiritual Assessment Scale (SAS), would predict changes in pain ratings, as measured by the McGill pain questionnaire.

Finally, chronic pain has been shown to have a significant impact on emotion. It was hypothesized that spirituality would be inversely correlated with changes in measured depression (hypothesis five) and anxiety (hypothesis six), as measured by the Hospital Anxiety and Depression scale.

Method

Participants

Participants for this study comprised 54 consecutive patients seeking services from the Multidisciplinary Pain Clinic (MPC) at the University of Alberta Hospital,

Edmonton, Alberta. Individuals were told that they had the option of attending a group-based pain program that would provide information and support related to various aspects of pain management and daily functioning. As part of informed consent, they were told that they would be asked to complete various survey forms that ask questions related to their pain and various psychosocial aspects of their lives including mood issues, interpersonal difficulties, and spirituality.

Materials

The structure for the control groups in this study was based upon an eight-week psycho-educational group process already in place at the University of Alberta Hospital MPC. The topics covered include biological as well as psychosocial aspects of pain, relaxation, activity pacing, managing negative thoughts and feelings, stress and anxiety management, pain behavior and communication, and setback planning (see Appendix F for description). The content of all group sessions was incorporated into a PowerPoint presentation in a point-by-point style to standardize the presentation, and copies of slides were provided to each participant.

The groups that incorporated mindfulness training received the same instruction with the addition of specific didactic and experiential mindfulness components. As mentioned earlier, Dr. Jon Kabat-Zinn has developed a large body of work describing the process of bringing MM into clinical practice. He has conducted many groups incorporating mindfulness practice and teachings into the treatment of a variety of conditions including chronic pain, psoriasis, cardiovascular functioning, anxiety, and depression. He has attempted to articulate the fundamentals of mindfulness meditation and the eight-week program at the University of Massachusetts in his book Full

Catastrophe Living: using the wisdom of your body and mind to face stress, pain and illness (1990). As stated in this book,

We provide you with specific recommendations for getting started in your own daily mindfulness practice based on exactly what we do with the patients in the clinic. In this way, as you continue to move through the rest of the book, you can also be practicing as you would if you were enrolled in the clinic. (p. 140)

As noted above, previous studies have shown that various changes to the structure of the Kabat-Zinn eight-week course have been shown to be possible without diminished clinical gains. Therefore, this study incorporated the basic elements of the MBSR training process throughout the eight-week psycho-educational program but also adjusted the program described by Kabat-Zinn, to enable its incorporation into the standard program and to allow comparison between the two treatment groups. A detailed outline is included in Appendix E.

In summary, session 1 was dedicated to introductions and basic educational elements as well as requirements of the eight-week process. Basics of Gate Control Theory were provided along with explanations of differences between acute and chronic pain. Issues related to the use of medications were reviewed as were myths related to chronic pain. Homework included review of the materials presented.

In the mindfulness groups, a didactic introduction to the seven basic attitudes of mindfulness practice was provided along with an experiential introduction to mindfulness meditation through the “Raisin” exercise. These two aspects of mindfulness practice (educational and experiential) served as the basis for discussion in this and later group

meetings. Daily mindfulness practice was strongly encouraged. Homework included review of the materials presented as well as daily mindfulness practice.

Session 2 involved reviewing the group's experience at the previous session and over the subsequent week of practice. Instruction on the nature of stress as well as relaxation techniques was provided. Various types of relaxation techniques were discussed and diaphragmatic breathing was practiced.

In the mindfulness group, breath focused relaxation techniques were distinguished from a mindful breath exercise. An elaboration on the connection between mind and body was provided, as was a discussion of how mindfulness could be useful in managing chronic pain. Then a breath exercise was taught and practiced as a prelude to at-home practice. Individual questions and comments were sought and responded to.

Session 3 started with a discussion of questions from the previous session and participant experience with the relaxation strategies discussed in the preceding session. Activity pacing was described, and the application to various activities was taught. Group participants were shown how to calculate tolerance levels, baselines, and progress rates, and various examples were utilized.

In the mindfulness group, the discussion of the practice of mindfulness and its relationship to chronic pain management was continued with further elaboration of the seven principles outlined by Kabat-Zinn (1990). Particular issues of mindfulness practice while experiencing chronic pain were discussed, as well as an initial discussion of acceptance. The body scan technique was discussed and practiced.

Session 4 started with a review of homework, participant attempts to pace activities, and obstacles to pacing. There was also discussion of problem solving of

obstacles. The relationship between negative thoughts, mood, and chronic pain was presented. The topic of managing negative thoughts was reviewed and thought diaries introduced.

In the mindfulness group, session 4 broadened the types of mindfulness meditative practice possible to include mindful participation in activities. It was tied in with the previous session's discussion on pacing and it was emphasized that each person should decide for him/herself what type(s) of mindfulness activities he/she should use. Mindfulness and non-judging were typically discussed and the group finished with a mindful walking exercise.

Session 5 started with the acknowledgment that the group was entering into the final four meetings. After discussing questions and comments that arose from practice or readings, and a review of thought diaries, the group reviewed and discussed stress and anxiety as related to chronic pain management.

The mindfulness group also included a discussion of the role of mindfulness in pain and life management. The group then further elaborated on the nature of acceptance (a discussion initiated in previous sessions), and how mindfulness practice could be useful in building awareness and acceptance within oneself. There was also a discussion of the impact of the conscious placement of attention on emotion and how this impacted pain management. The possibility of observing emotions and thoughts was discussed, as was the principle of letting go from a mindfulness perspective. As in Kabat-Zinn's book, the body scan meditation was replaced by longer sitting meditations or walking meditation exercises.

Session 6 commenced with each participant's observations from the previous session, dealing with questions arising from the materials, and a review of practices. The group discussion initially focused on the effective communication of pain, pain behavior, and the role of pain behavior in significant interpersonal relationships. The group then discussed the impact of different communication styles in the context of chronic pain.

The mindfulness group then focused on the mindfulness paradigm discussed by Kabat-Zinn. Topics included a reminder of the biopsychosocial model, interconnectivity of the various parts of the model, and holistic healthcare. Discussion also focused on the management of difficult emotions and the non-judgmental stance taken in mindfulness. A mindfulness perspective on managing reactions and observing experience as it happened as opposed to based on expectations was also reviewed. This also was linked with communication. During this discussion, emphasis was given to how emotions might fluctuate and noticing the emotional change without passing judgment. The group ended with a mindfulness exercise.

Session 7 was the second-to-last group session and introduced the idea of setback planning. Each person was encouraged to design an individualized setback plan for use when pain management became more difficult and life stressors increased. Previous group session topics were reviewed and ideas for inclusion of these in a setback plan were generated. The group also spent time discussing the fact that the next meeting would be the last.

The mindfulness group also discussed taking different perspectives on various situations and how this could be a useful tool in pain management. Acceptance as separate from "liking" was discussed and further elaboration on experience, as it is,

especially painful experiences, was provided. The influence of the deliberate placement of attention was reviewed with emphasis upon how the mindfulness process could be one avenue toward managing attention in a different way. Individuals were encouraged to share examples of increased awareness of thoughts or emotions linked with his/her chronic pain or interpersonal lives. Practice was encouraged with emphasis upon finding a meditative practice that was comfortable for each individual. In-group practice was a quiet, unguided activity. The group also spent time with the fact that the next meeting would be the last. This initiated some discussion of what to do after the group finishes and how to maintain a daily, mindfulness practice.

Session 8 was the last meeting. Questions and comments were encouraged and specific remarks related to the group process elicited. Various miscellaneous topics were reviewed along with strategies for maintaining ongoing implementation of the various topics discussed over the eight sessions. Each group member was provided an opportunity to discuss questions, comments, and what he/she felt they had learnt from group. Each group member was encouraged to bring closure to the group in his or her own way, whether silently or through some form of comment.

The mindfulness group discussed challenges faced in maintaining a mindfulness practice. Each group member was encouraged to bring closure to the group in his or her own way, whether silently or through some form of comment, but emphasis was placed upon, as Kabat-Zinn (1990) put it “the eighth week lasts the rest of your lives” (p. 145).

Measures

Demographic questionnaire.

Basic, relevant demographic data was collected from each of the participants in this study. This data included age, gender, time since diagnosis, pain location, and active medical intervention (including medications) and was utilized in order to control for potential covariates. Furthermore, answers to questions related to frequency of prayer and meditative practice (prior to this study), belief in a higher power, and practice of yoga were gathered where possible.

Spiritual Assessment Scale.

The SAS (Appendix B) was published in 1992 as a measure of spirituality for nursing and other medical research. The SAS is an operationalization of a definition of spirituality that incorporates purpose and meaning in life, presence of inner resources, and feelings of interconnectedness and transcendence (MacDonald et. al., 1995). According to McDonald et al., the scale was developed from a healthcare perspective (primarily nursing) with definitional input from areas of philosophy, sociology, psychology, theology, and nursing. The current scale is a 28-item scale with four subscales, including unifying interconnectedness (nine items), purpose and meaning in life (four items), inner resources (nine items), and transcendence (six items). In defining unifying *interconnectedness*, Howden (1992) speaks of a feelings of attachment to others and harmony with self and others. The concept of *purpose and meaning* in life represents the process of searching for or discovering a sense of worth, hope, or reason for one's existence. *Innerness* (inner resources), according to Howden, is manifested in feelings of

strength in times of crisis, calmness or serenity in dealing with life's uncertainty, guidance in living, being at peace with one's self and the world, and feelings of ability. This dimension of spirituality involves finding wholeness, identity, and a sense of empowerment. Lastly, *transcendence* involves the ability to go beyond the limits of usual experience and the willingness to experience a rising above of bodily or psychic conditions (Howden, 1992). The concepts of innerness and unifying interconnectedness are consistent with the core elements of spirituality discussed earlier. Innerness, specifically, can be theoretically linked to the theories of mindfulness meditation discussed earlier.

Reliability and validity studies conducted to examine the SAS have found reasonable internal consistency scores with coefficient alpha values of 0.92 for the entire scale and alpha scores ranging from 0.72 to 0.91 for the subscales. Factorial validity using principal components analysis yielded six components accounting for 64.8% of total variance. The Innerness subscale loaded heavily on two factors identified as innerness expressed through harmony, balance, peace, and relationship with a higher power and innerness leading to guidance and strength in times of difficulty. The unifying interconnectedness subscale was associated with two factors (connection to others and connection with life). Validity studies have reported that scores on the SAS are correlated positively with scores from a number of other scales measuring existential well-being (MacDonald et. al., 1999). A weak but significant relationship was found between the scores on the SAS and measures of religiousness but not with measures of religious attendance. Additionally, the presence of a recent crisis experience was not related to scores on the SAS. Howden (1992) reported a small but significant tendency

for females to score higher than males in her standardization sample. Given that this study is a repeated measures design, with each of the participants' scores being compared to his/her own scores, this consideration should not be a factor but will be noted for the descriptive summaries. Some validity studies were conducted and found no relationship between scores on the SAS and indices of recent trauma (MacDonald et. al., 1995). In addition, scores from the SAS were found to be negatively associated with the scores on the EGO scale, a measure of psychosis and grandiosity (MacDonald et. al., 1999).

One advantage of the SAS noted earlier is the absence of reliance upon any particular religious doctrine. Leigh, Bowen, and Marlatt (2005) note that the SAS did not have a significant correlation with attendance at weekly religious meetings. MacDonald et al. (1995) further note that this instrument shows great promise for research related to spirituality and physical, psychological, and social correlates. In addition, the definition of spirituality underlying the SAS subsumes many of the major theoretical and empirical areas associated with spirituality. Sample norms (although limited) are available, giving some information regarding the statistical properties of the SAS. Central to this study is Howden's inclusion of, and emphasis, on Innerness. It was felt that this variable would prove to be important in understanding pain management using mindfulness meditation. Out of the total 28 items in the questionnaire, nine are related directly to measuring Innerness. The SAS has also been used in studies exploring the relationship between Spirituality and Mindfulness (Leigh et. al., 2005)

Despite these advantages, the SAS is subject (to some degree) to many of the same shortcomings previously mentioned for other spirituality scales. These include usage in a limited number of cultural settings and a limited number of studies related to

psychometric reliability and validity. Despite these limitations, the SAS is a well recognized measure of spirituality and measures key aspects of spirituality relevant to this study.

McGill Pain questionnaire.

The McGill Pain Questionnaire (Melzack, 1975; Appendix C) was used to assess chronic pain at the start and end of the study. This measure was chosen for its well-established psychometric properties as well as its broad use in many of the studies conducted previously assessing pain in conjunction with mindfulness meditation (Kabat-Zinn, 1982; Kabat-Zinn et al., 1985; 1987; Morone, Greco, & Weiner, 2008).

