THE THEORY OF PLANNED BEHAVIOR AND ADHERENCE TO A

MULTIDISCIPLINARY TREATMENT PROGRAM

FOR CHRONIC PAIN

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The primary objective of this study was to examine the association between the theory of planned behavior (TBP) and adherence to a multidisciplinary pain center (MPC) treatment program for chronic pain. While the results of several studies have provided support for the efficacy of MPC treatment in chronic pain, the problems of adherence and attrition are important. TPB is a cognitive/social model of behavior that has been used to predict a variety of behaviors, although it has never been used to predict adherence to a multidisciplinary chronic pain treatment program. It was predicted that Adherence would be predicted by Intentions and that Intentions would be predicted by 1) Perceived Social Norms, 2) Perceived Behavioral Control, 3) Attitudes Toward New Behavior (completing the treatment program), and 4) Attitude Toward Current Behavior (maintaining current treatment and coping strategies). It was found that the total Intentions scores did not predict the total Adherence scores. However, Intentions was predicted by 1) Perceived Behavioral Control, 2) Attitudes Toward New Behavior (completing the treatment program), and 3) Attitude Toward Current Behavior (maintaining current treatment and coping strategies). The finding that Perceived Social Norms did not predict Intentions was consistent with results of previous studies with the TBP. The secondary objective was to examine the extent to which MPC treatment affects patients' attitudes towards behaviors that are associated with successful pain management. The majority of the patients (82%) developed a more favorable attitude toward the program and their average report of the importance of the program was 6.78 on a 10-point scale. The majority of patients (74%) reported experiencing a greater decrease in pain than expected, and the average amount of pain decrease was 5.39 on a 10-point scale.

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CHAPTER 1

INTRODUCTION

The primary purpose of this study was to identify social / cognitive factors associated with adherence to a multidisciplinary pain clinic (MPC) treatment program. Adherence is an important issue in the treatment of pain at MPCs (Barnes, Smith, Gatchel, and Mayer, 1989; Carosella, Lackner, and Feuerstein, 1994; Hazard, Fenwick, and Kalisch, 1989). While studies have found improvements in several outcome measures following successful completion of an MPC program (Turk and Okifuji, 1998), the problem of attrition remains. There are surprisingly few studies that have examined the utility of health behavior models, such as the health belief model, theory of planned behavior, and self-efficacy theory, in predicting adherence to MPC treatment. However, there are a few interesting studies that have examined these models with regard to variables such as analgesic use, intentions to exercise, exercise behavior, self-care behavior, and disability due to chronic pain (Pellino, 1997; Doyle-Baker; 2001; Trafimow and Trafimow, 1998; Arnstien, 2000; Gustafsson, Gaston-Johansson, and Aschenbrenner, 1999; Hammond, Lincoln and Sutcliffe, 1999). The health behavior model that was utilized in this study is an extension of the theory of planned behavior by Maddux and DuCharme (1997).

Social / cognitive variables as predictors and correlates of treatment adherence are important to examine as these variables not only have been strongly implicated in chronic pain but are also factors that are important in guiding the content of psychosocial interventions developed by psychologists and counselors who work with chronic pain patients.

A second purpose of the study was to examine the extent to which MPC treatment affects attitudes and beliefs about pain management and rehabilitation behaviors taught in MPC programs. While a number of studies have demonstrated an association between cognitive

factors and pain and disability (Turk and Okifuju, 1998; Weiser and Cedaraschi, 1992), relatively few studies have been conducted that evaluate the ability of MPC treatment to affect change in beliefs and attitudes about behaviors needed for successful management of chronic pain, such as regular stretching and exercise, and practice in stress management and coping techniques.

<div align="center">Important Aspects of the Study</div>

This study is based in social / cognitive models of health behavior. As such, this study is driven by psychological theory and subsequently is both theoretically and academically meaningful in that it evaluates the utility and validity of a theoretical model with a specific clinical population.

Using a clinical population, not only is the study theoretically meaningful, it has clinical applications and implications as well. Furthermore, the variables assessed are within the domain of psychologists' and therapists' practice. Thus, the results of the study can be particularly meaningful to these health care practitioners.

