

Minnesota Department of Corrections Inpatient Pain Management Program Evaluation

by

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**ABSTRACT**

This research is an evaluation of the Inpatient Pain Management Program (IPMP) at the Minnesota Department of Corrections (MN DOC) in Shakopee, Minnesota. The Shakopee facility was the first MN DOC site to implement a structured chronic pain management program. The IPMP is a 3-month, group-based multidisciplinary program with a focus on the biological, psychological, and social aspects of chronic pain. The IPMP was developed to reduce symptoms of chronic pain, and in turn, to decrease the frequency of medical, nursing, and mental health visits among offenders. This research also examined the incidence of misconduct among offenders, to see if a decrease in chronic pain symptoms would result in lowered incidence of misconduct for MN DOC offenders.

The present research is an analysis of quantitative data previously collected by MN DOC staff. Statistical testing determined there was a substantial and significant decrease in the number of medical, nursing, and mental health visits pre to post-program implementation. These results highly support a reduction in chronic pain symptoms and an increase in chronic pain self-

management and control in IPMP completers. There was no difference in misconduct incidents pre to post-program implementation. The MN DOC is saving approximately \$2,688 to \$3,251 per year for each offender participating in the IPMP. If the approximately 1,038 offenders who suffer from chronic pain within the MN DOC were to participate in the IPMP, the MN DOC would be saving approximately \$2,790,144 to \$3,388,032 dollars each year. Additional research is needed to better understand the severity of chronic pain symptoms among offenders, as well as to have a better understanding of the program processes leading to successful program outcomes.

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## Chapter I: Introduction

Chronic pain is a demoralizing situation which causes people to feel intense unexplained symptoms of prolonged and persistent pain (Gatchel, Peng, & Peters, 2007). In addition, individuals who suffer from chronic pain report lower quality of life and emotional functioning, and often feel stressed, hopeless, and experience symptoms of depression and anxiety (Gatchel et al., 2007). Each year over 70 million people visit physicians seeking chronic pain treatment (Bailey, Freedenfeld, Sanford, Kiser, & Gatchel, 2003; Gatchel et al., 2007).

This research focuses on the evaluation of the Inpatient Pain Management Program (IPMP) at the Minnesota Department of Corrections (MN DOC) in Shakopee, Minnesota. Various members of the MN DOC Behavioral Health staff have expressed concern regarding identifying and treating offenders with chronic pain in the prison system (personal communication, D. Latuseck, K. Shinnick, & S. Allen, 2007 to present). Currently, no literature exists which examines the prevalence of chronic pain in the offender population. Although the prevalence is unknown, the incidence is likely to be high due to the number of offenders who have experienced traumatic brain injury, chemical and drug dependency, and childhood sexual or physical abuse, all of which contribute to increased prevalence of chronic pain in the general population (Clark, Stoller, & Brooner, 2008; Davis, Luecken, & Zautra, 2005; Green, Flowe-Valencia, Rosenblum, & Tait, 2001; Lampe et al., 2003; Nampiaparampil, 2008).

In the United States, it is estimated that approximately 1.7 million people experience traumatic brain injuries each year (Injury Prevention and Control: Traumatic Brain Injury, 2010). Approximately 51.5% of individual who undergo traumatic brain injury experience symptoms of chronic pain (Nampiaparampil, 2008). Literature examining prison inmates found a high prevalence of reported traumatic brain injuries among women. Specifically, this research found that 42% of female inmates reported experiencing traumatic brain injury due to their

involvement in violent situations (Brewer-Smyth, Burgess, & Shults, 2004). Due to the high incidence of chronic pain in the general population, it is very likely that offenders who have experienced traumatic brain injury are experiencing chronic pain at similar levels.

In the general population, individuals with alcohol and drug dependency also experience chronic pain at an increased level. It is estimated that between 30 and 60% of drug and alcohol dependent individuals experience symptoms of chronic pain (Clark et al., 2008). Research indicates that 65.3% of female offenders reported that they used drugs regularly before entering prison and 19% reported daily alcohol use, indicating a high prevalence of substance abuse in the prison system (Snell & Morton, 1994). It is very likely that chemically dependent offenders are also experiencing symptoms of chronic pain at levels similar to those who are chemically dependent in the general population.

The incidence of childhood sexual and physical abuse also strongly correlates with the presence of chronic pain symptoms in the general population (Davis et al., 2005; Green et al., 2001; Lampe et al., 2003). It is estimated that 12% of physically abused individuals and 11% of sexually abused individuals experience intense pain that consistently interferes with daily life (Chartier, Walker, & Naimark, 2007). Research indicates approximately 35.5% of the offender population has been physically abused and 33.9% has been sexually abused (Snell & Morton, 1994). Thus, there is further support for the indication that chronic pain in the prison population is likely to be similar to those who have experienced childhood physical and sexual abuse in the general population.

Previous attempts to treat chronic pain have focused on treating physical symptoms, mainly via pain medication, or by treating psychological symptoms, mainly via cognitive behavioral therapy (Turk & Burwinkle, 2005). More promising research has determined that the

most successful treatment modality appears to be group-based multidisciplinary treatment programs (Gatchel et al., 2007; Hoffman, Papas, Chatkoff, & Kern, 2007; Newton-John & Geddes, 2008; Scascighini, Toma, Dober-Spielmann, & Sprott, 2008; Turk & Burwinkle, 2005). Group-based multidisciplinary treatment of chronic pain treatment has been shown to be much more effective in not only reducing symptoms of chronic pain, but also alleviating the emotional symptoms of chronic pain.

### **Statement of the Problem**

As discussed above, the prevalence of chronic pain in the MN DOC offender population is likely to be high. At the MN DOC offenders with chronic pain have frequently been reported as ‘difficult’, as members of this sub-population frequently send ‘kites’ to the Behavioral Health staff regarding emergent chronic pain suffering. Partially due to the significant number of individuals requesting chronic pain treatment, the Shakopee women’s facility developed the group IPMP, which was implemented in January, 2009. To date, the IPMP has never been evaluated for effectiveness in reducing chronic pain symptoms or decreasing health care utilization.

### **Purpose of the Study**

The purpose of this study is to evaluate the IPMP at the MN DOC in Shakopee, Minnesota for its effectiveness in reducing medical, nursing, and mental health visits and inmate misconduct occurrence. It is anticipated that the results of this research can be used to support program replication of the pain management program at other MN DOC sites.

### **Assumptions of the Study**

It is assumed that there is no difference in response to chronic pain treatment across genders.

### **Limitations of the Study**

This research is limited in that no pain measures were used to measure the level of chronic pain severity among offenders. Thus, decreases in health care utilization cannot be automatically contributed to reduced chronic pain symptoms.

### **Methodology**

This research used data previously collected by the MN DOC. This data includes frequency of medical visits, nursing visits, mental health visits, and misconduct incidents, pre, during, and post-program implementation. The average frequency of incidents was calculated pre, during, and post program implementation for each offender who participated in the IPMP. The average number of visits was calculated by determining the number of medical, nursing, mental health, or misconduct incidents, and dividing by the number of days incarcerated pre, during, and post program implementation.

Four one-way analysis of variance tests were performed to see if there was a significant difference in number of incidents for each of the four variables (medical, nursing, mental health, and misconduct) before, during, and after program implementation. For each significant difference that was found, a between-subjects t-test was performed to identify where the differences occurred. For each significant t-test, effect size was also calculated.