The McGill Pain Questionnaire (MPQ) consists of a number of descriptors of pain that the respondent is asked to choose from in identifying and describing his or her pain. The descriptors are grouped into 20 sub-classes, each containing three to five descriptors ordered from least to most pain. Ten of the subclasses relate to sensory aspects of pain, five of the subclasses relate to Affective aspects of pain, one subclass relates to Evaluation of pain, and four subclasses are considered Miscellaneous descriptors that were identified as important in describing the full range of pain complaints. In addition to the descriptors, an 11 point pain rating scale (PPI) is used to measure present pain intensity from 0 (no pain) to 10 (excruciating pain). Separate Sensory, Affective, Evaluative, and Miscellaneous Pain Rating Indices can be calculated, as can the Total Pain Rating Index by taking the rank order value of the word chosen within each of the 20 subclasses and summing them together to achieve a single number. Summing the Sensory, Affective, Evaluative, and Miscellaneous values will provide the Total. This

number can be used in addition to the Present Pain Index that is simply a rating from zero to 11.

The psychometric properties of the McGill Pain Questionnaire have been discussed in a number of studies and are summarized in Melzack and Katz (2001). According to these authors, the test-retest reliability was shown to be very strong, with differences over time attributable to the fluctuations in pain quality seen in clinical settings. The division of the pain descriptors into three categories (with an additional miscellaneous category) has been investigated. Factor analyses of the MPQ have resulted in a number of factors being identified. The result most frequently reported and widely accepted is a three factor model with Sensory and Affective factors accounting for the largest proportion of variance. Indeed, the three factor model does not include the miscellaneous subscale, although the miscellaneous subscale is still included in the measure (Melzack & Katz, 2001). Some have questioned the need for and the reliability of the Evaluative and Miscellaneous subscales of the MPQ, given the high correlation and low predictive ability of the Evaluative scale when combined with the Sensory and Affective factors. In a recent article authored in part by Turk, the short form version of the MPQ was recommended for the measurement of pain outcomes (Dworkin et al, 2005). The short form MPQ has only the sensory and affective scales of the full version emphasizing the importance of the Sensory and Affective subscales and raising the question of the validity of the Evaluative and Miscellaneous subscales. However, the full version is still commonly utilized and contains the additional questions. The full version was utilized for this study.

An important aspect of an intervention study is the ability of the measures to detect changes in pain over the course of the intervention. Melzack and Katz (2001) report a number of studies that have compared the MPQ to visual analogue scales and other rating scales of pain intensity and have found the MPQ to be at least as sensitive as these scales to changes in pain intensity in post-operative situations as well as over the course of other pain reduction interventions. These authors state that the MPQ's multidimensional attributes may provide for increased sensitivity to changes in mild pain intensity due to the respondent's ability to describe pain in greater detail than that offered by visual analogue scales. As noted, the MPQ has been used in previous studies measuring the usefulness of meditation in pain management. Use of the measure in this study therefore enhances the cross study comparability of the results from this study.

Hospital Anxiety & Depression Index

The Hospital Anxiety & Depression Index (HAD; Zigmond, & Snaith, 1983) is a brief (14-item) measure used to assess current levels of depression and anxiety. This questionnaire consists of a list of 14 situations that describe how a person may feel on a regular basis, where seven items query depressive symptoms and seven query symptoms of anxiety. The patient is required to place a tick in the box next to the reply that comes nearest to how he/she has been feeling in the past week. Items are rated on a 4-point scale (0-3). Scores on each subscale range from 0-21. Cutoff scores are available and suggest that scores on either scale that are under 7 be considered normal, scores 8-10 be considered mild, 11-14 be considered moderate, and 15-21 be considered severe (Roemer, 2001). The scale is designed to reduce reliance upon somatically based symptoms for the identification of anxiety or depression thereby reducing the rate of false

positives in populations with concurrent medical issues. This is particularly useful when assessing individuals with chronic pain.

As noted by Zigmond and Snaith (1983), the psychometric properties of the HAD make it a reliable alternative to well established measures of depression and anxiety. When compared to clinical interview, the depression subscale had a false positive rate of 1% and false negative rate of 1%. The anxiety subscale had a false positive rate of 5% and a false negative rate of 1% when compared to clinical interview. Correlations were calculated between the subscales of the HAD and the clinical interview findings of the researchers. While significant positive correlations were found between individual subscales and interview findings for each disorder, small positive correlations were also found between the depression subscale and interview findings of anxiety, the anxiety subscale and findings of depression. However, neither of these small correlations was found to be significant and were therefore reported to indicate that the HAD subscales measured different disorders.

More recently, Bjelland, Dahl, Haug, and Neckelmann (2002) reviewed the literature reporting the psychometric properties of the HADS and supported these conclusions. They found that the internal consistency of the HADS was acceptable, exceeding the Cronbach's coefficient alpha threshold of 0.60 needed to be considered reliable. They reported a Cronbach's alpha of 0.83 for the anxiety subscale and 0.82 for the depression subscale. These authors also report that from their review of the literature, the two-factor proposed structure of the HADS found support, with most studies revealing "two relatively independent dimensions of anxiety and depression closely identical to the Anxiety and Depression subscales" (p. 74). The authors also stated that

any correlations found between the Anxiety and Depression subscales of the HADS should be considered within the context of the extensive comorbidity of the two disorders. Finally, the authors of this review article reported the concurrent validity of the HADS with various other measures of anxiety and depression. When compared to the anxiety subscale of Symptom Check List – 90 (revised; SCL-90-R) the anxiety subscale of the HADS was found to have a correlation of between 0.49 and 0.73 dependent upon the study reported. When compared to the Depression subscale of the SCL-90-R, the depression subscale of the HADS was found to have a correlation coefficient of 0.69. Overall, the authors found evidence for the strength of the HADS for assessing anxiety and depression in primarily somatic patient populations, psychiatric primary care patients, and in individuals from the general population.

Procedure

Pain management groups were held once a week at the Multidisciplinary Pain Center (MPC), University of Alberta hospital. Each group consisted of between four and eight participants. The groups ran for eight sessions (excluding statutory holidays that sometimes extended the group by one or two weeks). Ten groups were conducted (five control and five with mindfulness instruction). As this was a clinical sample, many individuals participating in the group process were taking prescribed analgesic medications. As a part of the standard clinical care, standard medical treatments were continued over the course of the groups. Given the structure of the pain clinic setting, changes to medical treatments were not always communicated to the group leaders and some participants for whom treatments may have changed were included in the study. No participants were excluded from either group other than those who did not attend

sessions. Individuals with varied pain etiologies were included in order to broaden the generalizability of the results of this study. Individuals with an Axis II disorder or active suicidal ideation and plan were not included in the study.

Assignment of participants to treatments

The group therapy process is the entry point for psychological services provided at the MPC. Therefore, patients on the waiting list (with rare exception) would not have received any psychological intervention for pain management from the MPC prior to entry into the group. Participants were recruited in consecutive order based upon their position on the MPC Psychology waitlist. Individuals were invited for an interview to gather additional information and to determine appropriateness and willingness to attend group meetings. If the individual expressed interest in a group based approach to pain management, he/she was enrolled in the next available group and provided preliminary information related to the study. They were also told that attending the group did not require participation in the study, as the group sessions were a standard part of clinical care. Groups were started in alternating order, control group followed by mindfulness group. Participants were unaware of the goals of the study and were not told the type of group (control or mindfulness) they were to enter. Prior to the first group meeting, study related information was provided this time by the group leader who was blind to the hypotheses of the study. The informed consent form and initial questionnaire were also provided and attendees were invited to read the information in their package. All group participants were asked to complete the questionnaires regardless of study participation. Attendees were provided clinic contact information that they could utilize if they had inquiries about the questionnaires. Attendees were reminded that study participation was

not a prerequisite for group participation and that the data would only be included in the study if they gave consent. Individuals agreeing to participate in this study were asked to complete and return the informed consent form as well as the questionnaire as soon as was possible. Reminders for the completion of the questionnaires were provided at the start of the first group sessions.

While not random, not notifying participants in advance of the type of group they were assigned to and alternating the type of groups offered, resulted in an assignment procedure that did not have a systematic bias. Given the clinic processes of the MPC, random assignment would not have provided timely access to treatment.

Each person then attended eight weekly group sessions, each two hours in length, conducted at the University of Alberta Hospital. Each of the sessions were conducted jointly by two clinical psychologists, one, the author of this study trained in mindfulness meditative practices, and the other, a registered doctoral level psychologist with specialized training in the area of chronic pain management who was blind to the hypotheses of the study. Treatment fidelity was monitored through the use of PowerPoint presentation slides that gave point by point direction of the subject matter to be discussed in group session. In addition, regular meetings between the co-therapists were held and the material covered from each session was reviewed to ensure the group discussion included all subjects and tasks outlined. The summary provided for each week's session was used as a guide for this manipulation check and the PowerPoint slides acted as a guide to ensure the same material was provided each time. The content of the control group sessions is outlined in Appendix F. The process was largely didactic with opportunities for group discussion and interaction. At the conclusion of the control group

sessions, the opportunity to attend another group series with mindfulness training was offered to all control group participants. Twenty of 29 participants took the opportunity once post group questionnaires were collected.

The mindfulness groups were conducted in the same way as the control group session with the addition of PowerPoint slides containing information related to the principles and practice of mindfulness meditation. Content for the mindfulness groups is presented in Appendix E. There was also an experiential component within each group session where guided mindfulness practice was taught. Treatment fidelity was monitored with PowerPoint slides in session and summaries of session content used during post group session review. For those in the control group arm of the study, no mention of mindfulness was made in group.

Table 1

Summary of treatment / intervention group content

Week	Control	Mindfulness
1	<ul style="list-style-type: none"> • Review participation guidelines & consent. • Group introductions, rules, norms. • Discuss Pain Gate Theory 	<ul style="list-style-type: none"> • Cover content from Control group plus: • Introduce mindfulness • Introduce seven attitudes as

	<ul style="list-style-type: none"> • Discuss Acute v. Chronic Pain • Discuss Biopsychosocial model • Briefly discuss medication and additions issues/myths • Discuss role of stress management 	<p>outlined by Jon Kabat-Zinn</p> <ul style="list-style-type: none"> • Practice raisin eating exercise • Encourage daily practice • Introduce record sheet for daily practice.
2	<ul style="list-style-type: none"> • Discuss role of stress and relaxation in pain management • Review relaxation techniques and stress management • Demonstrate and Practice diaphragmatic breathing • Introduce practice recording sheet • Q & A 	<ul style="list-style-type: none"> • Content from control group. • Review attitudes from previous wk • Discuss universality of wandering mind and noticing/observing where mind wanders • Encourage gentle return to focal pt and importance of acceptance • Introduce Mind-Body Connection • Introduce breath exercise • Discuss obstacles • Q & A
3	<ul style="list-style-type: none"> • Q & A • Discuss activity cycling and goal setting. • Review Pacing and calculation of Tolerance and Baseline levels for activities 	<ul style="list-style-type: none"> • Content from control grp; Q & A • Introduce Mind-Body Connection • Introduce Body scan exercise • Discuss non-judging attitude • Discuss role of awareness and Beginner's mind attitude

	<ul style="list-style-type: none"> • Review planning, prioritizing, pacing • Examples and Q & A 	<ul style="list-style-type: none"> • Practice body scan • Q & A and obstacles of practice
4	<ul style="list-style-type: none"> • Q & A • Discuss Thinking styles, negative automatic thoughts and feelings • Introduce thought diary • Examples and Q & A 	<ul style="list-style-type: none"> • Content from control grp; Q & A • Review challenges of practicing regularly • Avoidance and judgment of activity / pain • Discuss difference between reacting and responding • Discuss awareness of thoughts, non-judging, acceptance, letting go • Practice mindfulness exercise (Walking) • Q & A
5	<ul style="list-style-type: none"> • Q & A • Role of anxiety and stress in pain management • Review thought diaries and discuss coping thoughts • Review sleep hygiene 	<ul style="list-style-type: none"> • Content from control grp; Q & A • Experience of mindfulness thus far • Discuss observing, accepting, and letting go of emotion, thought • Emphasize process over outcome • Discuss attitude of patience

	<ul style="list-style-type: none"> • Q & A 	<ul style="list-style-type: none"> • Sitting meditation w/ observation of thought as events • Encourage body scan practice • Q & A
6	<ul style="list-style-type: none"> • Q & A • Pain communication and patterns of communication • Distinguish between active and passive communication styles • Discuss relationship to pain behavior • Examples; introduce worksheet for pain behavior • Q & A 	<ul style="list-style-type: none"> • Content from control grp; Q & A • Mind-body paradigm; wholeness • Biopsychosocial model and mindfulness • Experience “as it is” and aspects of experience that pull attention away from present moment • Mindfulness exercise (body scan) • Q & A; obstacles to practice
7	<ul style="list-style-type: none"> • Q & A • Discuss setbacks & setback planning • Creating an individualized setback plan • Review topics from group and role in setback plan • Q & A 	<ul style="list-style-type: none"> • Content from control grp; Q & A • Wholeness and mind-body paradigm • Role of patience and acceptance • Acceptance as different from liking • Pain as a distracter • Observation of pain and fluctuations in experience of

		<p>pain</p> <ul style="list-style-type: none"> • Whole body context for pain experience • Quiet mindfulness practice and experience • Q & A
8	<ul style="list-style-type: none"> • Q & A • Review previous 7 sessions • Discuss how to integrate material • Discuss how to maintain principles learned • Review set back plans • Final comments 	<ul style="list-style-type: none"> • Content from control grp; Q & A • Review seven attitudes of mindfulness • How to maintain momentum • Formal / informal practice • Other sources of information • Practice body scan • Final comments

At the conclusion of each control or mindfulness group series, every person was provided a package with the same questionnaires presented at the start of group to complete accompanied by a stamped addressed envelope in which to return the completed questionnaires. Individuals were asked to complete the questionnaires and to return them to the clinic or bring them to their next individual session. The research assistant followed up with reminder phone calls requesting completion of the questionnaires. Each participant was given a participant code number that provided for blind analysis of data and confidentiality of results. It was not necessary to break the

coding for any of the participants in this study. All data was collected, coded, and entered by a research assistant blind to the goals of the study.