As more and more people are experiencing chronic pain problems, and because of the great economic impact of chronic pain and disability, this study is meaningful to the field of public health. Many clinicians and researchers do in fact conceptualize chronic pain as a public health issue.

This study is meaningful from a program evaluative perspective, as it provides a framework for assessing an existing model of chronic pain treatment.

Finally, in order to increase the generalizability of the results, data in this study were collected from a sample of different MPCs owned by the same proprietor. Given the commonalities among the thousands of MPCs in the United States (Turk and Okifuji, 1998), it is expected that the results of this study will generalize well to MPC treatment on the whole.

Chronic Pain: Treatment and Economic Impact

The second most common reason for seeking medical care is the experience of pain, accounting for 80 million visits to physicians per year. Researchers estimate that in the United States alone approximately 90 million individuals suffer from at least one pain syndrome (Marketdata-Enterprises, 1995). The treatment of chronic pain is a costly health issue in our country. Over $125 billion per year is expended to treat chronic pain patients (Turk and Okifuji, 1998). Furthermore, some have suggested that health care costs comprise only 1/3 of the total chronic pain expenditures (Frymoyer and Durett, 1997). Other costs include legal costs, lost productivity, disability payments and loss of tax revenue. Subsequently, the total cost of chronic pain could be $375 billion per year. Chronic low back pain, one of the most common and costly sites of chronic pain (Gatchel, Polatin, and Mayer, 1995; Bacon, et al., 1994; Turk and Okifuki, 1998), is the third most common reason for surgery in the United States and the Fifth most common reason for hospitalization. In 1990, over 279,000 surgeries were performed for back pain in the United States (Taylor, Deyo, Cherkin, Kreuter 1991). The average cost of lumbar surgery has been estimated at approximately $15,000 (Frymoyer and Durett, 1997).

The number of clinics specializing in the treatment of pain increased from 327 in 1977 to approximately 1,000 in 1990. One special type of clinic is the multidisciplinary pain clinic (MPC), which employs health professionals from a number of different disciplines, such as medicine, psychology, physical therapy, etc. Although there is variability between MPCs with regard to disciplines of treatment providers, therapeutic modalities, and models of treatment, all MPCs share the following commonalities (Turk and Okifuji, 1998): 1) the belief that pain is multidimensional in nature, 2) the belief that a multidisciplinary approach is the most effective approach to treating pain, 3) goals are rehabilitative versus curative, 3) patient education is

important in helping the patient become self reliant in their pain management, and 4) attention to behavioral and cognitive factors in pain. The development of MPCs and their subsequent increase in numbers resulted in part from the inadequacy of traditional medicine to manage chronic pain, despite profound advances in technology. In fact, there is no medical or surgical technique that permanently and consistently improves pain for all patients (Turk and Okifuji, 1998).

The average cost of treatment per patient, excluding surgical procedures, prior to beginning treatment at a multidisciplinary pain clinic has been reported to be approximately $13,284, with a range of $500 to $35,400 (Simmons, Avant, Demski, and Parisher, 1988). This includes, for example, physical therapy, medications, and other medical and rehabilitative interventions. If one were to correct these figures for health care cost inflation, the average cost of treatment would be over $22,500 (Frymoyer and Durett, 1997).

Much research has been conducted on the effectiveness of multidisciplinary treatment of pain. In fact, more outcome studies have been conducted on the effectiveness of MPCs than any surgical or medical treatment (Turk and Okifuji, 1998). Research has demonstrated that MPC treatment results in a decrease in pain and emotional distress (Flor, Fydrich, and Turk, 1992), as well as a decrease in health care utilization (Caudill et al, 1991; Okifuji, Turk, Kalauokalani, 1999). Studies have also shown that MPC treatment results in closure of disability claims (Fey, Williamson-Kirkland, and Frangrove, 1987) and return to work (Okifuji, Turk, and Kalauokalani, 1999). Approximately 67% of MPC-treated patients return to work, whereas only 24% of conventionally treated patients and 43% of surgically treated patients return to work. Furthermore, MPC treatment is the least expensive of the three interventions, as cost of surgery is estimated at $15,000, cost of conservative treatment is estimated at $26,000, and cost of MPC

is estimated at only $8,100 (Okifuji, Turk, and Kalauokalani, 1999). However, despite these encourage findings, the problem of attrition from the program and lack of adherence remains. It is this topic to which we will now turn our attention.