In order to estimate the amount of money saved due to the large decrease in utilization of health care services, two methods were used to estimate the gross savings per individual for participating in the IPMP. The gross savings was first calculated using the estimated cost for one

medical, nursing, and mental health visit, and determining the amount of money saved by reducing the number of medical, nursing, mental health, and misconduct incidents. It was also calculated based on the expected cost for providing health care to one offender for one year, and determining what percentage of this cost was saved by reducing health care utilization.

## **Chapter II: Literature Review**

Chronic pain is a demoralizing situation that has a significant impact on life functioning. Although chronic pain is not consistently defined by all authors, it is characterized by prolonged and persistent pain lasting at least three months in duration (Clark et al., 2008; Gatchel et al., 2007). Chronic pain is a complex phenomenon, with physical, emotional, and social attributes. It's most common physical attributes include severe pain or muscle ache in the neck, back, or spinal cord, and headaches (Gatchel et al., 2007; Nampiarampil, 2008). Chronic pain significantly affects emotional functioning and frequently leaves people feeling stressed, demoralized, and hopeless (Gatchel et al., 2007). Chronic pain can also cause severe depression, anxiety, anger, and negative self-image (Kelly & Clifford, 1997). It also affects social functioning; specifically, it has consistently been shown to negatively affect relationships with others, causing chronic pain sufferers to isolate family members, friends, and social activities (Gatchel et al., 2007; Kelly & Clifford, 1997).

### **Prevalence of Chronic Pain**

The prevalence of chronic pain in the general population has been reported to be between 2 and 40% with an estimated population prevalence of 10% (Verhaak, Kerssens, Dekker, Sorbi, & Bensing, 1998). Each year 70 million people visit physicians for treatment of pain and 80% of all physician visits are for chronic pain (Bailey et al., 2003; Gatchel et al., 2007). In the general population, certain subpopulations are more affected by chronic pain than others. These subpopulations include individuals with traumatic brain injury, chemical dependency/abuse, and those with a history of physical or sexual abuse.

The Center for Disease Control estimates that 1.7 million people in the United States undergo traumatic brain injuries each year (Injury Prevention and Control: Traumatic Brain Injury, 2010). Traumatic brain injuries occur when an object forcefully strikes the head or

penetrates the skull, or if the brain undergoes sudden increased or decreased movement (Nampiarampil, 2008). People who have experienced physical trauma and brain injuries of this nature are more likely to experience chronic pain (Nampiarampil, 2008). It is estimated that the prevalence of chronic pain in individuals with traumatic brain injury is approximately 51.5% (Nampiarampil, 2008). This estimate is well above the highest estimates of the prevalence of chronic pain in the general population (Verhaak et al., 1998).

Individuals with alcohol or drug dependency also experience chronic pain at significantly higher rates. The prevalence of chronic pain among chemically dependent individuals has been estimated to be between 30 and 60% (Clark et al., 2008). Among patients in chemical dependency treatment programs, approximately 37% were found to have suffered from chronic pain (Rosenblum, Joseph, Fong, Kipnis, Cleland, & Portenoy, 2004). Again, these estimates of prevalence are well above the estimated rates of chronic pain in the general population (Clark et al., 2008; Verhaak et al., 1998).

The experience of childhood physical abuse, sexual abuse, and stressful life events also appear to contribute to the presence of adult chronic pain (Davis et al., 2005; Green et al., 2001; Lampe et al., 2003). Many individuals with a childhood history of physical abuse have higher rates of fibromyalgia (i.e. unexplained chronic pain) as adults (Balousek, Plane, & Fleming, 2007). A meta-analysis of physical and sexual abuse literature reported that although the causal direction of the correlation between physical and sexual childhood abuse is unclear, childhood abuse is a risk factor for the presence of chronic pain in adulthood (Davis et al., 2005). Further research, examining reported pain differences between abused and non-abused individuals, reported that 12% of physically abused individuals and 11% of sexually abused individuals reported pain (defined as interfering with daily activities), whereas only 8% of individuals

without physical abuse and 9% of individuals without sexual abuse reported pain that interferes with daily activities; results indicated a statistically significant difference in pain for victims of physical abuse (Chartier et al., 2007).

### **Causes of Chronic Pain**

The cause of chronic pain is a mysterious and complex issue that to this day remains unclear (Solberg, Roach, & Segerstrom, 2009). There are two main models of chronic pain etiology discussed in the literature: A medical model and a biopsychosocial model. In the first, chronic pain is believed to be the result of tissue or nerve damage resulting from an injury or illness, and thus lack of central nervous system functioning (Solberg et al., 2009). Specifically, when the body senses pain it sends a signal from the spinal cord to the brain. Chronic pain may be the result of the malfunction of certain regions of the brain or the nervous system to properly relay this information (Solberg et al., 2009).

Repeatedly, chronic pain research demonstrates that the severity of chronic pain symptoms are not just a result of physiological causes, but there are also psychological and social etiologic components (Turk & Okifuji, 2002). The biopsychosocial model attributes biological, psychological (feelings, thoughts, emotions), and social factors as all playing a significant role in the experience of chronic pain. Psychosocial factors can play a causal role in the severity of an individual's chronic pain experience. More frequently, these factors, although not directly causing chronic pain independently, can significantly exacerbate the pain experience and increase the distress and disability experienced by chronic pain sufferers (DeLeo, 2006). For example, feelings of distress over deteriorating social relationships or of dependence or lack of control over pain symptoms may worsen chronic pain symptoms; on the other hand a positive



sense of control and independence over pain symptoms may help alleviate and lessen the pain experience (Turk & Okifuji, 2002).

### **Impact on Life Functioning**

Chronic pain is distinguishable from acute pain in that it is consistent, unexplained, and lasts for three months or longer (Clark et al., 2008; Gatchel et al., 2007). As chronic pain persists, often due to lack of treatment success, it begins to negatively impact many aspects of a person's life (Benrud-Larson & Wegener, 2000). Physical effects of chronic pain may worsen, such as neck, spinal, and back pain. Severity of headaches or other physical side effects may also intensify.

As pain worsens, emotional consequences often amplify as well. Many people experience feelings of anxiety and depression (Banks & Kerns, 1996). As pain continues, people often become hopeless that their pain will ever alleviate, often leaving people feeling emotionally drained and demoralized (Gatchel et al., 2007).

Social relationships are also often negatively affected by prolonged chronic pain. Many individuals experience problems in their relationships with family and friends (Kelly & Clifford, 1997). Often family members and friends of chronic pain sufferers feel emotionally drained and stressed as well (Benrud-Larson & Wegener, 2000). Other chronic pain patients experience loss of employment or unpaid work time which can greatly affect their financial security and healthcare benefits (Thorn & Boothby, 2002).

### **Treatment of Chronic Pain**

Although it is very difficult to effectively treat chronic pain (Scascighini et al., 2008), there are several methods in which chronic pain is currently treated (Turk & Burwinkle, 2005).

The three main categories of chronic pain treatment are medically-based, psychologically-based, and biopsychosocially-based treatment.