Results

The data collected during the study was analyzed using the SPSS 11.0 data analysis software package with an alpha level of 0.05 for all statistical tests. Fifty-four participants completed the group treatment while seven individuals (13 percent of the sample) did not complete the program. Of this seven, three were from control groups and four were assigned to mindfulness groups. Reasons included geographic distance, other health conditions, and added life stressors. When comparing available demographic variables, non-completers did not differ significantly from those who completed the group. The rate of non-completion was consistent with that previously found (Carmody et. al, 2008; Wachholtz & Pargament, 2008; McCracken et. al., 2007).

For those completing the group process, demographic data from all participants was summarized. Table 2 provides a summary of the demographic statistics of the participants who agreed to participate in this study. Of the 54 participants, 41 were female and 13 were male. This high proportion of females in the sample (76%) is consistent with other studies that have reported female participation ranging from 63% (Carmody & Baer, 2008) to 75% (Carmody, Kristeller & Merriam, 2008) to 90% (Wachholtz & Pargament, 2008). The average age of the participants was 45.4 years (s.d. =12.6 years) with ages ranging from 18 to 72 years. The average age of the male participants was 43.4 years while the average age of the female participants was 46.0 years. In terms of employment, 23 indicated they were currently unemployed, 13 indicated they worked part-time, while 17 indicated that they were employed on a full-

time basis. One person did not provide this information. Of the 54 participants, 44 provided information related to income, with 37% of respondents having income in the \$0-\$25000 range and 28% having income in the \$75,000 and over range. Mean education level was reportedly 14.3 years and ranged from 11 to 25 years including all years of education. In terms of healthcare, participants reported experiencing chronic pain on average for 10.3 years with a range of 2.0 years to 43.0 years. Fifty-one of the participants indicated taking prescription medication for pain management. Of the 53 participants providing information related to past mental health, 38 indicated a history of depression, although it is unknown when that diagnosis occurred. This number is higher than the usual estimates of depression in individuals experiencing chronic pain, which is estimated typically at approximately 50% (Rippentrop et al., 2005). However, it should be noted that information related to the severity of depression was not requested and the sample for this study was composed of individuals referred for psychological services.

In terms of pain location, 18 people reported pain related to the head area (including headache, facial, TMJ, and jaw pain), while 11 reported neck pain, and 21 reported back pain. Nineteen reported lower body pain (including pelvic, knee, and foot pain), while eight participants reported experiencing fibromyalgia. Chronic pain experienced in multiple sites was reported by 34 out of 54 (63%) of the participants. This data is summarized in Table 3.

In terms of religious or spiritual demographic information for the overall sample, 39 out of 44 participants reported a belief in a higher power, 35 expressed affiliation with a specific religion, the most common was Christianity (32 participants). Traditional aboriginal spirituality was endorsed by one participant; Islam by another, Hindu tradition

by one participant, and 11 expressed no religious affiliation. When asked if they prayed, 43 participants provided information with 34 responding affirmatively. When asked about church attendance, 41 participants responded, 20 reporting some level of church attendance. In terms of familiarity with mindfulness meditation, 32 indicated no prior knowledge of MM, five reported being “somewhat familiar”, nine “very familiar,” and one “completely familiar” with mindfulness principles. Summaries can be found in Table 2. It is noteworthy that a number of individuals did not provide spirituality or religious information. The reason for this is unknown.

Table 2

Demographic data summary for entire sample

Age	N	Mean	S.D.	Range	T-Test (t)	Signif.
Entire sample	54	45.4	12.6	18-72		
Female	41	46.0	11.6	20-72	-0.654	n.s.
Male	13	43.4	15.7	18-72		
		Yes	No	Most common response	Mean / s.d.	
Engaged in Prayer		34	9	Daily	48 / 37.3	
Church Attendance		20	21	4 / mo	3 / 1.41	
Belief in higher power		39	5			
Meditative practice		9	10			
Yoga practice		2	17			
Prescription medications		51	3			
Previous Depression Diag.		38	9			
Use Alcohol to relieve pain		3	16			
Use exercise to relieve pain		11	8			
		Not at all	Somewhat	Very	Completely	
Familiar with Mindfulness		32	5	9	1	
		Unemployed	Part time	Full time		
Employment		23	13	17		

Table 3

Pain location summary for entire sample

Pain Location	Frequency in sample
Eye pain	1
Facial and TMJ	4
Headache	13
Neck pain	11
Back pain	21
Upper extremity(shoulder, arm, hand, fingers)	7
Hip or Pelvic Pain	4
Lower body pain (knee, feet, leg)	15
Gastrointestinal / abdominal	2
Fibromyalgia	8
Diffuse or generalized	3

Additionally, a significant number of participants returned incomplete SAS questionnaires. From the initial questionnaires, 10 individuals did not complete the SAS. From the post group questionnaires, 26 individuals did not complete the SAS. Thirteen individuals did not complete any post group evaluations. However, in an analysis of the pre group data collected from all individuals, (the MPQ and HADS) no significant differences were found in pain ratings [$F(4, 49) = 0.87, p = 0.49$] between those who completed the post group evaluations ($N=28$) and those who did not complete all

questionnaires (N=26). Additionally, no differences were found in self-reported anxiety or depression [$F(2, 49) = 0.42, p = 0.66$] between those who completed the post group evaluations (N=28) and those who did not complete all questionnaires (N=24). Furthermore, no differences were found between these two groups on initial reported spirituality [$F(4, 39) = 1.09, p = 0.37$]. No differences were found between completers and non-completers on demographic variables including age or gender. However, completers were found to have a higher level of education (completers having on average 15.5 years of education while non-completers having on average 13.5 years of education). Carmody and Baer (2008) reported an issue with dropout and incomplete participation (questionnaire completion). These authors suggested that through an analysis of pre-group measures, one could suggest that the data of the participants who completed all measures could represent the entire sample including those who did not return all questionnaires. In this study, the 28 participants that provided complete dependent variable data at both pre- and post-group samplings did not differ significantly on any of the pre-group dependent measures from those who did not complete all post-group measures. By this analysis, it would seem that these 28 participants could be seen as fairly representing the larger group who agreed to participate but did not complete all questionnaires. However, the presence of a high number of non-completers means that the results of this study are preliminary and tentative at best. If understood as exploratory, the findings of this study may be beneficial in helping guide the direction of future research. This is further commented on as a limitation of this study.

Demographic data by group

The control group was comprised of 29 participants and the mindfulness group contained 25 participants. There were 20 women in the control and 21 women in the Mindfulness group. The average age of participants in the control group was found to be 44.7 years (s.d. =13.2 years) while the average age of participants in the mindfulness group was found to be 46.2 years (s.d. =12.1 years). In terms of education, participants in the control group had a mean of 14.1 years of education (s.d. = 2.2) and participants in the mindfulness group had a mean 14.5 years of education (s.d. =3.3). Participants in the control group reported experiencing chronic pain for on average 11.0 years, while participants in the mindfulness group reported mean chronic pain durations of 9.6 years. Twenty-six out of 29 participants in the control group and all 25 of the participants in the mindfulness group reported utilizing medications as a part of their pain management. Twenty out of 22 participants in the control group and 19 out of 22 participants in the mindfulness group reported a belief in a high power. Other demographic details can be found in Tables 4 and 5. A comparison between groups can be found in Table 6. Using ANOVAs, no significant between group differences were found for any demographic variable. It is also noteworthy that the groups did not differ significantly on any of the dependent variables measures taken pre-group. This would indicate that the group participants were comparable prior to treatment.

Table 4

Control group demographic data summary

	N	Mean	s.d.	range	F	Sig.
Age	29	44.7	13.2	18-72	-0.439	n.s.
Education	23	14.1	2.2	11-19		
Pain Duration	29	11.0	6.6	3-24		
Employment	Unemployed		Part time		Full time	
	12		7		9	
Income	\$0-25000	\$25000-45000	\$45001-75000	\$75001+		
	10	3	6	5		
Mindfulness	Not familiar	Somewhat	Very	Completely		
	16	4	3	1		
Gender	Female	Male				
	20	9				
	Yes	No	Most frequent response	Mean / s.d.		
Do you pray	19	4	1 / day	30 / 32.3		
Church attend.	10	11	Of those who attend: Once a week	1.7 / 2.6		
Higher Power	20	2				
Prescr. Med	26	3				
Depression Dx	19	9				
Yoga	2	19				
Religious Affil.	Christian	Hindu	Muslim	Aboriginal	None	
	15	1	1	0	6	

Table 5

Mindfulness group demographic data summary

	N	Mean	s.d.	range	F	Sig.
Age	25	46.2	12.1	20-67	-0.439	n.s.
Education	21	14.5	3.3	11-25		
Pain Duration	25	9.6	8.3	2-43		
Employment	Unemployed		Part time		Full time	
	11		6		8	
Income	\$0-25000	\$25000-45000	\$45001-75000	\$75001+		
	6	3	4	7		
Mindfulness	Not familiar	Somewhat	Very	Completely		
	16	1	6	0		
Gender	Female	Male				
	21	4				
	Yes	No	Most frequent response	Mean / s.d.		
Do you pray	15	5	Once a day	23.1 / 31.7		
Church attend.	10	10	Of those who attend: Once a week	1.53 / 1.9		
Higher Power	19	3				
Prescr. Med	25	0				
Depression Dx	19	6				
Yoga	6	13				
Religious Affil.	Christian	Hindu	Muslim	Aboriginal	None	
	17	0	0	1	5	

Table 6

Group demographic data comparison by group

		Control			Mindfulness		
		N	Mean	s.d.	N	Mean	s.d.
Age		29	44.7	13.2	25	46.2	12.1
Education		23	14.1	2.2	21	14.5	3.3
Pain Duration		29	11.0	6.6	25	9.6	8.3
Gender	Female	20			21		
	Male	9			4		
Employment	Unemployed	12			11		
	Part time	7			6		
	Full time	9			8		
Income	\$0-\$25000	10			6		
	\$25001-\$45000	3			3		
	\$45001-\$75000	6			4		
	\$75001 & over	5			7		

*Hypothesis testing**Mindfulness training and pain ratings.*

The first hypothesis in this study stated that the pain ratings, as measured by the MPQ, of individuals in the standard care plus mindfulness group (referred to as the mindfulness group) would be lower than the pain ratings from participants in the psycho-

education only group (referred to as the control group) once the eight week group was completed. In order to test this hypothesis, a repeated measures MANOVA was used with group assignment (control or mindfulness) as the between subjects variable and the McGill Pain Questionnaire scales (Sensory, Affective, Evaluative, Miscellaneous, Present Pain Index, and Pain Rating Index) as dependent variables. There were 14 subjects in each group. No significant differences were found between the two groups on any of the Pain scales included [$F(6, 21) = 0.49, p = 0.8$]. However, it was noted that the Affective scale violated the homogeneity of variance assumption of the MANOVA test.

Performing non-parametric comparisons demonstrated that overall, a significant change from pre- to post-group in the Affective subscale was present ($z = -2.03, p < 0.05$) and that when comparing each group separately, the change was significant for the mindfulness group ($z = -2.02, p < 0.05$), but not for the control group ($z = -0.80, p = 0.43$). The mindfulness group demonstrated a significantly larger reduction in affective pain intensity than the control group. Interestingly, an examination of the quartile results indicates that the largest change appeared to occur in those reporting the highest initial Affective scores. In the control group, respondents with initial MPQ Affective scores in the 75th percentile or above experienced a mean increase in score from 8.5 to 9.0, while those in the mindfulness group experienced a reduction in MPQ Affective scores from 8.0 to 5.0. The median scores were similar for both control and mindfulness groups, initially 5.0 and post treatment 4.0. The effect sizes were considerably larger for those in the mindfulness group (effect size = 0.33) as compared to the control group (effect size = 0.13).