<div align="center">Adherence to MPC Treatment</div>

As stated earlier, adherence to an MPC program is an important issue (Barnes, Smith, Gatchel, and Mayer, 1989; Carosella, Lackner, and Feuerstein, 1994; Hazard, Fenwick, and Kalisch, 1989). A number of factors have been related to poor adherence/early discharge from multidisciplinary work rehabilitation programs, such as duration of disability/length of time since injury (Milhous et al., 1989; Vallfors 1985; Gallagher, et al. 1989; Carosella, Lackner, and Feuerstein, 1994), job satisfaction/perceptions of the work environment (Cats-Baril and Frymoyer 1991; Feuerstein and Thebarge, 1991; Linton, 1991), and higher perceived pain and disability levels (Carosella, Lackner, and Feuerstein, 1994; Barnes, Smith, Gatchel and Mayer, 1989; Feuerstein and Thebarge, 1991; Hazard, Fenwick, and Kalisch, 1989). Furthermore, if we expand the notion of adherence to include successful completion of the treatment program, compensation status and litigation also become significant factors (Rohling, Binder, Langhinrichsen-Rohling, 1995; Gatchel, Polatin, and Mayer, 1995).

Carosella, Lackner, and Feurerstein (1994) investigated factors associated with early discharge from a MPC, including the ones mentioned above, and found that age, length of disability, lower return to work expectations, higher levels of perceived disability and pain, and focus on bodily sensations explained 34% of the variance in lack of adherence and correctly classified 71% of patients. However, these authors and others (Hazard, Bendix, and Fendwick, 1991) caution against attempts to screen patients for inclusion in this type of program based on the factors that are predictive of completion. Instead, they suggest integrating and emphasizing

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several cognitive and behavioral components into the treatment program that will decrease the patients' feelings of helplessness and disability, and increase feelings of competence.

The number and type of cognitive variables examined in the above studies has been limited to the patients' self report of pain and disability, and in some studies, job satisfaction. Adherence has not been assessed with regard to cognitive and social variables concerning the specific types of treatments often used in MPCs, specifically with regard to perceived benefits and costs of engaging in the treatments. As many cognitive and social theories of behavior assert, if we wish to predict specific behaviors, such as those involved in MPC treatment of pain, we need to look at cognitive and social factors associated with those specific behaviors.

Furthermore, studies that have examined cognitive variables, with regard to adherence or a variety of outcome measures, have not often used cognitive theories/models as a framework to guide their study and hypotheses. This study utilized an extension of a well-established cognitive/social model of behavior, the theory of planned behavior, to guide the investigation.

Social/Cognitive Variables and Pain

From the point of view of psychological intervention, it is important to look at those social/cognitive variables that can be changed in therapy that affect the results of the pain management program. As stated in Grzesiak and Perrine, "Any patient suffering from a painful illness, injury, or disability brings to that situation his or her own personality, coping skills and cognitive style" (p. 47). Social/Cognitive factors consistently have been shown to play a very important role in the development of disability due to low back pain. One's beliefs about pain and illness are the prominent contributors of overall incapacity (Grzesiak and Perrine, 1987). Specifically, research has shown that cognitive factors such as passive coping strategies, catastrophizing, hope and expectations, and perceived control and self-efficacy are all associated

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with low back pain or disability due to low back pain (Elkayam, et al., 1996; Bacon, et al., 1994; Hadjistavropoulos and Craig, 1994; Weiser and Cedaraschi, 1992).

Examining variables that can be influenced by psychological interventions, such as the above social/cognitive factors, may have more utility than examining only patient characteristics / demographics and injury / job related variables. How a person defines his pain, what he believes about his ability to cope with pain, his beliefs about his future in relation to pain, and how he attempts to manage his pain are all formulative processes the individual engages in that comprise his construction of his experience.   All of these can be discussed in therapy to influence positive outcomes.