Medical treatment attempts to treat chronic pain by focusing on the physiological component of pain, for example with medical treatment such as medication or surgery. Treatment of this nature usually attempts to desensitize or eliminate pain by blocking the communication between the spinal cord and the brain; however, these medical approaches typically do not fully alleviate, let alone cure pain, leading chronic pain sufferers to seek further treatment (Hoffman et al., 2007).

Psychological treatment attempts to alter the emotional, cognitive and social components of chronic pain, for example with counseling or cognitive behavioral therapy. Chronic pain treatment methods which focus on psychological methods of chronic pain attempt to teach chronic pain sufferers how to self-manage and maintain control over their pain symptoms in efforts to decrease pain experiences overall (Turk & Okifuji, 2002).

### **Medically Based Treatment Model**

The most common modality of the medically based treatments is pain medication. Opioids are the most commonly prescribed prescription medication for chronic pain; tricyclic antidepressants and anticonvulsant medications are also commonly used (Turk & Burwinkle, 2005). This modality has been shown to be mildly effective. Yet, the majority of individuals who receive this treatment still experience significant and prolonged chronic pain for months or years after (Newton-John & Geddes, 2008; Turk & Burwinkle, 2005). There is also moderate risk of addiction and abuse associated with consistent opioid use; addiction rates among patients prescribed opioid drugs are estimated to be anywhere between 3.2 and 18.9% (Dickinson, Altman, Nielsen, & Williams, 2000).

The second most common treatment method is surgical, for example back surgery. The efficacy data for this treatment approach is also mixed, as some studies report that up to 70% of individuals who undergo surgery in attempt to alleviate pain, experience continued or worsened post-surgical pain (Turk & Burwinkle, 2005). There are other less common treatments for chronic pain, for example shock therapy and spinal cord anesthesia, with these methods inconsistently demonstrating success (Turk & Burwinkle, 2005).

### **Psychologically Based Treatment Model**

Psychologically based treatment of chronic pain attempts to alter the psychological processes that are thought to contribute to chronic pain as well as the effects chronic pain has on life functioning. The purpose is to reduce or eliminate chronic pain, but also to treat emotional effects of chronic pain for example stress, depression, and anxiety, as well as social effects such as relationship dysfunction and social isolation (Eccleston, Williams, & Morley, 2009).

There are two main classes of psychological treatment: Cognitive Behavioral Therapy and Behavioral Therapy. Many studies have shown that intense chronic pain limits cognitive ability, and the ability to control and regulate emotions, thoughts, feelings, and behavior (Solberg et al., 2009). Both Cognitive Behavioral Therapy and Behavioral Therapy focus on the relationship between pain and behavior, and teach patients to avoid unpleasant experiences and situations where pain is intensified; however, Cognitive Behavioral Therapy also attempts to treat the thoughts and feelings experienced by chronic pain sufferers (Eccleston et al., 2009). The premise behind Cognitive Behavioral Therapy and Behavioral Therapy is that if an individual can change the way they think or emotionally respond to their pain, they can effectively control their perceptions of pain, in effect reducing their pain. Research literature indicates behavioral

therapy has been inconsistent in effect, while Cognitive Behavioral Therapy shows more promise in reducing chronic pain, and improving disability and mood (Eccleston et al., 2009).

### **Biopsychosocial Treatment Model**

The most promising chronic pain treatment that exists is the multidisciplinary approach (Gatchel et al., 2007; Hoffman et al., 2007; Newton-John & Geddes, 2008; Scascighini et al., 2008; Turk & Burwinkle, 2005). The multidisciplinary approach has a biopsychosocial philosophy, viewing the cause and treatment of chronic pain as an integration of biological, psychological and social factors. It involves a group of professionals from across professional domains (e.g. medicine, psychology, physical therapy, recreation therapy, exercise) working as a team to help chronic pain sufferers better control and self-manage their pain experience (Turk & Burwinkle, 2005).

A critical aspect of the multidisciplinary approach is the examination of psychological phenomenon and its impact on the etiology, maintenance, and treatment of chronic pain. With this treatment method, psychologists can integrate cognitive behavioral therapy and work with patients to help them understand the physiology of their pain, how to control their pain, communication and coping skills, and other techniques such as relaxation and breathing techniques (Turk & Burwinkle, 2005). Health care professionals not only consult with patients on available medical treatments, but they also work with psychologists and other health care providers to assist patients in coping with their pain (Turk & Burwinkle, 2005). This approach places the responsibility for chronic pain management on the person experiencing the pain; not with the medical or behavioral staff. A group in-patient or out-patient format is typically used in multidisciplinary pain management programs.

The efficacy in reducing chronic pain is significantly higher in these programs than by medical treatment alone (Scascighini et al., 2008). A meta-analysis of 35 multidisciplinary treatment programs determined that the majority of programs had successful outcomes as measured by reduced psychological strain and disability, improved quality of life, improved communication and coping strategies, and reduced chronic pain symptoms (Scascighini et al., 2008).

### **Cost of Treatment**

Each year the United States spends approximately 70 billion dollars due to the high incidence of chronic pain (Bailey et al., 2003). These costs include factors such as medical care visits, disability compensation, loss of employment, and loss of productivity (Turk & Burwinkle, 2005). Chronic pain sufferers who seek out treatment in facilities spend anywhere from \$1,380 to \$97,670 in attempt to alleviate their pain (Turk & Burwinkle, 2005). There are also extreme differences in cost of medical and psychological treatment of chronic pain.

Every year millions of prescriptions are written for medications designed to alleviate chronic pain symptoms. Although this form of treatment has been shown to be mildly effective, medication costs can be extremely high, and this treatment method, in most cases, does not cure chronic pain nor completely eliminate symptoms (Turk & Burwinkle, 2005).

Surgical treatment for chronic pain, especially chronic back pain, although one of the most common treatment modalities, appears to be very unsuccessful. As noted above most people who undergo surgery do not feel pain relief and only 20% of individuals reported being pain free 5 years after undergoing surgery (Turk & Burwinkle, 2005). Due to surgical costs that can exceed \$25,000, this treatment has consistently shown not cost-effective (Turk & Burwinkle, 2005).

The most cost-effective treatment modality appears to be the multidisciplinary approach. It is estimated that the approximate cost per person for multidisciplinary treatment is \$14,000, substantially less per year per individual than standard medical or surgical treatment (Turk & Burwinkle, 2005). Approximately 45-50% of individuals treated for chronic pain using this method return to work where as only 20% of individuals who receive back surgery and 13-25% of those who receive spinal cord stimulation return to work. Because of the significant decrease in money from lost work time, the multidisciplinary approach is over ten times more cost-effective than standard medical and spinal cord stimulation treatment methods and over 25 times more cost-effective than back surgery (Turk & Burwinkle, 2005).

### **Prison Population**

Chronic pain in the incarcerated population has not been systematically researched. Specifically, to date there has been no published research examining the prevalence, course, impact or any other aspect of chronic pain within the offender population.

To garner 'hints' of prevalence estimate 'within the offender population, one must turn to the literature of non-offender sub-populations which share relevant features with the offender population: traumatic brain injury, physical or sexual childhood abuse, and substance abuse histories. Since the chronic pain prevalence estimates within these populations are known, and also known is the extent of each sub-population within the offender population, through simple math, one can attain estimates of chronic pain prevalence within the offender group.