Although no overall statistically significant differences was found, a survey of the MPQ subscale mean scores of each group found that the McGill Sensory (S) scale and the McGill PRI scale warranted further examination. For the control group, the pre-group mean MPQ Sensory score and the post-group score indicate no change, while for the Mindfulness group there was a reduction of 1.8 points. Similarly, looking at the Pain Rating Index (PRI), for the control group, a reduction of 2.9 points was noted while a reduction of 4.5 points was found for the Mindfulness group. However, these differences in mean scores were not statistically significant. This data is summarized in Table 7.

Table 7

Group differences for select MPQ scale means.

Measure	Control group			Mindfulness group		
	Pre Mean (s.d.)	Post Mean (s.d.)	Change	Pre Mean (s.d.)	Post Mean (s.d.)	Change
MPQ (S)	24.3 (10.8)	24.3 (7.3)	0	22.9 (8.9)	21.1 (10.7)	-1.8
MPQ PRI	44.7 (19.4)	41.8 (13.8)	-2.9	42.9 (15.3)	38.4 (16.6)	-4.5

Mindfulness training and spirituality.

The second hypothesis stated that change in overall spirituality (as measured by the total score on the SAS) would be higher in the mindfulness group when compared to the control group, once group sessions were completed. A repeated measures MANOVA was conducted with group assignment as the between group variable and each of the Spirituality sub-scales (Meaning, Innerness, Interconnectedness, Transcendence, and Total score) as the dependent variables. Again, no significant difference was found

between the groups [$F(4, 23) = 0.27, p = 0.89$]. However, the change in self-reported Innerness as summarized in Table 8 was noted. Participants from the control group showed a change in self-reported Innerness of 0.33 points while participants from the mindfulness group reported an increase in self-reported Innerness of 2.31 points. While not sufficient to be statistically significant, there was a sevenfold difference in the self-reported Innerness scores between groups.

Also noteworthy was the overall time 1 to time 2 change, a trend that approached a significant difference [$F(4, 23) = 2.55, p = 0.067$]. This would appear to indicate a change in self-reported spirituality approaching significance when only considering change over time and not group membership. As this difference was not statistically significant, it is not possible to determine reliably which of the SAS subscales may have demonstrated change. However, partial eta squared was found to be 0.3, indicating a potentially important change that may have produced a significant difference had the sample size been larger.

Table 8

Mean pre and post group scores for SAS subscales by group.

SAS subscale	Group	Time	Mean	S.E.	Change
Meaning	Control	Pre group	15.1	1.02	-0.6
		Post group	14.5	1.31	
	Mindfulness	Pre group	16.4	0.89	-0.3
		Post Group	16.1	1.13	
Innerness	Control	Pre group	35.7	2.13	0.3
		Post group	36.0	1.90	
	Mindfulness	Pre group	36.6	1.84	2.3
		Post Group	38.9	1.65	
Interconnectedness	Control	Pre group	40.8	1.38	-2.3
		Post group	38.5	1.56	
	Mindfulness	Pre group	41.7	1.20	-0.9
		Post Group	40.8	1.35	
Transcendence	Control	Pre group	21.3	1.46	-0.9
		Post group	20.4	1.29	
	Mindfulness	Pre group	21.9	1.26	-0.8
		Post Group	21.1	1.12	

Spirituality and pain ratings.

The third hypothesis was related to spirituality and stated there would be a significant correlation between changes in spirituality and pain ratings. In order to test this hypothesis, change scores from time 1 to time 2 were calculated for each of the spirituality and pain scales. These change scores were then entered into a correlation matrix and findings are summarized in Table 9. Of note, a significant correlation was found between the Total SAS change score and the MPQ PRI change score, supporting the third hypothesis.

Exploratory analyses found significant correlations between the SAS Transcendence change score and the MPQ Sensory and Evaluative change scores, as well as between the SAS Interconnectedness change score and the MPQ Evaluative change score. Given the number of correlations calculated, a Bonferroni type family-wise error adjustment was necessary. As seen in Table 9, using a new alpha probability of 0.002 for statistical significance, none of the correlations were statistically significant. However, for exploratory purposes at the 0.05 level of statistical significance, a number of correlations warranted further exploration. Although caution is indicated, in that a number of correlations were conducted and therefore the risk of Type 1 error is elevated, there is reason to consider the possibility that these variables are in some way related. The issue of controlling for Type I error is discussed later.

Table 9

Pearson correlation matrix for SAS and MPQ scales change scores (n=28).

Scale	MPQ Sensory	MPQ Affective	MPQ Evaluative	MPQ Misc.	MPQ PRI	MPQ PPI
SAS Meaning	-0.21	-0.17	-0.06	-0.21	-0.24	-0.36
SAS Innerness	-0.36	-0.10	-0.35	-0.001	-0.32	-0.21
SAS Interconn.	-0.30	-0.15	-0.38*	-0.168	-0.34	-0.36
SAS Transcend	-0.38*	-0.08	-0.42*	-0.03	-0.35	-0.06
SAS Total	-0.46*	-0.22	-0.50**	-0.10	-0.46*	-0.22

MPQ Misc. = Miscellaneous; SAS Interconn. = Interconnectedness; SAS Transcend. = Transcendence;
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.002$

As can be seen from Table 9, when assessing the relationship between the MPQ Sensory change score and the SAS subscales, the SAS total change score has a higher correlation than the Transcendence subscale change score alone. This would indicate that the Total change score is capturing variance from the other subscales that may not be significant individually. The Transcendence subscale change score is the single subscale with the strongest relationship with the change in MPQ Sensory self-report. Further analyses were conducted, as the MPQ Sensory change score was also correlated with the HAD Depression change score ($r=.37$, $n=37$, $p<0.05$). Regression analyses were conducted and can be found later in the supplemental analyses section.

In order to measure the relative contribution of the SAS subscales in understanding the change in MPQ Evaluative subscale, separate multiple regression analyses were conducted in order to avoid issues related to singularity. Results are summarized in Table 10. Years of chronic pain was entered into each equation as this

had been found to be correlated with the MPQ Evaluative change score ($r = -0.40$, $p < 0.01$).

Table 10

Multiple regression values for SAS subscale and total change score predictors of MPQ Evaluative subscale change score

Measure	β	SE β	Beta	t	Sig. (p)
SAS Transcendence Δ score	-0.11	0.05	-0.41	-2.34	0.03
SAS Total Δ Score	-0.05	0.02	-0.50	-2.97	0.006

The Interconnectedness and Transcendence change scores were entered into a multiple regression analysis with patient years of reported pain. After ensuring that there were no violations of assumptions of normality, linearity, multicollinearity, and homoscedasticity, a statistically significant regression equation was noted for the Transcendence change score [$F(1, 26) = 5.48$, $p < 0.05$]. This equation accounted for 14.2% of the variance in the MPQ Evaluative subscale change score. The Interconnectedness change score was found to be a non-significant contributor to this equation as was the variable years of chronic pain once the Transcendence change score was entered into the equation. A second multiple regression was conducted with the SAS Total change score entered together with the Years of Pain demographic variable. The new equation was statistically significant [$F(1, 26) = 8.84$, $p < 0.01$] and accounted for a greater percentage of variance, 22.5%.

Spiritual Innerness and pain ratings.

The fourth hypothesis measured the role of spiritual Innerness in predicting the change in MPQ scores. Unfortunately, as can be seen from Table 9, Innerness was not significantly correlated with (and therefore did not significantly predict) any of the McGill Pain Rating scales as was predicted in the fourth hypothesis of this study.

Spirituality and mood/anxiety symptoms.

It was also predicted for this study that an increased level of self-reported spirituality would be significantly correlated with reduced self-reported depressive (Hypothesis 5) and anxiety symptoms (Hypothesis 6). Such an inverse relationship would indicate that increases in reported spirituality were correlated with reductions in self-reported depressive and anxiety symptoms. A correlation matrix with the change scores from the SAS and the HAD was created in order to test this hypothesis. It was found that the change in self-reported anxiety was significantly inversely correlated with the change in self-reported meaning as measured by the SAS ($r = -0.45$, $n = 28$, $p = 0.015$). It was found that the change in self-reported depression was significantly inversely correlated with the change in self-reported Innerness as measured by the SAS ($r = -0.44$, $n = 28$, $p = 0.02$). Finally, it was found that the change in self-reported depression was inversely correlated at a significant level with the change in the total SAS score ($r = -0.44$, $n = 28$, $p = 0.02$). It should be noted that in testing these final two hypotheses, 10 correlations (5 correlations per hypothesis) were conducted thereby increasing the probability of Type 1 error. Adjusting the alpha for multiple correlations using a similar Bonferroni type adjustment as above for multiple comparisons (f.w. alpha = 0.05, individual alpha = 0.01) reduced the probability needed for statistical significance

sufficiently to render the above correlations not significant. Therefore, caution is warranted in evaluating and interpreting the above correlations.

A comment needs to be made about the number of analyses conducted in this study and the necessity for an adjustment of alpha utilizing the Bonferonni adjustment. Some authors have noted the conservative nature of the Bonferonni adjustment and the associated elevation in risk of Type 2 error (Perneger, 1998). Therefore, while a conservative approach was utilized here, the statistically significant findings that became non-significant still warranted comment.

Finally, a comment should be made about the power of the analyses conducted above. The observed power found in the test of differences in pre- and post-group pain ratings comparing the control and mindfulness groups was found to be 0.16. The power in the test of pre- and post-group pain ratings when combining groups was found to be 0.48. For the second hypothesis, the test of changes in spirituality from pre to post group comparing control and mindfulness groups was found to be 0.13 while power for the test combining groups was found to be 0.63.

Supplemental Analyses

Additional analyses were conducted to understand the data collected in this study. Significant correlations were found between changes in the MPQ sensory subscale and changes in the SAS Transcendence subscale ($r=-0.379$, $n=28$, $p<0.05$), changes in the SAS total change score ($r=-0.46$, $n=28$, $p<0.05$), and changes in the Depression subscale of the HAD ($r=0.37$, $n=37$, $p<0.05$). That is, reductions in reported sensory experience of pain were correlated moderately with increases in reported transcendent type spirituality as well as total reported spirituality. Furthermore, reductions in reported sensory

experience of pain were correlated with reductions in reported depressive symptoms. The relationship between these variables was explored using stepwise multiple regression analysis. Because of the strong correlation between the SAS total change score and the Transcendent subscale change score ($r = 0.78$, $N=28$, $p<0.001$), separate regressions were conducted for comparative purposes. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Results are reported in Table 11.

Table 11

Regression values for SAS Transcendence and Total change score as predictors of MPQ Sensory change score

Measure	β	SE β	Beta	t	Sig. (p)
SAS Transcendence Δ score	-0.50	0.24	-0.38	-2.09	0.046
SAS Total Δ Score	-0.26	0.10	-0.46	-2.65	0.014

In the first regression analysis, changes in HAD depression subscale score and in SAS transcendent subscale scores were entered. The resulting regression equation accounted for 11.1% of variance [$F(1, 26) = 4.37$, $p<0.05$] when only the SAS Transcendence difference score was entered. The HAD depression subscale change score was not a significant predictor of the MPQ sensory change score. In the second regression analysis, changes in HAD depression subscale score and changes in SAS Total subscale scores were entered. The resulting equation accounted for 18.2% of variance

when only the Total SAS change score was entered [$F(1, 26) = 7.00, p < 0.05$]. Again, the HAD depression subscale score was not found to significantly predict MPQ Sensory change scores.

Significant correlations were found between HAD depression change and the MPQ Sensory change score (already noted), the change score in reported SAS Innerness ($r = -0.44, n = 28, p = 0.02$), and change in the overall SAS total score ($r = -0.44, n = 28, p = 0.02$). Again, separate multiple regression analyses were conducted due to the high correlation between the change scores of the Innerness subscale and Total score of the SAS ($r = 0.84, n = 28, p < 0.001$). Gender was also entered into the equation as this variable had been found to correlate significantly with the HAD depression change score. Again, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Gender was entered, as were the Sensory subscale change scores and the change in Innerness subscale scores. Results are reported in Table 12.