Static/descriptive variables such patient characteristics / demographics and injury / job related factors, while they may sometimes be predictive and direct future research, do not often lend us information that can be used to help the patient. For example, length of time in pain/since the injury has been associated with poor outcome (Carosella, Lackner, and Feuerstein, 1994; Milhous et al. 1989; Vallfors, 1985; Gallagher et al. 1989). This association reveals little about those psychosocial/cognitive factors that influence a favorable outcome, such as returning to work, decreased health care utilization, lower pain level, and better quality of life. Additionally, several studies have shown that CLBP patients often have elevated scores on the MMPI subscales of Hypochondria (HY), Depression (D), and Hysteria (HS) (Gatchel, et al., 1996; Grzesiak and Perrine, 1987; Sivik,1991). Another study (Elkayam, et al., 1996) found that personality disorders, particularly histrionic, borderline, and schizoid personalities, were related with poor treatment outcome, whereas anxiety disorder and "overall good functioning" were related to satisfactory outcome. However, again, these studies with their emphasis on the identification personality "types" characterized by general descriptors and polythetic criteria for

diagnosis reveal little about processes and changes in specific cognitive/social processes that promote a positive outcome or contribute to a poor outcome.

An important question related to the above issues is the extent to which demographic characteristics ("static" variables) are associated with specific cognitive processes and variables. If these two variables, demographic characteristics and cognitive characteristics, are significantly related, treating them as separate in a statistical analysis would be methodically inappropriate, confound the results and lead to inaccurate interpretations of the data.

Stroud, Thorn, Jensen, and Boothby (2000) found that pain beliefs and cognitions accounted for a significant amount of variance in general activity, pain interference, and affective distress after controlling for demographics, employment status, and pain intensity, suggesting that cognitive variables are independent of demographic and descriptive variables. However, the authors did not state explicitly which demographic variables were investigated. Also, Young (1996) examined three different classes of predictors of lumbosacral surgery outcome – physical, sociodemographic, and psychological predictors such as health beliefs, and stressed the importance of the psychological predictors in outcome. Finally, Aikens, Michael, Levin, and Lowry (1999) found that patients' beliefs were strongly related to cardiac symptom intensity in emergency room patients with chest pain who later were found to have no identifiable pathology. These results were not related to demographics. Although, however, the researchers did not explicitly state the specific demographics they examined.

Results of various studies that have examined cultural differences in the perceptions of (or responses to) pain have been equivocal. For example, Gatchel and Weisberg (2000) found no evidence that demonstrates differences between ethnic groups on pain perception or response. However, Bates (1996) did in fact find differences between ethnic group on both pain and locus

of control. What is most interesting about Bates's findings, however, is that ethnic background continued to be associated with pain even after controlling for LOC. These results may be interpreted as suggesting that the relationship between demographic and cognitive variables is not strong enough to preclude their conceptualization and examination as two different factors influencing outcomes. Furthermore, Gatchel and Weisberg found that only age was related to pain variables. Specifically, older adults experienced less emotional disruption and lifestyle interference as a result of pain than did younger subjects.

With regard to the association between health beliefs and health behaviors unrelated to pain, researchers have found similar results. For example, Thomas, Fox, Leake, and Roetzheim, (1996) found that Race and ethnicity had no direct effects on mammography utilization nor was it a confounder in the relationship between health beliefs, concerns, and utilization.

Finally, the variable "neuroticism" has also been examined in chronic pain populations (Gatchel and Weisgberg, 2000). On the one hand, neuroticism could be considered a descriptive or demographic variable similar to those mentioned above such as schizoid or borderline personality disorder. On the other hand, as we will see it may also be considered a cognitive variable. Neuroticism has predicted back and neck pain, observable pain behavior, and has been considered a risk factor for medical problems. It has also been significantly related to disability (days missed from work), somatization, and pain severity in an outcome study (Gatchel and Weisgberg, 2000). Some researchers believe that it is in fact more closely related to emotional and behavioral consequences of pain rather than the perception of severity or immediate unpleasantness. The difficulty with the issue of neuroticism within this context of demographic and cognitive variables is that neuroticism is conceptualized largely in terms of cognitive style. That is, while some suggest that neuroticism reflects a tendency to experience chronic, negative

emotions, it also reflects a ruminative cognitive style, which is further characterized by negative self statements and catastrophizing. In sum, neuroticism is a label for a group of specific, associated cognitive characteristics, which gives further credence to the notion that cognitive factors are strongly associated with a number of dimensions of the pain experience.