### **Traumatic Brain Injury in the Prison Population**

Research examining prison inmates found that 42% of female inmates reported traumatic brain injury due to violence against the inmate or other risky behavior (Brewer-Smyth et al., 2004). As mentioned above, it is estimated that the prevalence of chronic pain in individuals

who undergo traumatic brain injury is approximately 51.5% (Nampiarampil, 2008). Thus, it is feasible that 51.5% of female offenders in the prison population who have undergone traumatic brain injury suffer from chronic pain.

### **Substance Abuse in the Prison Population**

The Federal Bureau of Justice Statistics reported that almost 50% of female offenders reported committing their offence under the influence of alcohol while 36.3% reported being under the influence of drugs at the time of their offence (Snell & Morton, 1994). 65.3% of female offenders also reported that they used drugs regularly before entering prison and 19% reported daily alcohol use, indicating a high prevalence of substance abuse in the prison system (Snell & Morton, 1994). As stated above, individuals who are chemically dependent in the non-offender population have an estimated chronic pain prevalence rate between 30 and 60% (Clark et al., 2008). Of the 19% of female inmates who before entering prison used alcohol daily, indicating abuse, 30 to 60% of this number suggests a chronic pain prevalence rate between 5.7 and 11.4% in female offenders who abuse alcohol. Of the 65.3% of female inmates who reported regular drug use before entering prison, a prevalence rate between 30 to 60% in the non-offender population suggests that between 19.6 and 39.2% of female inmates with drug abuse problems suffer from chronic pain.

### **Abuse History in the Prison Population**

It was also reported that 33.5% of women reported a history of physical abuse and 33.9% reported a history of sexual abuse before entering prison (Snell & Morton, 1994). As stated above, for individuals with a history of physical abuse, 12% reported pain interfering with their daily lives; for those with a history of sexual abuse, 11% reported pain interfering with their daily lives (Chartier et al., 2007). This indicates that approximately 4.0% of offenders with a

history of physical abuse likely suffer from pain interfering with their daily lives and 3.7% of offenders with a history of sexual abuse likely suffer from pain interfering with their daily lives.

Overall, research on the three sub-populations discussed above give hints as to the level of CP expected in offender populations. It is thus very probable that the prevalence of chronic pain in the offender population is higher than that found in the general population, with estimates of the latter ranging from 10.8 to 15.9%.

### **Minnesota Department of Corrections**

Various members of the MN DOC Behavioral Health staff have expressed concern regarding identifying and treating offenders with chronic pain in the prison system (D. Latuseck, K. Shinnick, & S. Allen, personal communication, 2007-present). Further, they have subjectively ascertained that the prevalence of chronic pain in the MN DOC offender population is likely to be high.

The offender population in the state of Minnesota as of January, 2010 is 9,619. Applying the mathematical reasoning as above, it is projected that approximately 1,038 to 1,529 individuals in the Minnesota Corrections System suffer from chronic pain. Not surprisingly, given the psychological sequelae of chronic pain, MN DOC offenders with chronic pain have been reported as ‘difficult’, frequently sending ‘kites’ to the Behavioral Health staff regarding emergent chronic pain suffering (D. Latuseck, K. Shinnick, & S. Allen, personal communication, 2007-present). The MN DOC Behavioral Health Staff have further noticed a significantly high incidence of medical, mental health, and nursing visits among male and female offenders experiencing chronic pain. Regarding mental health, preliminary data suggests that for MN DOC offenders with chronic pain, there is a high prevalence of depression and anxiety, as



indicated by the Beck Depression Inventory and the Becks Anxiety Inventory (K. Shinnick, personal communication, 2007-present).

There also appears to be an increased incidence in misconduct behavior in this population of offenders. MN DOC staff has noticed an increase in the number of offenders who receive loss of privileges or segregation time due to misconduct behavior and attribute this increase to the presence of chronic pain (K. Shinnick, personal communication, 2007-present).

It is for all the above that there has been interest for some time within the MN DOC to develop a chronic pain treatment program for offenders. No current literature exists that discusses or examines chronic pain management programs in correctional settings and MND OC would be innovative in doing so. Development of chronic pain programs could not only improve offender quality of life (both physically and emotionally) but could also reduce chronic pain-related health care and mental health visits, effectively reducing unnecessary costs for correctional facilities

### **Inpatient Pain Management Program at the MN DOC in Shakopee, Minnesota**

Due to the apparent need for a chronic pain treatment program in the offender population and the significant number of individuals requesting chronic pain treatment, the Shakopee women's facility developed a group IPMP, which was implemented in January, 2009. It was the first MN DOC to implement a structured pain management program.

The IPMP is a 3-month, group-based multidisciplinary program. Participants of the program are either self-referred or referred by a medical provider. Offenders who are invited to participate in the program are housed in a separate building at the MN DOC Shakopee site. The participants follow a strict schedule designed to provide psycho-education, skills, and therapy.

Offenders participate in many activities which help them to better understand and deal with the physical and emotional symptoms of their chronic pain.

It is anticipated that the IPMP program will reduce medical and mental health visits, decrease offender misconduct, increase life functioning and well-being, and increase management of physical and emotional pain (K. Shinnick, personal communication, October, 2009). However, the IPMP has yet to be objectively evaluated and therefore its effectiveness is unknown.

The purpose of this research is to analyze existing data previously and routinely collected by the MN DOC. Specifically, existing data will be reviewed to extract relevant outcome data. This research will examine data from the statewide correction database, Corrections Offender Management System (COMS). The outcomes of interest are number of medical visits, number of mental health visits, number of nursing visits, and number of misconduct incidents pre- and post-IPMP treatment.

This research will provide objective information on the effectiveness of the IPMP in Shakopee, Minnesota. The MN DOC may use this information for continued development of the IPMP and for MN DOC pain-management program replication efforts at other state correctional facilities.

### **Chapter III: Methodology**

The goal of this research was to analyze data previously collected by the directors of the IPMP and the MN DOC. Specifically, existing program-related documents were reviewed to extract outcome data. This research examined data from the statewide correction database, Corrections Offender Management System (COMS). MN DOC staff plan on utilizing the information gained from this research to enhance the existing IPMP at the women's facility in Shakopee, to guide potential pain-management program replication at other MN DOC facilities, and to add to the general body of knowledge regarding chronic pain management in the offender population.

#### **Subject Selection and Description**

All participants of the IPMP were incarcerated at the MN DOC in Shakopee, Minnesota during program implementation. During January 2009 to the present, the IPMP completed five different program cycles, with participants in each cycle representing a cohort group. Across cohort groups, N=40 female offenders freely consented to and participated in the IPMP. Each cohort group consisted of six to ten individuals.

Participants of the IPMP were either self-referred or medically referred by MN DOC staff. Self-referred offenders sent memos, or "kites", to Behavioral Health staff requesting need for chronic pain treatment and desire to enroll in the IPMP. Medically-referred offenders were recognized by Behavioral Health, Medical, or Nursing staff to be in need of chronic pain treatment due to the frequency of medical and nursing visits for chronic pain, or behavioral issues resulting from chronic pain such as offender misconduct.

Offenders were enrolled in the IPMP based on observed need. Participants who were most in need of chronic pain treatment as perceived by the MN DOC staff were the first to be admitted to the program. Once the offender was accepted into the program, she read a full

description of the program contents, activities, rules and regulations, and signed an agreement form indicating her consent to participate, including data collection.