Table 12

Multiple regression values for SAS Innerness and Total change score predictors of HAD depression change scores

Measure	β	SE β	Beta	t	Sig. (p)
SAS Innerness Δ score	-0.28	0.11	-0.44	-2.51	0.019
SAS Total Δ Score	-0.12	0.05	-0.44	-2.52	0.018

The resulting equation explained 16.4% of the variance in depression change scores. A statistically significant equation was found when the Innerness change score was entered [$F(1, 26) = 6.31, p < 0.05$] indicating that an increase in reported spiritual innerness was predictive of a reduction in reported depressive symptoms. Once the Innerness change score was entered into the equation, gender and changes in MPQ Sensory subscale scores were not significant predictors of changes in reported depressive symptoms. Similar multiple regression analyses were conducted substituting the change in Total SAS score for the change in Innerness subscale score. Gender was once again entered into the equation. The inclusion of the SAS Total change score variable did yield a statistically significant equation [$F(1, 26) = 6.32, p < 0.05$] accounting for 16.4% of the variance in the change in depression scores variable.

In examining the impact of mindfulness training on reported symptoms of depression, no statistically significant results were found [$F(1, 34) = 0.02, p = 0.89$]. While no significant difference between groups was found for anxiety, [$F(1, 34) = 1.50, p = 0.23$], Table 13 illustrates the differences found that point to a potentially beneficial impact of mindfulness training in alleviating anxiety symptoms. As can be seen, a substantial difference was observed in self-reported anxiety symptoms and, while not statistically significant, these reductions in ratings would place control participants in the borderline moderate range after treatment while the mindfulness participants would be classified as mildly anxious on average. This difference may be of clinical importance.

Table 13

Self reported anxiety scores (HADS Anxiety) measured pre and post group (n = 36)

	Pre-group	Post-group	Difference
Control	11.28	10.56	-0.72
Mindfulness	10.94	8.78	-2.16

Discussion

This study set out to measure the relationship between spirituality and chronic pain. Utilizing mindfulness as an intervention previously shown to be effective in the management of chronic pain and with roots in spiritual traditions, this study also attempted to measure the relationship between self-reported spirituality and the development of a mindfulness practice. It was thought that Innerness, defined as a feeling of wholeness, calm, serenity, empowerment, and peace, would be measurably enhanced through the teaching of mindfulness. Such a finding would have implications for some of the hypothesized underlying mechanisms for mindfulness. Individuals provided with the mindfulness group experience were expected to demonstrate a greater increase in spirituality than those who received the standardized psycho-education training. In using an active control group, this study addressed one of the shortcomings of previous research measuring the relationship between spirituality and mindfulness. Additionally, in utilizing a measure of spirituality with a broader set of questions, this study increased the likelihood of capturing aspects of spirituality previously unmeasured. Finally, this study focused on the chronic pain population, addressing the shortage of

research exploring the relationship between non-religious aspects of spirituality and the management of chronic pain.

Relationship between mindfulness and pain management

As can be seen from the results, this study was unable to demonstrate a significant difference in overall self-reported pain ratings, as measured by the MPQ, between individuals receiving the standardized psychoeducation group intervention and those receiving additional mindfulness training. However, in assessing the Affective scale of the MPQ, a significant difference was found. Participants in the mindfulness group were found to report a significantly greater reduction in affective aspects of pain ratings when compared to participants in the control group. The Affective scale measures reports of pain in terms of tension, fear, and autonomic arousal. Indeed, when comparing participants from the two groups with the highest Affective pain ratings, participants from the mindfulness group showed substantial reductions in pain scores while participants in the control group showed no statistical change. This effect was found to be moderate in size. Those participants reporting the highest Affective pain ratings appeared to benefit the most from mindfulness training. While other non-statistically significant between group differences were described (differences in Sensory pain ratings and PRI ratings), these may only be useful in helping guide possible future research. The differences in Affective pain ratings are consistent with previous studies that have demonstrated the usefulness of mindfulness in the management of chronic pain (Kabat-Zinn, 1982; Baer, 2003). This study suggests that this difference could be additive to the benefits derived from an active intervention control group thereby suggesting a role for mindfulness training in addition to other active psychoeducational interventions. This

finding also reaffirms the important role of non-pharmacological strategies in the management of chronic pain.

The reason for the lack of significant findings in other pain rating areas measured in this study remains an open question. Previous research by Kabat-Zinn (1985; 1987) and as summarized by Baer (2003) has found significant reductions in pain ratings in individuals who have been trained in mindfulness. However, recent research incorporating meditative practice emphasized the role of pain tolerance in pain management (Wachholtz & Pargament, 2008). This current study did not include a measure of pain tolerance and was therefore unable to capture any such change. However, affective aspects of pain can be linked theoretically with pain tolerance in that pain tolerance has been associated with lower scores in the areas of fear, nervousness, upset, and irritability (Wachholtz & Pargament). These terms fit closely with the types of terms used in the Affective scale of the MPQ that describes pain in terms of tension, fear, and autonomic arousal. While the role of pain tolerance can only be suggested in this study, future research may choose to utilize such measures to better understand this relationship.

It might also be noted from the demographic summary that a significant number of individuals reported being familiar with mindfulness prior to entering the group intervention. This may have affected the findings by limiting the amount of change over the 8-week group period and minimizing the differentiation between control and mindfulness group results. Individuals reporting some familiarity with mindfulness were in both types of groups. The impact of individuals familiar with mindfulness in the mindfulness group may have resulted in a reduction of change measured due to previous

familiarity with mindfulness. Alternatively, the impact may also have been minimized as they may have been better able to apply mindfulness strategies due to their pre-existing knowledge. Individuals familiar with mindfulness in the control group may have utilized mindfulness strategies as their understanding of pain management grew (even though mindfulness was not mentioned or discussed in these groups) thereby increasing the benefit gained from the group and narrowing the between group differences. However, the demographic questionnaire did not differentiate between familiarity and active application or use of mindfulness strategies within the context of chronic pain management, something future research may need to distinguish. Without this distinction, it is difficult to know if any of these participants were familiar with applying mindfulness within the context of chronic pain. It must be noted however that this prior mindfulness knowledge may have influenced the lack of statistically significant findings in this study.

Relationship between mindfulness and spirituality

This study was unsuccessful in demonstrating the hypothesized difference in self-reported spirituality between individuals participating in the two types of groups. The differential change in reported spiritual Innerness between the two groups was also not supported. While this was unexpected, recent research by Carmody et al. (2008) found that spiritual well-being (defined as feelings of inner meaning and peace) were enhanced through the practice of mindfulness. It is notable that the definition of spirituality used in the Carmody study may have blended meaning and peace into one concept (measured separately in this study), making distinctions difficult. Future research may be able to establish a statistically significant difference in reported

Innerness, perhaps utilizing a larger sample, thereby supporting the proposition that Innerness specifically is impacted differentially by mindfulness training. If established, this could be applied to the role of mindfulness as a tool in the development of aspects of spirituality associated with peace, serenity, and empowerment. Such a finding could be used to support theories proposing enhanced spiritual Innerness (involving acceptance, non-judgment, and peace) as mechanisms for mindfulness.

Spirituality and Pain management

This study did not find the hypothesized statistically significant relationship between spiritual Innerness and reported pain. However, other aspects of measured spirituality, as well as overall spirituality, were associated with pain ratings. Specifically, this study found a negative correlation between changes in overall spirituality and changes in sensory aspects of reported pain. This inverse relationship indicated that increases in overall spirituality were associated with reductions in reported total pain. This finding is supported by other significant correlations found in this study. Specifically, regression analyses found that overall spirituality was found to account for 18.2% of the variance in changes on reported Sensory aspects of pain. Transcendence alone was found to account for 11.1% of the variance of changes in Sensory scores and this was a more important predictor of sensory scores than changes in reported depressive symptoms. These findings constituted small but potentially important effects and may be understood to have two possible implications. First, while transcendent spirituality was the single most significant predictor of changes in reported sensory aspects of chronic pain, overall spirituality was a more powerful predictor. This likely indicates that other aspects of spirituality measured in this study accounted in small ways for the variance in

pain ratings. Second, transcendent spirituality may play a more prominent role in this sample than the frequently reported relationship between depression and pain (Eimer & Freeman, 1998). If this finding was replicated, this possibility would increase the importance of spirituality in the management of chronic pain and could have important implications for treatment. This proposition would be important to expand upon in future research.

An inverse correlation was found between spiritual Interconnectedness and Evaluative aspects of reported pain ratings. Higher levels of spiritual Interconnectedness were associated with lower levels of subjectively reported Evaluative pain ratings. An inverse correlation was also found between spiritual Transcendence and Evaluative aspects of reported pain ratings. Increases in reported spiritual Transcendence were correlated with reductions in McGill Evaluative pain ratings. Regression analyses found that transcendent aspects of spirituality accounted for 14.2% of variance and was a better predictor of changes in Evaluative aspects of pain than reported symptoms of depression or spiritual Interconnectedness. Overall spirituality was found to account for 22.5% of the variance in changes in Evaluative aspects of reported pain. This could represent a combination of the contribution of the two significant correlates of changes in evaluative aspects of pain, namely spiritual Transcendence and Interconnectedness. This moderately sized effect would seem to indicate that different aspects of spirituality may impact the pain experience in more than a purely sensory way, an important consideration given the multidimensional view of pain, and that multiple aspects of spirituality may be useful in managing various dimensions of pain. This also emphasizes the need to measure multiple aspects of spirituality when studying pain management.

As can be seen from the above discussion, Transcendent aspects of spirituality were found to play a significant role in accounting for changes in a variety of pain ratings. While these findings were correlational and difficult to interpret from a causal perspective, available literature does raise some interesting implications for these findings.

As noted earlier, Wachholtz and Pargament (2008) have found that spiritually based meditation resulted in a higher level of pain tolerance. The Transcendent spirituality subscale used in this study measured a person's sense of going beyond the limits of usual experience and rising above the present bodily condition. Transcendence may represent one way of going beyond intense pain, experiencing greater tolerance and lower pain intensity. The current study raises the possibility that Transcendent spirituality may represent one of the mechanisms by which individuals experiencing chronic pain find relief. This is also consistent with the theorized mechanisms of Spirituality as described by Wachholtz, Pearce, and Koenig (2007). However, because specific spiritual/religious texts were not utilized in this study, the mechanism may not be limited to religious texts as suggested by these authors. Future research may confirm and elaborate on this conclusion.

Spirituality and psychological symptoms

This study found an inverse relationship between Innerness and reported symptoms of depression. Increases in reported Innerness were associated with reductions in reported symptoms of depression. Again, because this finding was correlational, no causative direction could be concluded. However, Innerness was found to account for 16.4% of the variance in reported changes in depressive symptoms. Further, this same

amount of variance was accounted for when utilizing the Total SAS score representing overall measured spirituality. This would indicate that of the four aspects of spirituality measured in this study, no other facets of spirituality accounted for any additional variance. This finding is important for two reasons. First, it supports the view that spirituality may be a potentially important way of reducing suffering due to depression within the context of chronic pain. This brings specific application of previous studies reporting the benefit of spirituality in the relief of mood symptoms (Williams et al., 2007) to the management of chronic pain and suggests that Innerness may be important in the way in which Spirituality can be helpful. This hypothesis needs further study and elaboration given the correlational nature of the relationship in this study.

Second, given the frequently reported link between depression and chronic pain (Eimer & Freeman, 1998) and as supported by findings in this study (where a negative correlation was found between self-reported depression scores and Sensory aspects of reported pain), there is evidence for a possible indirect effect of Spirituality on pain ratings. By influencing the experience of depression, Spirituality might have an indirect impact upon Sensory pain ratings. This indirect influence seems to be in addition to the direct relationship between spiritual Transcendence and pain ratings discussed earlier. The findings of this study are consistent with previous research and it might be possible that had data been collected over a longer period, one might have found stronger evidence for this indirect effect. It should be noted however that a significant number of individuals reported a previous history of depression. While it is unknown what severity or when this diagnosis may have been given, it is possible that a reduction in symptoms

may have occurred over time with no intervention. This possibility is addressed as a limitation of this study.

An inverse correlation was also found between spiritual meaning and self-reported symptoms of anxiety. Increases in self-reported meaning were correlated with reductions in reported anxiety symptoms. One interpretation of this finding is that a sense of meaning, purpose, and hope may have contributed to the alleviation of symptoms of anxiety. Alternatively, the reduction of anxiety may have provided participants with a sense of hope and worth. The former explanation would appear to support the theory of Wachholtz, Pearce, and Koenig (2007) who suggested that a sense of broader meaning and purpose, as a context for the pain experience, would allow for greater coping with pain. The above explanation would imply that spiritual meaning could affect the pain experience via reduced anxiety, an acknowledged part of the pain experience (Rockers & Fishman, 2002). This implication requires further investigation and research to understand better the correlational nature of the relationship in this study.