### **Data Collection Procedures**

MN DOC staff extracted data from COMS to analyze outcomes of interest. Number of medical visits, number of mental health visits, number of nursing visits, and number of misconduct incidents for each offender were collected for two time periods: During the full calendar year prior to each individual's program start date and post IPMP after program completion up until November of 2009 when the data was retrieved. The researcher also extracted additional data from COMS: Offender incarceration and release date, in order to calculate how many days the offender was incarcerated pre- and post-program implementation.

### **Calculation of New Variables**

To assess the impact of the IPMP on the outcome variables of interest, new variables need to be created. For each individual, the following new variables will be created: the average number of medical visits, nursing visits, mental health visits, and misconduct incidents per month before, during, and after the IPMP. The general formulas for creating the above variables are as follows.

#### **Pre-program Individual Outcome Variables**

To ensure equality when comparing data across participants, each individual's frequency of outcome occurrences prior to the IPMP program start will be divided by the number of days they were incarcerated before the program started. If a participant was incarcerated for more than a year before their program start date, data will only be collected up to a year pre-program implementation. Each average will be multiplied by 30 to calculate frequency of medical, nursing, mental health, and misconduct incidents per month. Resulting scores will range

between 0 and 30+, with 0 indicating a lack of medical, nursing, mental health, or misconduct incidents during the time period in question (i.e. pre, during, post treatment) and 30 indicating an average of 1 visit or incident per day. These new variables will be called pre-program medical visits individual monthly average (PreMedIndAvg), pre-program nursing visits individual monthly average (PreNurIndAvg), pre-program mental health visits individual monthly average (PreMHIndAvg), and pre-program misconduct individual monthly average (PreMCIndAvg).

### **During Program Individual Outcome Variables**

A similar method will also be used to calculate the average number of outcome occurrences during program implementation. The frequency of medical visits during program implementation will be divided by the number of days participated in the program. Each average frequency will be multiplied by 30 to create an average monthly frequency of medical visits, nursing visits, mental health visits, and misconduct incidents during the program. These new variables will be called during-program medical visits individual monthly average (DuringMedIndAvg), during-program nursing visits individual average (DuringNurIndAvg), during-program mental health visits individual monthly average (DuringMHIndAvg) and during-program misconduct individual monthly average (DuringMCIndAvg).

### **Post-program Individual Outcome Variables**

Post-program outcomes will be calculated by dividing the frequency of outcome occurrence after program completion by the number of days post-program completion. If an individual is still incarcerated on the date data is retrieved from COMS, the number of days post-program will include all days up from program completion until the COMS retrieval date indicated. Each average frequency will be multiplied by 30 to create an average monthly frequency of medical visits, nursing visits, mental health visits, and misconduct incidents per

month after the program. These new variables will be called post-program medical visits individual monthly average (PostMedIndAvg), post-program nursing visits individual average (PostNurIndAvg), post-program mental health visits individual monthly average (PostMHIndAvg) and post-program misconduct individual monthly average (PostMCIndAvg).

### **Group Mean Outcome Variables**

Individual outcome variables will be averaged to calculate the mean monthly frequency of medical visits (AvgMed), nursing visits (AvgNur), mental health visits (AvgMH), and misconduct incidents (AvgMC) across all participants for all three time periods: pre, during and post treatment (e.g. AvgMedPre, AvgMedDur, AvgMedPost).

### **Data Analysis**

Means and standard deviations will be calculated to compare the frequency of medical visits, nursing visits, mental health visits, and misconduct incidents before, during, and after the IPMP has been implemented. Frequencies will also be calculated to determine the number of days each individual was incarcerated pre and post-program implementation.

Multiple one-way repeated measures analysis of variance (ANOVA) tests will be performed using SPSS. Each test will be conducted to assess the change in average number of medical visits, nursing visits, mental health visits, or misconduct incidents across the three time periods: pre, during, and post-program implementation.

Planned paired samples t-test will be performed if an ANOVA is found significant at an  $\alpha \leq .05$  level. To control for family-wise error rate, planned paired sample t-tests will be performed at an  $\alpha \leq .017$  level (e.g.  $.05/3$ ). For significant t-test findings, Cohen's d effect size will be calculated, using both pooled and unpooled population variance estimates.

**Health Care Utilization Costs**

If significant differences are found between the number of visits for each category (medical, nursing, and mental health) pre-program implementation to post-program implementation, the total cost savings of these changes will be estimated. Two different methods will be used to estimate the amount of money saved based on the reduction in use of health care services. The first approach, termed MN DOC Cost/Individual, will estimate the cost savings by taking the approximate cost of one medical, nursing, or mental health visit for offenders within the MN DOC. The amount of money saved will be determined based on the reduction in number of visits for each of the three categories.

Second, it is estimated that state prison systems spend \$1,950 per individual in health care costs each year (Sourcebook for Criminal Justice Statistics, 1997). The second approach, termed State Cost/Individual, will estimate the cost savings as a percentage of \$1,950, based on the percentage in decrease of health care usage pre-program implementation to post-program implementation. The latter calculations were determined by following the format used in previous research examining reduction of health care utilization in prison offenders (Magill, 2003).

## **Chapter IV: Results**

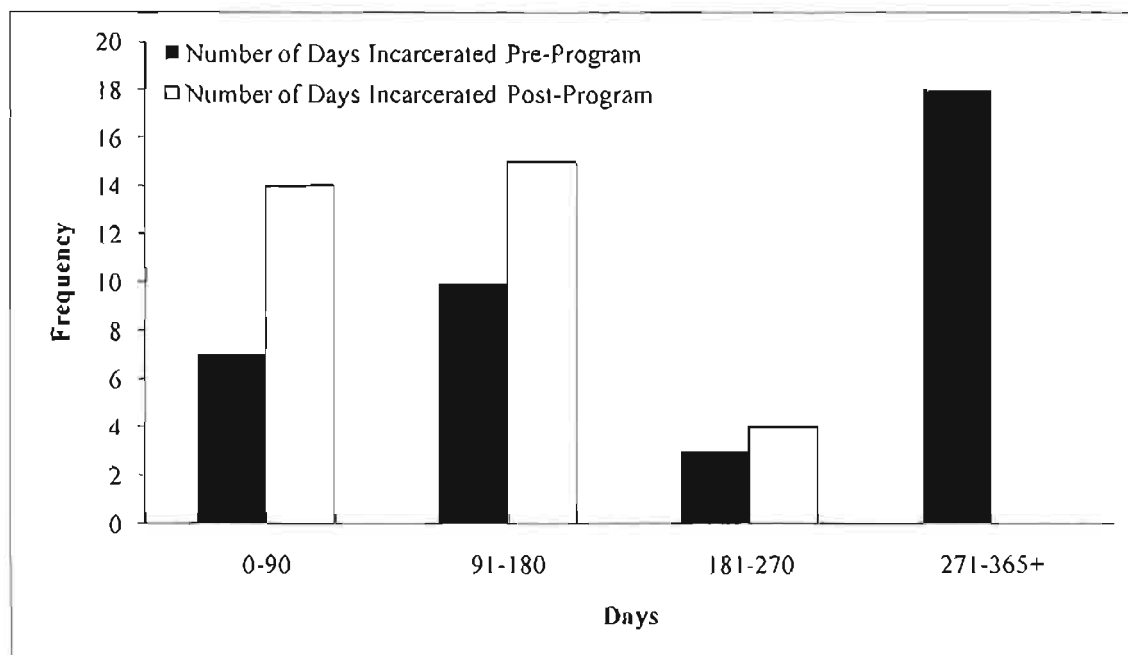
Forty offenders participated in the IPMP, of which N=38 were included in the final sample. Of the two individuals removed from data analysis, one did not have any COMS during-program data as she was effectively not involved in program activities due to multiple misconduct incidents resulting in segregation. The second individual was removed due to minimal (less than 50%) program participation. Five offenders were released from the MNDOC before their program completion date; their data was still included in pre-program and during program analysis due to having received over 50% program participation during these time periods.

### **Days Incarcerated Pre and Post-Program Implementation**

The frequency of number of days incarcerated pre and post program implementation was calculated for all offenders. Most offenders were incarcerated for 270 to 365 plus days pre-program implementation (N = 18). Post-program implementation, most offenders were incarcerated for 90-180 days (See Figure 1). For this research, data was retrieved from COMS 245 days after the completion of the first IPMP implementation in January, 2009. Thus, no offenders are represented in Figure 1 as incarcerated more than 245 days.



Figure 1. Number of Days Incarcerated Pre and Post-Program Implementation



NOTE: Data was retrieved from COMS 245 days after the completion of the first IPMP implementation in January, 2009. Thus, no offenders are represented as incarcerated more than 181-270 days.

### Medical Visits

The average number of medical visits per month across participants during the pre-program implementation ( $M = 1.16$ ,  $SD = .64$ ), program implementation ( $M = .97$ ,  $SD = .76$ ) and post-program implementation ( $M = .63$ ,  $SD = .69$ ) are given in Table 1.

A one-way repeated measure analysis of variance determined that there was a significant difference between the average number of medical visits pre-, during, and post-program implementation  $F(2, 64) = 7.11$ ,  $p < .01$ . A paired samples t-test revealed that offenders had significantly less medical visits after IPMP completion than before program implementation  $t(32) = 3.82$ ,  $p < .01$  (see Table 2). Tests revealed a Cohen's  $d$  unpooled effect size of  $d = .83$  and a pooled effect size of  $d = .80$ .

Table 1

*Average Frequency of Medical Visits per Month over Time*

	Mean	Standard Deviation
Pre-program implementation	1.16	.64
During-program Implementation	.97	.76
Post-program Implementation	.63	.69

Table 2

*T-test Results Comparing Average Frequency of Medical Visits over Time*

	<i>t</i>	Sig.
Pre-program to during program	1.42	.165
During program to post-program	1.60	.119
Pre-program to post-program	3.82	.001

**Nursing Visits**

The average number of nursing visits per month across participants during the pre-program implementation ( $M = 1.54$ ,  $SD = .76$ ), program implementation ( $M = .99$ ,  $SD = .97$ ) and post-program implementation ( $M = .63$ ,  $SD = .58$ ) are given in Table 3.

A one-way repeated measure analysis of variance was significant between the average frequency of nursing visits pre-, during, and post-program implementation  $F(2, 64) = 14.36$ ,  $p < .001$ . A paired samples t-test revealed that offenders had significantly less nursing visits after IPMP completion than before program implementation  $t(32) = 5.36$ ,  $p < .001$  (see Table 4).

Tests revealed a Cohen's  $d$  unpooled effect size of  $d = 1.20$  and a pooled effect size of  $d = 1.36$ .

Table 3

Average Frequency of Nursing Visits per Month over Time		
	Mean	Standard Deviation
Pre-program implementation	1.54	.76
During-program Implementation	.99	.97
Post-program Implementation	.62	.58

Table 4

<i>T-test Results Comparing Average Frequency of Nursing Visits over Time</i>		
	<i>t</i>	Sig.
Pre-program to during-program	3.72	.001
During-program to post-program	1.69	.101
Pre-program to post-program	5.36	.000

### Mental Health Visits

The average number of mental health visits per month across participants during the pre-program implementation ( $M = 2.55$ ,  $SD = 2.72$ ), program implementation ( $M = 10.50$ ,  $SD = 3.42$ ) and post-program implementation ( $M = .97$ ,  $SD = 1.38$ ) are given in Table 5.

A one-way repeated measure analysis of variance determined that there is a significant difference between the frequency of mental health visits pre-, during, and post-program implementation  $F(2, 64) = 126.75$ ,  $p < .001$ . A paired samples t-test revealed that offenders had significantly less mental health visits after IPMP completion than before program implementation  $t(32) = 2.76$ ,  $p < .05$  (see Table 6).

Tests revealed a Cohen's  $d$  unpooled effect size of  $d = .58$  and a pooled effect size of  $d = .67$ .

Table 5

<i>Average Frequency of Mental Health Visits per Month over Time</i>		
	Mean	Standard Deviation
Pre-program implementation	2.55	2.72
During-program Implementation	10.50	3.42
Post-program Implementation	.97	1.38

Table 6

<i>T-test Results Comparing Average Frequency of Mental Health Visits over Time</i>		
	$t$	Sig.
Pre-program to during-program	-11.46	.000
During-program to post-program	15.93	.000
Pre-program to post-program	2.76	.01

### **Misconduct Incidents**

The average number of misconduct incidents per month during the pre-program implementation ( $M = .07$ ,  $SD = .10$ ), program implementation ( $M = .08$ ,  $SD = .17$ ) and post-program implementation ( $M = .06$ ,  $SD = .17$ ) are given in Table 7.

A one-way repeated measure analysis of variance determined that there is no significant difference between the frequency of misconduct incidents pre-, during, and post-program implementation  $F(2, 74) = .12$ ,  $p = .89$ .

Table 7

*Average Frequency of Misconduct Incidents per Month over Time*

	Mean	Standard Deviation
Pre-program implementation	.07	.10
During-program Implementation	.08	.17
Post-program Implementation	.06	.17

**Health Care Utilization Costs**

As stated in chapter 3, the total cost savings of the IPMP were estimated using two methods. The MN DOC Cost/Individual will be estimated by taking the approximate cost of one medical, nursing, or mental health visit at the MN DOC and determining the amount of money saved based on the reduction in use for each of the three categories. The State Cost/ Individual will be calculated as a percentage of the average cost to provide health care services to one offender for one year (\$1950). This estimated cost will be a percentage of \$1950, based on the decrease in health care usage pre-program implementation to post-program implementation. Results of all cost reduction calculations are listed in Table 8.

**Estimate of Medical Savings***MN DOC Cost/Individual*

The estimated cost of one medical visit at the MN DOC is approximately \$100 dollars (D.Latuseck, personal communication, May 5<sup>th</sup>, 2010). As stated above, the IPMP reduced the average number of medical visits per offender by approximately 6 (N = 6.36) visits per year. Therefore, the program is effectively reducing medical costs to the MN DOC by \$636 dollars per

year for each offender. Further, the program reduced medical costs by \$24,168 dollars per year for all 38 offenders who participated in the program.