Mindfulness and psychological symptoms

This study did not find a significant difference between participants in the mindfulness group versus control group in self-reported pre-post-treatment depressive symptoms. While the difference in self-reported anxiety was also not statistically significant, descriptively there appeared to be a greater reduction in reported symptoms from those in the mindfulness group when compared to the control group. Mindfulness training may have facilitated a reduction in participant mean scores from moderate anxiety to mild anxiety, a possibility that may have important clinical utility but would need further investigation and replication given that it was not a statistically significant

finding of this study and therefore may have been found by chance. Previous studies have demonstrated the utility of mindfulness in reducing symptoms of anxiety (Kabat-Zinn et. al, 1992). This study did find a statistically significant effect for mindfulness training on Affective pain ratings. Mindfulness training produced a greater reduction in affective pain ratings when compared to the control group. The descriptions used in the McGill Affective pain rating scale, including tension, fear, and autonomic arousal are all aspects associated with anxiety. However, since reduced anxiety symptoms was not a statistically significant finding of this study, one can only rely upon past research to justify the use of mindfulness in reducing anxiety. Future research will need to establish the statistical significance of the impact of mindfulness training upon anxiety, over and above a standard psychoeducational intervention.

The difference between a statistically significant finding and a finding of clinical importance bears some discussion. The statistically significant finding indicates a result that cannot be attributed to chance. Statistically significant findings are important because they assist consumers of research in distinguishing chance findings from those that have a high probability of existing in the population used to derive the sample. However, with larger sample sizes, smaller differences between groups being studied become statistically significant even though the actual difference found may have limited clinical significance. As such, statistically significant differences do not necessarily equate with clinically significant differences. In this study, there appeared to be a reduction in reported anxiety associated with participants in the mindfulness group compared to the control group. This finding was not statistically significant and therefore may have been a chance observation. Future research would need to find a statistically

significant difference in order to establish it as a reliable finding in this population. However, the observed differences in scores from this sample make this differential change important to attempt to replicate.

The role of Mindfulness

It was hoped that this study might elucidate the relationship between spirituality and mindfulness. Unfortunately, no significant differences due to mindfulness training were found in reported levels of spirituality. While this does not rule out the possibility of a link, it does illustrate the difficult nature of research in this area. Some authors have suggested that mindful awareness may be a useful aspect of mindfulness that may increase function and reduce suffering (McCracken et al., 2007). The theoretical link between mindful awareness, acceptance and spiritual innerness continues to make theoretical sense, despite the lack of evidence in this study. Mindful awareness and acceptance of chronic pain would entail an open, neutral, and non-reactive response to the pain experience. Spiritual Innerness was defined in this study as a sense of calm, serenity, peace, and empowerment. These definitions would appear to theoretically complement each other and continue to present a theoretically viable link between mindfulness and spirituality, with Innerness as a possible mechanism for mindfulness. While there are measures to capture spiritual Innerness, mindful awareness and acceptance has been more difficult to measure. Mindful awareness and acceptance were not measured directly in this study, a significant limitation and possible contributor to the lack of significant findings in this area of the study.

An important piece of information that would help to understand the mechanism by which mindfulness enhances chronic pain management is the ability to measure

mindful awareness. While there are instruments designed to measure this construct, many authors have questioned the utility of currently available measures. In discussing scales of mindful awareness, Carmody, Reed, Kristeller, and Merriam (2008) noted, “scales used to assess mindfulness must be regarded as experimental at their present stage of development” (p. 401). As such, these scales may not be ready to use within clinical settings and likely reflects the difficulty with defining and measuring mindful awareness.

The role of Spirituality

The preceding discussion has brought to light several aspects of spirituality that were measured and found to relate to aspects of the chronic pain experience as well as associated depression. It was noted that specific aspects of measured spirituality were found to be associated with specific aspects of the pain experience. Examples included the relationship between Transcendence with Sensory and Evaluative aspects of pain, and the relationship between Innerness and depressive symptoms. While these results need confirmation, replication, and elaboration, one might consider the possibility that the mechanism for spirituality might be dependent upon the aspect of the pain experience being measured. That is, different aspects of spirituality may affect different features of the pain experience and pain management. Spirituality may also exert both direct and indirect influences on the experience of chronic pain. This possibility emphasizes the importance of measuring various aspects of spirituality in future research.

This study also emphasizes the importance of separating spirituality and religion (Unruh, 2007). While the issue was not a formal part of the study, several participants self-identified as spiritual and not religious further emphasizing the need for ‘secular’ spiritual assessment tools.

This study found supporting evidence for a relationship between increased spirituality and reduced pain and depression symptoms. Previous research has been somewhat conflicted (Kohls & Wallach, 2007) and this may be in part due to the mixing of definitions and the lack of distinction in what participants were being asked to report. As previous authors have noted, the definition of spirituality and the distinction between religion and spirituality may prove to be important if the field is to understand fully the available literature.

In terms of mechanisms for better understanding the role of spirituality some promising avenues for future research were illuminated in this study. This study was able to show that spiritual Innerness correlated with lower levels of reported depressive symptoms. Potentially important aspects of Innerness as defined for this study included feelings of empowerment and peace, and a sense of inner strength. Future research may choose to elaborate on these aspects of spirituality and explore their role in managing depressive symptoms. Spiritual Transcendence was linked with various aspects of reported pain ratings and again may prove to be a useful research area to better understand the role of spirituality in chronic pain management.

Limitations

A number of limitations of this study need to be acknowledged. These include limitations due to sample size and limited questionnaire completion and the correlational nature of some of the findings of this study. Other limitations include the risks and benefits of Bonferonni adjustments with implications for the perceived importance of the results, the choice of measures used in this study, the lack of a “no treatment” or wait list

control group, the representativeness of the sample, and the information collected in the demographic questionnaire.

Sample size

The author of this study sought the participation of 54 individuals experiencing chronic pain and seeking assistance at a multidisciplinary pain clinic. As reported above however, although 54 participants agreed to participate in this study, only 28 provided post-group data on spirituality, one of the main variables of this study. It was found that those who provided post-group data did not differ significantly on any pre-group dependent measures from those who did provide post group data, indicating a strong likelihood that the individuals completing all questionnaires could be seen to fairly represent the entire group of participants. Despite this, the question of why such a large number of people did not return spirituality data remains open. It was noteworthy that of the 26 participants who did not provide post-group spirituality data, 16 provided no post-group data at all. The remaining 10 individuals provided only data related to pain ratings and mood. Ideally, 54 participants with full pre- and post-data would have been recruited. However, this would have extended the data collection process beyond the time available to complete the study. In addition to this, as was pointed out during the informed consent process, each participant was free to not participate. The 10 individuals who submitted partial post-group data may have been exercising their right not to complete questions they deemed irrelevant or distressing. While emphasis was placed on completing all questionnaires, such a requirement would have been unenforceable for obvious reasons.

Other reasons can be offered in understanding why so many participants provided incomplete spirituality data. First, it is possible that the parameters and questionnaires associated with the study were not understood fully by all participants. While handouts and explanations were provided to all, including approved consent forms explaining the study, there remains the possibility that some may not have fully appreciated the goals of the study. Secondly, it is possible that due to the lack of information related to spirituality currently available within the medical system, the relevance of such questions to clinical care might not have been apparent. This is reflected in a comment provided by one participant who asked in regards to spirituality, "What does that have to do with my treatment?" While efforts were made to inform the participants of the aims of the study, information was limited in order to reduce the likelihood of biasing their responses.

The power of this study was none the less compromised with the lower completion rate. Carmody and Baer (2009) reviewed several studies involving mindfulness training and estimated effect sizes to range from 0.6 to 0.8. Utilizing an effect size of 0.7, and power of 0.8, the sample size required utilizing two tailed test with alpha of 0.05 was calculated to be 58. The initial sample size would have therefore have allowed for a reasonable opportunity to find significant differences that might be expected based on the literature. Nonetheless, with smaller numbers of individuals completing all questionnaires, the power of the study was diminished significantly and may explain the lack of significant findings. Overall, it also raises the possibility that very real relationships may not have been found to be statistically significant. The limited sample size probably reduced the likelihood of finding smaller effects that resulted from the mindfulness intervention. While the emphasis of convergent data can

help point out relationships that may be very real despite the lack of statistically significant results, this cannot replace the security of significant findings. Additionally, the limited sample size and the difficulty with incomplete questionnaires increase the tentativeness of the results. Efforts to increase the completion rate or to extend the data collection period would need to be made to avoid such assumptions.

Despite the small sample size and the limited number of statistically significant findings in this study, it is important to recognize potentially relevant and possibly important clinically findings where statistical significance may not have been found. An example from this study is the trend toward reduced anxiety between mindfulness participants and control group participants. As already noted, mindfulness participants in this study were found to report a mean anxiety score of 8.78 post-group from a mean pre-group score of 10.94. In this case, the difference was not found to be statistically significant. However, the Hospital Anxiety and Depression scale sets cutoff scores of below seven as normal, eight to 10 as mild, and 11 to 14 as moderate (Roemer, 2001). As can be seen, the mindfulness group showed a mean score initially in the moderate range (with rounding) that moved to within two points of normal. Such a finding could have potentially significant impact on the functioning of the individual even though the result was not found to be statistical significant. It is important to reiterate however that this finding was not found to be statistically significant and therefore may have been due to chance. Another group of individuals as a part of a similar treatment may not find a similar change in reported anxiety. However, this change was noted with this sample of individuals raising the possibility that perhaps this clinically important finding (for this

group of individuals) may be important to explore. As pointed out previously, perhaps there is a balance between clinical significance and statistically significant results.

Limitations of correlations

The results section acknowledged that correlations were conducted in order to better understand the relationships between variables. While correlations can help us better understand how different variables may be related, the question of causality cannot be answered by this method alone. In some cases, the differences between groups that were found over the course of time help researchers understand the possible cause and effect of independent variables on dependent variables. However, larger samples that allow for structural modeling provide for a clearer understanding of the causal relationships between variables. In this case, the impact of mindfulness instruction can be illustrated because of the inclusion of pre- and post-measures, as well as the inclusion of a non-mindfulness control group. A larger sample that would allow for more detailed statistical analysis would help confirm the causal nature of the relationships only suggested in this study.

Bonferroni adjustments

As was noted in the results section, a number of correlations were conducted thereby necessitating an adjustment in the alpha level considered for statistical significance but this adjustment was not without cost. The adjustment has been seen by some to represent a conservative attempt to reduce the likelihood of falsely identifying relationships that actually do not exist at the expense of missing relationships that do exist (Perneger, 1998). While the results section noted this adjustment and the

consequent statistical change in significance of some of the findings of this study, the discussion considered the potential importance of these relationships since the lack of a statistically significant change may not necessarily remove the possibility of a potentially clinically important or relevant finding. However, the correlational results found in this study need to be considered tentative and the differences remarked upon that did not reach the threshold of statistical difference should be considered even more cautiously. These caveats emphasize the importance of future research clarifying the relationships that exist and the importance of establishing them with statistical significance.

Measures chosen

It was noted in the literature review that defining spirituality continues to be a difficult process and that a number of measures have been developed quantifying different aspects of spirituality. The measure chosen for this study was selected for its psychometric properties, non-religious language, and ability to measure four important aspects of spiritual experience. However, other measures developed recently have been utilized to capture a broader, self-defined, spirituality that may better represent the individual spiritual experience. Future research may find benefit in utilizing more than one measure of spirituality, one allowing for a broader representation of spiritual experiences, the other allowing for a finer examination of aspects of spirituality that may prove relatively important.

In addition, this study utilized the HADS to measure anxious and depressive symptoms. This measure while being well known in the literature may not have the strongest psychometric properties when compared to other well established measures. Cost, availability, and other factors were considered in choosing this measure. However,

future research may benefit from the use of measures with stronger psychometric properties.

Lack of a “no treatment” or wait-list control group

This study chose to use as a control group, an active psychoeducational intervention group. While this type of control group can be very useful for understanding the additive effects of a particular facet of treatment, it does not allow one to measure the natural change in symptoms that can occur over time. This study could not measure the influence of time with no active treatment on the improvement (or worsening) of pain or mood related symptoms. It is possible that some reductions in symptoms could be attributed to the passage of time. Future research may benefit from a “wait list” control group for capturing this missing data.

Representativeness of the sample

The participants in this study were recruited through a chronic pain clinic after diagnosis with this condition. However, the participants were also seeking psychological services. With the limited availability of psychological services, this population can be considered a subset of the broader population seeking medical assistance at a pain clinic, which can in turn be considered a subset of those experiencing chronic pain in the community who are not referred to a pain clinic. These distinctions all add to the importance of replicating the results of this study with participants from broader populations in order to establish these findings within as representative a sample of individuals experiencing chronic pain. Without such replication, it is difficult to generalize beyond a sample of individuals seeking specialized medical and psychological assistance for their chronic pain. This study imposed few exclusion criteria in the

selection of participants which aids in the generalizability of the results. However, if these results were shown to be generalizable, the utility of mindfulness training and an emphasis of spirituality where appropriate could become a valuable tool in the management of chronic pain.