#### *State Cost/Individual*

As stated above, it is estimated that state prison systems spend \$1,950 per offender in health care costs each year (Sourcebook for Criminal Justice Statistics, 1997). Because the program reduced the average number of medical visits pre-program implementation to post-program implementation by 45.7%, it is estimated that the IPMP reduced the cost by \$891.15 dollars per year for each individual and by \$33,864 for all 38 offenders who participated in the program (see Table 8).

### **Estimate of Nursing Savings**

#### *MN DOC Cost/Individual*

The estimated cost of one nursing visit at the MN DOC is approximately \$100 dollars (D.Latuseck, personal communication, May 5<sup>th</sup>, 2010). As stated above, the IPMP reduced the average number of nursing visits per offender by approximately 11 (N = 11.04) visits per year. Therefore, the program is effectively reducing nursing costs to the MN DOC by \$1,104 dollars per year for each offender. Further, the program reduced nursing costs by \$41,952 dollars per year for all 38 offenders who participated in the program.

#### *State Cost/Individual*

As stated above, it is estimated that state prison systems spend \$1,950 per offender in health care costs each year (Sourcebook for Criminal Justice Statistics, 1997). Because the program reduced the average number of nursing visits pre-program implementation to post-program implementation by 59.7%, it is estimated that the IPMP reduced the cost by \$1,152

dollars per year for each individual and by \$44,232 for all 38 offenders who participated in the program (see Table 8).

### **Estimate of Mental Health Savings**

#### *MN DOC Cost/Individual*

The estimated cost of one mental health visit at the MN DOC is approximately \$50 dollars (D.Latuseck, personal communication, May 5<sup>th</sup>, 2010). As stated above, the IPMP reduced the average number of mental health visits per offender by approximately 19 (N = 18.96) visits per year. Therefore, the program is effectively reducing mental health costs to the MN DOC by \$948.00 dollars per year for each offender. Further, the program reduced mental health costs by \$36,024 dollars per year for all 38 offenders who participated in the program.

#### *State Cost/Individual*

As stated above, it is estimated that state prison systems spend \$1,950 per offender in health care costs each year (Sourcebook for Criminal Justice Statistics, 1997). Because the program reduced the average number of mental health visits pre-program implementation to post-program implementation by 62.0%, it is estimated that the IPMP reduced the cost by \$1,208 dollars per year for each individual and by \$45,942 for all 38 offenders who participated in the program.

Table 8

*Estimates of Cost Savings per Individual as a Result of Participation in the IPMP for One Year*

Type of Visit	Avg. Number of Visits per Month Pre Program	Avg. Number of Visits per Month Post Program	% Reduction	State Cost/Ind.	MN DOC Cost/Ind.
Medical	1.16	.63	45.7%	\$891	\$636
Nursing	1.54	.62	59.7%	\$1152	\$1,104
Mental Health	2.55	.97	62.0%	\$1208	\$948
Total Savings				\$3251	\$2688



## **Chapter V: Discussion**

The IPMP was developed at the MN DOC in Shakopee, Minnesota to help offenders better understand and manage their chronic pain symptoms. The purpose of this research was to evaluate the IPMP at the MN DOC for its effectiveness in reducing medical, nursing, and mental health visits, as well as incidents of misconduct among offenders. The results of this study will be used formatively by the existing IPMP program in Shakopee, Minnesota. They will also be used to support the development and implementation of future pain management programs at other MN DOC sites. This chapter will discuss the results of this study and their implications for program development and replication. Limitations of the study and needs for future research will also be discussed.

### **Medical Visits**

The average number of medical visits significantly decreased in frequency from before program start to program completion. The resulting effect size indicates the amount of change was large. Specifically, there was a 45.7% decrease in the average number of medical visits after program completion. Before starting the program, the average offender had a medical visit approximately 14 ( $N = 13.92$ ) times per year. After completing the program the average number of medical visits was cut in half, at approximately 7 ( $N = 7.56$ ) per year. The program reduced the average number of medical visits per year for each offender by approximately 6 ( $N = 6.36$ ) visits. With 38 offenders participating in the IPMP, the program reduced the total number of medical visits for all participants by approximately 241 ( $N = 241.68$ ) visits per year.

These findings support the program's effectiveness in reducing physician visit treatment seeking among the program participants after program completion. It is not known specifically what caused this change. It is possible that the participants had less need or desire for medical visits due to the general attention they received while in treatment. It is also possible that the

program led to better pain management; participants learned how to control their chronic pain symptoms, which led to less pain, which in turn led to less need for medical visits. Succinctly stated, the program taught them how to manage their pain, so they didn't need to seek medical care. Although no information is directly available on severity of chronic pain symptoms, it is reasonable to assume that the decrease in treatment seeking is due to a decrease in pain symptoms and experience.

These findings are consistent with other chronic pain management program research that indicates patients who receive cognitive behavioral therapy treatment for chronic pain (as opposed to patients who receive only medical or psychologically-based treatment) have less health care utilization, a result which continues up to months post-treatment (Cipher, Fernandez, & Clifford, 2001). It should be noted that this research does not indicate if health care utilization constitutes medical or nursing visits, but it can be reasonably assumed it included both.

### **Nursing Visits**

The number of nursing visits significantly decreased in frequency prior to program start to program completion. The resulting effect size indicates the amount of change was large. There was a 59.7% decrease in the average number of nursing visits after program completion. Before starting the program the average offender had a nursing visit approximately 18 (N = 18.48) times per year. After completing the program the average number of nursing visits was reduced to approximately 7 (N = 7.44) times per year. The program reduced the average number of medical visits per year for each offender by approximately 11 (N = 11.04) visits. With 38 offenders participating in the IPMP, the program reduced the total number of nursing visits by approximately 419 (N = 419.52) visits per year.

These results again are consistent with prior research that shows biopsychosocial treatment modalities effectively reduce health care utilization among chronic pain patients. They also further support the indication that the program may be reducing symptoms of chronic pain in the offender population resulting in less need or desire for nursing visits.

Overall, the frequencies of nursing visits are higher than medical visits pre, during, and post-program implementation. This is likely due to the fact that routine health care visits (such as mantoux screenings and initial assessments before incarceration) are classified as nursing visits in the COMS database system. It is expected that nursing visits will be higher than medical visits as many visits of this type are required.

### **Mental Health Visits**

The number of mental health visits significantly decreased in frequency prior to program start to program completion. The resulting effect size indicates the amount of change was large. There was a 62.0% decrease in the average number of mental health visits after program completion. Before starting the program the average offender had a mental health visit approximately 31 ( $N = 30.6$ ) times per year. After completing the program the average number of mental health visits was reduced to approximately 12 ( $N = 11.64$ ) times per year. The program reduced the average number of mental health visits per year for each offender by approximately 19 ( $N = 18.96$ ) visits. With 38 offenders participating in the IPMP, the program reduced the total number of mental health visits by approximately 720 ( $N = 720.48$ ) visits per year.

The reduction in mental health visits also supports the suggestion that the IPMP is effectively reducing chronic pain symptoms among program participants. This reduction in mental health treatment seeking is also consistent with previous research examining cognitive

behavioral chronic pain treatment programs. Specifically, this research found improved mental health functioning, increased adjustment to pain, and effectively altered mood (Eccleston et al., 2009) in chronic pain participants post cognitive behavioral therapy treatment. Research also found cognitive behavior treatment programs demonstrated increased ability to self-manage chronic pain symptoms, reduced psychological strain and disability, and improved quality of life (Scascighini et al., 2008). It is very possible the participants of the IPMP are experiencing the same positive effects of psychologically-based treatment, resulting in less need or desire for mental health programming.

It should be noted that the mean number of mental health visits significantly increased during program implementation. This increase is an artificial inflation directly due to the IPMP. Specifically, all individual and group treatment sessions that are a requirement of the IPMP are classified as mental health visits in the COMS database. It is therefore expected that the mental health visits will be substantially higher (e.g. daily) while offenders are actively participating in the program.

### **Misconduct Incidents**

There were no significant differences between misconduct incidents pre, during, or post-program implementation. There are multiple hypotheses as why no difference was found. First, the incidence of misconduct is a very rare occurrence among female offenders at the MN DOC. It was unlikely that a statistically significant difference would be found based on an already rare occurrence in the general prison population.

Second, misconduct behavior is theoretically less directly related to chronic pain than medical or mental health treatment seeking behavior. Research indicates most people with chronic pain will have high levels of mental health and health care utilization (Cipher et al.,

2001). Most people with chronic pain are hurting, by definition, and therefore seek treatment. If an offender were to seek treatment for their chronic pain we would expect their health care utilization to decrease due to less need for health care services. If, however, an offender were to seek treatment for their chronic pain and not receive pain alleviation, he/she may become agitated and as a result, possibly act out.

It is well known that chronic pain sufferers have higher levels of irritability, (Thorn & Boothby, 2002) and if an offender is frustrated due to lack of treatment, they may act out, display aggression, and engage in misbehavior. However, because misconduct behavior is not directly related to chronic pain symptoms, as is health care utilization, it would be more difficult to find a link between these two variables because an offender would first have to experience chronic pain, receive inadequate treatment and become irritable, and then display misconduct behavior.

### **Health Care Utilization Costs**

It is estimated that Americans spend over 70 billion dollars annually to treat chronic pain, (Bailey et al., 2003) an amount that could be significantly reduced by implementing cognitive behavioral treatment programs as the primary chronic pain treatment modality in the correctional system. Not only do patients who participate in these programs spend three times less on health care expenditures than other patients, but they also experience less chronic pain symptoms and increases in emotional functioning (Cipher et al., 2001).

The results of this research indicate the MN DOC is significantly reducing the number of health care utilization visits for offenders due to participation in the IPMP. As discussed in chapter 4, this decrease is saving the MN DOC an estimated total of \$2,688 to \$3,251 dollars for each participant in the IPMP per year. Although these cost savings were calculated using two

different methods, their similarity provides support for accuracy and indicates actual cost savings are likely to be within this range.

### **Projected Savings for the MN DOC**

In total, the MN DOC is saving approximately \$102,144 to \$124,032 per year for all 38 offenders participating in the MN DOC. As indicated in chapter 2, it is estimated that at a minimum, there are  $N = 1,038$  offenders within the MN DOC who suffer from chronic pain. If all of these offenders participated in IPMP-like programming, using the MNDOC Cost/Individual estimate, there would be a projected total gross savings of \$2,790,144 per year for the MN DOC. Using the State Cost/Individual estimate, there would be a projected total gross savings of \$3,388,032 per year for the MN DOC.

### **Limitations**

This research is limited in that it is unknown why the offenders are using health care services less. It is not known whether the treatment programming is impacting the outcome. No information on program process variables were gathered in this study. It is also not known how the program has affected the offender's pain levels and other health-related variables such as depression and anxiety.

This research may also be limited in that the pre to post frequencies of health care visits could be slightly inflated due to 24 of the offenders having been incarcerated less than a year before program implementation. These results may be inflated as a result of the offenders receiving attention, and the results may have nothing to do with the treatment itself. Long term offenders would be less likely to be affected by attention alone due to previous interaction with staff or participation in other programming at the MN DOC.

Another limitation of this study is that the implementation cost of the IPMP is unknown, thus this research was only able to estimate the gross savings of the program. Further research needs to examine the net savings for the IPMP based on how much it costs to implement the program.

## **Conclusions**

- The results of this research indicate that the IPMP is effectively reducing health care utilization at the MN DOC.
- The results of this research indicate no significant difference in reduction of misconduct incidents pre-program implementation to post-program implementation.
- No objective data was gathered regarding why or how the IPMP resulted in decreased health utilization. It is assumed they are due to increased ability to self-manage and control pain experiences. Previous research examining cognitive behavioral treatment programs demonstrated participants developed the ability to self-manage and control their chronic pain (Scascighini et al., 2008). Individuals also had reduced psychological strain and disability, and improved quality of life (Scascighini et al., 2008). It is likely that offenders who participated in the IPMP have experienced similar outcomes.
- The IPMP is significantly reducing the amount of money spent on health care at the MN DOC. The MN DOC is saving approximately \$102,144 to \$124,032 per year for all 38 offenders participating in the MN DOC.
- It is estimated that there are 1,038 offenders within the MN DOC system that are currently suffering from chronic pain. It is projected that wider program

implementation across MN DOC sites would result in substantial health care spending savings for the MN DOC (approximately \$2,790,144 to \$3,388,032 dollars).

### **Recommendations**

Future research should focus on identifying the strengths and weaknesses of the IPMP. Specifically, attention should be given to identifying the important process variables leading to program effectiveness. This research would determine which specific IPMP program processes are critical to success. It is these processes that should be included in the development of replicated pain management programs at other MN DOC facilities.

Increased attention should also be given to collecting direct measurements of the incidence of chronic pain, and experience of chronic pain, within the offender population. This information could be used to ascertain more definitely the extent and severity of chronic pain within the offender population, and thus the need for chronic pain treatment programs.

Information on the mental health and quality of life (QOL) benefits of chronic pain treatment in offender populations is needed. This information, compared to the health utilization findings from the present study, would provide more proximal indicators of chronic pain treatment effectiveness within offender populations. Specifically, the effectiveness of the IPMP in reducing depression, anxiety, QOL, and perception of pain among offenders pre, during, and post-program implementation should be determined. Suggested constructs and measures include the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Minnesota Multiphasic Personality Inventory-II (MMPI-II), and standardized pain rating scales.

Research should also examine health-care utilization levels of offenders with untreated chronic pain. It would be interesting to compare this level to that of offenders without chronic pain. Doing so would determine if the program is merely bringing the chronic pain participants



down to the average number of medical, nursing, and mental health visits within the general offender population or if the IPMP actually decreases health care utilization to below that of the offender population in general.

Finally, all the above indicated further research should be done after removal or reclassification of the required health care visits, which are classified as nursing visits, in the COMS database. This will remove a possible confounding variable that may artificially inflate the number of nursing visits pre-program implementation. Removing these perfunctory visits would provide a more accurate representation of the number of offender-perceived medically necessary nursing visits.

Collectively, by doing the above research, the MN DOC would have a better idea of the actual prevalence of chronic pain in the offender population. This research would also provide insight into the levels of pain severity and QOL in chronic pain sufferers. Finally, this research would indicate which program processes are essential to program effectiveness. It is strongly recommended that the results of this research be published and disseminated, both locally and nationally. Doing so would promote and further strengthen the national reputation of the IPMP and the MN DOC.

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