Demographic questionnaire

While designed to capture relevant information in as brief and least intrusive manner possible, some of the questions in the demographic questionnaire were ambiguous and difficult to interpret. One such question related to previous diagnoses of depression. It would have been useful to know how long ago this diagnosis was provided, whether the diagnosis was associated with chronic pain, how severe was the depression, and whether symptoms had remitted. These questions would have allowed the author to understand better the mental health history of the sample. Future research collecting this data would need to accommodate for the sometimes vague recounting of patient history, the lack of information provided to patients by health care providers diagnosing mental health conditions (often patients are told they have depression, not the severity), and the lack of information related to when their symptoms have remitted. This information would be useful in better interpreting the mental health history of study participants. Another question related to any previous experience with mindfulness. Further questions related to past practice of mindfulness, application to chronic pain management, and better clarification of what was meant by 'very' or 'completely' familiar would be useful as different people might understand these terms differently.

Future Research

Various aspects of this study raised questions relevant for future research. First, the findings of this study require replication and elaboration. The importance of sufficient sample size, participant response consistency, and sample representativeness requires additional attention and planning.

As noted in earlier sections of this study, the subject of pain tolerance has become increasingly interesting in the study of the relationship between spirituality and pain management. Wachholtz and Pargament (2008) noted that pain tolerance could be impacted by spiritual/religious meditative practice. Research generalizing this finding to non-religious versions of meditative practice and to mindfulness specifically, as well as generalizing this finding to other types of chronic pain, would enhance knowledge of how this important concept may help to provide an understanding of the role of mindfulness in managing chronic pain. Additionally, research specifically addressing the role of spiritual Transcendence in pain tolerance would further build an understanding of some of the questions raised by this research study and enhance the understanding of the relationship between spirituality and pain management.

Future research might also examine the role of mindfulness in the development of spiritual Innerness. The inclusion of measures of spiritual Innerness and of mindful awareness and acceptance would also allow researchers to measure the level of change in these areas and perhaps identify any link that may exist.

In addressing pain ratings, the role of Transcendence in understanding how pain management may be enhanced would be extremely useful. This study found spiritual Transcendence to be an important predictor of Sensory and Experiential pain ratings.

Understanding the directionality of this relationship as well as the possible role of Transcendence and Spirituality in pain management would significantly enhance the current understanding of skills and tools that have yet not been fully maximized in treatment. Similarly, an understanding of the relationship between Meaning and anxiety symptoms, as noted in this study, would elaborate upon the potential usefulness of spirituality in the management of anxiety and depression, thereby indirectly affecting pain management.

Lastly, research exploring the role of awareness as well as ways of measuring this construct would assist in understanding how this important concept interacts with the process of pain management and may be an important adjunct to traditional psychological interventions for chronic pain management. Reliable and valid measurement tools would assist clinicians helping individuals experiencing chronic pain to better develop this skill and utilize it more effectively.

Implications of this study

This study found only modest evidence for the relationship between spirituality and reported pain and symptoms of depression. Additionally, only Affective aspects of pain were found to reduce because of mindfulness training. This is inconsistent with other studies that have reported significant changes in reported pain and psychological symptoms (Baer, 2003; Ma & Teasdale, 2004). Other studies however have not combined psychoeducation with mindfulness training, and other studies have not utilized an active intervention control group. As such, the modest findings of this study would appear to indicate that mindfulness training could have an additive impact in the

management of chronic pain. The limited sample size and difficulties with questionnaire completion serve as a reminder of the difficulty of research in this area, but also speak to the importance of the findings of this study that they were attained despite the limited data available.

As noted earlier, the practice of mindfulness meditation within a Western clinical context has largely ignored or severed the connection of the practice from the spiritual roots from whence the practice emerged. While mindfulness meditation practitioners have experienced significant benefits from the adoption of this practice without explicit adoption of a spiritual orientation, the explanatory power of how the affects are gained can be enhanced if one considers spiritual gains made through the practice. This study, while not providing conclusive evidence for the link between spirituality and mindfulness, has provided evidence for a correlational link that warrants further examination. Additionally, a summary of the available literature supporting a link between spirituality and mindfulness practice has been provided.

This research has contributed to the body of literature that speaks to the impact of spirituality on health and illness. In this respect, this study has contributed to the building evidence regarding the utility of spirituality in coping with long term disorders including pain. This research also provided evidence for the importance of incorporating spirituality within a broad and holistic perspective of chronic pain and chronic disease management. Evidence such as found in this study, whether statistically significant or only suggestive, adds to the evidence that can be presented to healthcare providers in building a comfort level with complementary interventions that address the whole person and the variety of needs people report. Furthermore, this study also noted important

distinctions in the field of spiritual and religious research that could help in building consensus and understanding with the presently available research, as well as important distinctions to be maintained in future research that would increase the likelihood of finding consistent results.

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Appendix A

Demographic questionnaire

Please complete the following questions: (circle response where appropriate)

Code #: _____ Age: _____ Gender: M F

Years of Education completed: _____ years (count grade 12 as 12 years for example)

Employment: Unemployed Part-time Full-time

Please indicate which of these pain symptoms, if any, have experienced in the past week:

Please circle all that apply.

Headache

Neck pain

Back pain

Muscle pain

Joint pain

Stomach (Gastrointestinal pain)

Other _____

How long have you had this pain? _____ weeks or _____ months or _____ years.

Do you take prescription medication for your pain? No Yes

Have you ever been diagnosed with depression? No Yes

Have you ever used alcohol to help relieve pain? No Yes

Have you ever used exercise to relieve pain? No Yes

Do you pray? No Yes (if yes) how frequently _____ times per month.

Do you attend church? No Yes (if yes) how frequently _____ times per month.

Do you believe in a higher power? No Yes

Do you engage in any forms of meditation? No Yes (if yes please list)

Do you practice yoga? No Yes (if yes how frequently) _____ time per week.

How familiar are you with mindfulness meditation?

Not at all Somewhat Very Completely familiar.

Religion: Christian Muslim Buddhist Hindu Sikh

Jewish Atheist Traditional Aboriginal Spirituality

None Other (please specify)

Income: \$0-\$25000 \$25001-\$45000 \$45001-\$75000 \$75000+

Appendix B

SAS

See Howden, J.W. (1992). Development and psychometric properties of the Spiritual Assessment Scale. Doctoral dissertation, Texas Woman's University, Texas.

Appendix D

Hospital Anxiety Depression Scale (HADS)

This questionnaire is designed to help us to know how you feel. Read each item in place a firm tick in the box opposite the reply which comes closest to how you have been feeling in the past week. Don't take too long over your replies: your immediate reaction to each item will probably be more accurate than a long thought-out response.

Tick one box in each section

I feel tense or "wound up"

Most of the time	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A lot of the time	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Occasionally	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Not at all	<input type="checkbox"/>	<input checked="" type="checkbox"/>

I feel as if I am slowed down

Nearly all the time	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Very often	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sometimes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Not at all	<input checked="" type="checkbox"/>	<input type="checkbox"/>

I still enjoy the things I used to enjoy

Definitely as much	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Not quite as much	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Only a little	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hardly at all	<input checked="" type="checkbox"/>	<input type="checkbox"/>

I get a sort of frightened feeling like "butterflies" in the stomach

Not at all	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Occasionally	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Quite often	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Very often	<input type="checkbox"/>	<input checked="" type="checkbox"/>

I get a sort of frightened feeling as if something awful is about to happen

Very definitely, quite badly	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Yes but not too badly	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A little but it doesn't worry me	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Not at all	<input type="checkbox"/>	<input checked="" type="checkbox"/>

I have lost interest in my appearance

Definitely	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I don't take so much care as I should	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I may not take quite as much care	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I take as much care as ever	<input checked="" type="checkbox"/>	<input type="checkbox"/>

I can laugh and see the funny side of things

As much as I always could	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Not quite so much now	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Definitely not so much now	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Not at all	<input checked="" type="checkbox"/>	<input type="checkbox"/>

I feel restless as if I have to be on the move

Very much indeed	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Quite a lot	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Not very much	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Not at all	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Worrying thoughts go through my mind

A great deal of the time	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A lot of the time	<input type="checkbox"/>	<input checked="" type="checkbox"/>
From time to time but not too often	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Only occasionally	<input type="checkbox"/>	<input checked="" type="checkbox"/>

I look forward with enjoyment to things

As much as I ever did	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Rather less than I used to	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Definitely less than I used to	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hardly at all	<input checked="" type="checkbox"/>	<input type="checkbox"/>

I feel cheerful

Not at all	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Not often	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sometimes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Most of the time	<input checked="" type="checkbox"/>	<input type="checkbox"/>

I get sudden feelings of panic

Very often indeed	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Quite often	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Not very often	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Not at all	<input type="checkbox"/>	<input checked="" type="checkbox"/>

I can sit at ease and feel relaxed

Definitely	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Usually	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Not often	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Not at all	<input type="checkbox"/>	<input checked="" type="checkbox"/>

I can enjoy a good book / radio / TV

Often	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sometimes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Not often	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Very seldom	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Appendix E

Summary of Mindfulness group sessions

The following summary is adapted from Full catastrophe living by Kabat-Zinn as well as A systemic treatment program of mindfulness meditation for fibromyalgia patients and their partners (Moriconi, 2003). The cognitive-behavioral aspects of the group sessions are developed from the chronic pain program of the Royal National Hospital for Rheumatic Diseases, Bath, England.

Session 1

Review of guidelines for participation and consent specifics (i.e. Voluntary participation)

Introduction of instructor with brief biography and brief intro for each participant.

Review group norms and rules. Discussion of Pain Gate theory, Acute vs. Chronic pain distinctions, use of medications and issues related to addiction, role of stress management in pain management. Introduce bio-psycho-social model. Discuss distinctions between addiction and physical dependence.

Introduction to mindfulness and the 7 basic attitudes outlined by Kabat-Zinn (1990) including Acceptance, Beginner's mind, Patience, Non-judging, Non-striving, Trust, and Letting go.

Raisin eating exercise – mindful eating as an introduction to concept of awareness, mindfulness and individual process. Discussion around detailing the elements of the experience including seeing details, texture, chewing, tasting, and swallowing.

Encourage daily practice. Review Mindful breath handout to be experienced next session.

Finish with questions.

Session 2

Review previous session's discussion and questions arising.

Discussion of role of stress and relaxation in pain management, relaxation techniques and relevance to stress and tension management. Do a diaphragmatic breathing exercise with participants. Review chart for recording practice, review realistic expectations, and practice at home.

Mindfulness discussion: review and supplement information provided previous session on the principles of mindfulness; discuss universality of wandering mind; importance of the process of acceptance of this, acknowledgment and noting where mind wanders; gentle return to the focus of mindfulness; importance of process rather than outcome.

Introduce mind – body connection and experience of awareness.

Do mindful breathe exercise with participants. Distinguish between breathing relaxation and mindful breath exercise. Follow up on homework and experience. Review experience at making time, discuss obstacles.

Session 3

Review previous session's material and homework. Discuss activity cycling and goal setting. Review activity pacing, how to pace activities and how to calculate tolerance levels and baseline levels for beginning to pace activities. Review principles of Planning, Prioritizing, and Pacing. Review examples.

Introduce body scan technique. Discuss various physical mindfulness exercises including yoga as possible part of mindfulness meditation. NB: Yoga will not be practiced (due to limited resources) but will be discussed as part of learning process.

Mindfulness discussion: in today's society, we only attend to very salient experiences, missing many experiences that don't make it into conscious awareness. Note the constant distraction that prevents an awareness and appreciation of daily events. We skip pleasant events and focus on unpleasant events because they require attention. Note constancy of judgment of experience. Experiences outside of awareness still impact us. Discuss role of awareness with use of stress related examples. Elaborate on awareness, non-judgmental stance, and beginner's mind. Finish with body scan.

Session 4

Review previous session's material and homework. Discuss thinking styles, negative thoughts and feelings, negative thought cycles, and introduce thought diaries. Discuss impact of thinking styles and negative thoughts on pain management and ways of challenging thoughts. Acknowledge that we are half way through the group. Introduce diary of events, thoughts, feelings.

Mindfulness discussion: Review past session's practice and challenges. In today's life, we are faced with many challenges, many offer ample reason to avoid. Pain and its causes are another reason to avoid but avoidance does not make it go away. What does each of the participants avoid and does this increase or decrease stress. Note avoidance of activities and presence of judgment. Have any of these avoided activities / experiences / situations been noticed in mindfulness practice? Note the difference between reacting

and responding and how the former does not always lead to the best outcome. Note also the reactivity we experience and how this affects stress level and pain intensity. Discuss awareness of thoughts, non-judging, acceptance and letting go. Use examples from activity pacing. Finish with mindful walking.

Session 5

Review previous session's material and homework. Discuss role of anxiety and stress in the management of chronic pain. Review the various types of stress, living with stress, and relaxation strategies / stress management. Review thought diaries, change process, and coping thoughts. Also review sleep hygiene.

Mindfulness discussion: Open discussion to where people feel they are now and how they are doing. Examples of experiences? Challenges? Honoring, acceptance and observation of emotions. Note that this is part of process and reduce emphasis on outcome. Discuss patience as a principle in mindfulness.

Practice guided sitting meditation with emphasis on observing the thoughts as events in consciousness.

Session 6

Review previous session's material and homework. Review pain communication and patterns of communication. Distinguish active from passive communication and communication styles in different situations. Discuss patterns as each member experiences communicating pain and how to manage pain related behavior.

Questions and comments on process and obstacles.

Mindfulness discussion: review paradigm of wholeness and integration from mindfulness perspective including a reminder about the biopsychosocial model. Discuss holistic health care in contrast to traditional health care. Recognizing one's experience "as it is" includes that which does not pull one's attention. Development of skill to place attention and observe experience, especially painful areas of the body. Review questions. Finish with body scan or mindful walk.

Session 7

Review previous session's material and homework. Discuss set backs, set back planning and creating an individualized set back plan. Discuss various aspects of set back planning and how each of the topics over the group may be relevant to the creation of a setback plan.

Mindfulness discussion: Patience and acceptance in mindfulness. Note acceptance does not entail liking (which is a judgment). Discuss level of distraction during mindfulness practice and pain as distracter. Acknowledge frustration if present. Continue discussion of mind-body and holistic perspective and reductionism vs. synergy in accepting body as it is. Note if during individual practice, someone notices that pain fluctuates. Note change in perspective. Change in perspective can indicate shift in moving from body orientation to holistic orientation that puts pain in a different context.

Finish group with a quiet mindfulness exercise of each person's choosing and review which one each person picked, why, and how it was different from when first practiced.

Session 8: Last session.

Review previous session's material and homework. Wrap up with review of past 7 sessions materials; tie material together, discussion of miscellaneous topics. Discuss how to maintain practice of principles learned, and moving beyond the group. Review the set back plan.

Mindfulness discussion: brief overview of the principles discussed over the past 8 sessions. Discuss ideas to keep momentum going and how practice takes both formal and informal avenues. Discuss other books (ex. Thich Naht Han book). Body scan and breathe exercises with minimal guidance. Discuss difference in experience when guided or unguided.

Closing discussion.

Appendix F

Summary of group sessions for Psycho-education group

Structure and content taken from the group program provided at the Pain Management Unit, Royal National Hospital for Rheumatic Diseases, Bath, UK.

Session 1

Review of guidelines for participation and consent specifics (i.e. Voluntary participation)

Introduction of instructor with brief biography and brief intro for each participant.

Review group norms and rules. Discussion of Pain Gate theory, Acute vs. Chronic pain distinctions, use of medications and issues related to addiction, role of stress management in pain management. Introduce bio-psycho-social model. Discuss distinctions between addiction and physical dependence.

Session 2

Review previous session's discussion and questions arising.

Discussion of role of stress and relaxation in pain management. Relaxation techniques and relevance to stress and tension management. Do a diaphragmatic breathing exercise with participants. Review chart for recording, review realistic expectations, and practice at home.

Session 3

Review previous session's material and homework. Discuss activity cycling and goal setting. Review activity pacing, how to pace activities and how to calculate tolerance

levels and baseline levels for beginning to pace activities. Review principles of Planning, Prioritizing, and Pacing. Review examples.

Session 4

Review previous session's material and homework. Discuss thinking styles, negative thoughts and feelings, negative thought cycles, and introduce thought diaries. Discuss impact of thinking styles and negative thoughts on pain management and ways of challenging thoughts. Acknowledge that we are half way through the group. Explain diary of events, thoughts, feelings.

Session 5

Review previous session's material and homework. Discuss role of anxiety and stress in the management of chronic pain. Review the various types of stress, living with stress, and relaxation strategies / stress management. Review thought diaries, change process, and coping thoughts. Also review sleep hygiene.

Session 6

Review previous session's material and homework. Review pain communication and patterns of communication. Distinguish active from passive communication and communication styles in different situations. Discuss patterns as each member experiences communicating pain and how to manage pain related behavior. Questions and comments on process and obstacles.

Session 7

Review previous session's material and homework. Discuss setbacks, setback planning and creating an individualized set back plan. Discuss various aspects of setback planning and how each of the topics over the group may be relevant to the creation of a setback plan.

Session 8

Last session.

Review previous session's material and homework. Wrap up with review of past 7 sessions materials, tie material together, discussion of ho Review previous session's material and homework. How to maintain practice of principles learned, and moving beyond the group. Review the setback plan and contingency planning.

Closing discussion.

Appendix G: Consent



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OF MANITOBA

Informed Consent Form

Research Project Title: Chronic pain and mindfulness meditation: the role of spirituality

Researcher(s): Al-Noor Mawani, MA. Doctoral Candidate.

Sponsor: Dr. Michael Thomas (University of Manitoba), Dr. Bruce Dick (University of Alberta)

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Thank you for considering being a part of this research study. My name is Al-Noor Mawani and this research is part of my Doctoral Thesis. This research project will examine the role that mindfulness meditation can play in the management of chronic pain. Additionally, previous research has shown that spirituality can be an important part of the coping process. We are therefore also interested in how spirituality might impact or be impacted by this coping process.

In order to examine the role of mindfulness meditation in the management of chronic pain, we will be running group-based programs in one of two formats. Each group will run for eight weeks, once a week for two hours. One of the groups will incorporate basic knowledge about chronic pain including basic biology related to chronic pain, the relationship between stress and anxiety and chronic pain, the importance of thoughts and feelings in managing chronic pain, and the interplay between chronic pain and interpersonal relationships. In addition, we will be teaching various strategies that can be useful in managing chronic pain such as relaxation strategies, thought diaries, pacing activities, and how to develop a setback plan.

The second group will incorporate all of the elements of the group described above but will also include discussion and training on mindfulness meditation. Mindfulness meditation is a technique that has been used in various hospitals around the world for the management of chronic pain, depression, anxiety, and various stress related disorders. It is a technique that teaches one how to be aware of the various things that impact you, grabbing your attention, and affecting how you live.

Before you begin the group and at the end of the group, you will be asked to complete various questionnaires that ask you describe your pain and the impact your pain has in your life. We will also ask you to tell us a little about yourself, such as your age, religion, income, and other details about yourself. This information will help us better understand the different variables that impact upon chronic pain management. If you do not wish to answer certain questions, you are not required to do so. If you would like to see the questions, please ask and we can show you the form.

In each of the groups, you will be asked to review the material presented, to practice the skills discussed in group, and to attend group each week and perhaps share your experiences. As a part of the group, the practice between group sessions will vary depending upon the group session. The practice usually takes less than an hour per day but you will be the guide as to how much time to dedicate to the skills discussed. There is no requirement to share in group but sometimes, there is benefit in sharing your experiences. The things discussed with the group leaders will be held confidential. However, it is important to remember that there are other people in the group whom we will be asking to keep things discussed in group confidential. Unfortunately, we as group leaders cannot guarantee this. The forms you complete will be held confidentially in a locked office and only the researchers and a research assistant will have access. It is important for you to know that there are limits to confidentiality, as outlined in professional ethics and law. One of the limits relates to your personal safety. If you provide us with information that indicates that your personal safety may be at risk (thoughts of self harm for example), or that indicates someone else may be at risk due to your action, we would need to disclose this information directly to individuals or authorities that can help to maintain your safety or the safety of others, but we try to do so with your participation. Other limits will be discussed with you and you should make sure you ask any questions that help you to understand these limits. Your data will be kept for 7 years (as required by law) and will be destroyed in a secure and confidential way after this time.

At the bottom of this form, you will find a place for you to indicate whether or not you would be interested in feedback on the results of this study. If you are, please also provide your contact information. Study results will be available in approximately one year (June 2008) and will be forwarded to you if you indicate you would like to receive this information. You can change your mind at any time by contacting any of the researchers listed above.

You are not required to participate in this research study. Your participation is purely voluntary. If you should decide not to participate, you will be provided with an opportunity to participate in the standard group provided by the Pain Clinic and as recommended by your physician. There is no penalty for not participating and the options for treatment you receive will not be in any way impacted in any way if you should choose not to participate.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

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Appendix H

Debriefing form for Mindfulness Group.

Thank you for participating in this study. Your time, energy and commitment is not only appreciated by the researchers but contributes to our understanding of pain, pain management, and the role that mindfulness meditation can play in pain management. This study involved taking people such as yourself and training them in the principles of pain management as well as mindfulness meditation as applied to pain management. The research measured several aspects of psychological functioning. Primarily, pain perception was measured as a way of determining pain management, but mood and anxiety were also measured as these aspects of functioning are thought to effect pain management as well. Spirituality was also measured in this research project. However, in order to reduce the possibility of biasing your answers, spirituality was mentioned in the information letter, but not emphasized in the initial discussion or the group. It was hypothesized that as mindfulness practice developed and pain management increased (as measured by reductions in perceived and reported pain) self-reported spirituality would rise. The answers you gave in your questionnaires will be analyzed for correlations between pain management through the practice of mindfulness meditation and reported spirituality. One particular aspect of spirituality that is of particular interest involves Innerness, or a sense of inner peace and tranquility. It is thought that this sense of inner peace and tranquility will be strongly correlated with reductions in pain, thereby providing a potential link between spirituality and pain management as implemented through the practice of mindfulness meditation.

Mindfulness meditation is a practice that is gaining interest in clinical fields around the world, although meditation has been known to human society for centuries. You may know by now that there are a variety of meditative practices that you can learn and engage. Mindfulness is but one of these practices. However, mindfulness meditation has been researched for potential usefulness in a variety of areas including anxiety management, depression management, stress management, and pain management, to name a few. In this study, we also measured mood (sadness or depression), anxiety, and stress level. It is thought that reductions in anxiety, depressive or sad feelings, and stress will also be correlated with increases in spirituality.

It is hoped that you have found participation in this study useful and a learning experience. If you would like to learn more about mindfulness meditation, you will find a couple of sources at the bottom of this page. Additionally, you can contact the researcher who would be happy to provide additional resources to you. Remember that to maintain the skills you have learned over the past eight weeks, you will need to practice them. Good luck in your mindfulness practice and thank you again for participating in this study.

Thick Naat Haan, [The miracle of mindfulness.](#)
 Jon Kabat-Zinn, [Full Catastrophe Living.](#)

Appendix I

Debriefing form for Psychoeducation Group.

Thank you for participating in this study. Your time, energy and commitment is not only appreciated by the researchers but contributes to our understanding of pain, pain management, and the role that mindfulness meditation can play in pain management. This study involved taking people such as yourself and training them in the principles of pain management. The research measured several aspects of psychological functioning. Primarily, pain perception was measured as a way of determining pain management, but mood and coping were also measured as these aspects of functioning are thought to effect pain management as well. Spirituality was also measured in this research project. However, in order to reduce the possibility of biasing your answers, spirituality was mentioned in the information letter, but not emphasized in the initial discussion or the group. In this research, there was another set of groups that were run that included Mindfulness Meditation as a part of the teachings. Mindfulness meditation is a practice that is gaining interest in clinical fields around the world, although meditation has been known to human society for centuries. As you may or may not know, there are a variety of meditative practices that you can learn and engage. Mindfulness is but one of these practices. Mindfulness meditation has been researched for potential usefulness in a variety of areas including anxiety management, depression management, stress management, and pain management, to name a few.

It was hypothesized that as mindfulness practice developed, we would be able to measure a relationship between pain management (as measured by reductions in perceived and reported pain) and self-reported spirituality. You attended a group that allowed us to measure what happens to spirituality while taking the group without the mindfulness component. The questionnaires you completed will be analyzed for correlations between pain management and reported spirituality. One aspect of spirituality that is of particular interest involves Innerness, or a sense of inner peace and tranquillity. It is thought that this sense of inner peace and tranquillity will be correlated with reductions in pain, thereby providing a potential link between spirituality and pain management. We are interested in better understanding this relationship and how clinicians can enhance pain management, as well as the role that mindfulness plays in this process. In this study, we also measured mood (sadness or depression) and anxiety. It is thought that reductions in anxiety, depressive or sad feelings, and stress will also be correlated with increases in spirituality.

It is hoped that you have found participation in this study useful and a learning experience. Again, you were involved in a group that did not included mindfulness meditation. If you would like to learn more about mindfulness and feel that the clinic may be able to help you in this goal, please feel free to ask us at the clinic and we will discuss the various options with you. You will find a couple of sources at the bottom of this page. Additionally, you can contact the researcher who would be happy to provide additional resources to you. Thank you again for participating in this study.

Thick Naat Haan, [The miracle of mindfulness](#), Jon Kabat-Zinn, [Full Catastrophe Living](#).