Thus, the above studies suggest that cognitive variables are different from demographic variables. It is important to examine the social/cognitive variables that predict favorable outcome at the beginning of treatment as well as the influence of the change in these variables throughout the course of the intervention. This can help inform the nature of the counselors' and psychologists' interventions and provide focus areas for intervention. It is apparent from the review of the literature that the cognitive variables examined were most often related to general beliefs about pain and illness. As stated earlier, no studies have examined cognitive and social variables concerning the specific types of treatments often used in MPCs, specifically with regard to perceived benefits and costs of engaging in the treatments as well as the valuation of the perceived outcomes. This is very important because many theories of behavior assert that belief and attitudes about the specific behavior in question are in fact among the most important determinants of behavior. In sum, while it may be important to examine how beliefs about pain and illness influence behavior in general, if we wish to examine specific behaviors, it might be more important to look at cognitive factors associated with those specific behaviors.

Social / Cognitive Models of Health Behavior

A number of cognitive/social models have been developed to help understand and predict health-related behaviors. These include, for example, the health belief model, the theory of planned behavior, and self-efficacy theory. Generally speaking, cognitive theories emphasize the role of mental processes such as reasoning, hypothesizing, and expecting on behavior.

Specifically, cognitive theorists assert that behavior results from an individual evaluating the worth of a particular outcome and estimating the probability that a particular behavior will result in the outcome. Theories that include these notions of estimations of values and expectancies are known as value-expectancy theories (Stretcher, Champion, and Rosenstock, 1997).

Before beginning a brief review of cognitive health behavior models, there are three issues that should be noted regarding the utility of these models. First, as cognitive models, the models can be expected to explain at most only the amount of variance in health behaviors that is the result of attitudes and beliefs. There may be a number of other factors that may also influence health behaviors. This is a particularly important to remember when utilizing these models with a population of patients who are suffering from pain which is a result of injuries sustained at work. In this population, variables such as job satisfaction, litigation status, and workers compensation status have been associated with outcome (Cats-Baril and Frymoyer, 1991; Bigos, Battie, Spengler, Fisher, Fordyce, Hansson, Nachemson, and Wortley, 1990; Feuerstein, and Thebarge, 1991; Linton, 1991)

Measurement of the models' components is a second issue to consider. Indeed, a variety of different methods have been used to assess components of the models, and issues have arisen in the research speaking to the impact of operational definitions of the components as they relate to outcomes. The measurement issues will be discussed in more detail in the Methods section of the paper.

A third important issue to consider is overlap in definitions of the components of different models. Although the components of the models reviewed have different names, some authors argue that they are very similar in meaning. For example, the "attitudes" component of the theory of planned behavior (TPB) is similar to the "benefits" and "barriers" components of

the health belief model (HBM), as attitudes in the TPB are often measured by assessing both the expected outcomes and the evaluation of those outcomes. Furthermore, attitudes toward adopting a health behavior can be seen as similar to "susceptibility" and "severity" components of the HBM. There is also much similarity between "perceived behavioral control" from the TPB and self-efficacy, from Bandura's self-regulation theory.

An Integrated Model

Maddux and DuCharme (1997) have proposed an integrated model based largely on the theory of planned behavior, the health belief model, and self-efficacy theory. This model will serve as the general framework for the present study. After introducing this model, a brief review of the models from which it arose will be provided.

Maddux and DuCharme (1997) noted the similarity among models mentioned above and stated that the components of the health belief model are, for example, "similar or identical" to those of the theory of planned behavior (p.141). Furthermore, the researchers suggested that comparing the relative utility of each model would be less valuable than incorporating the major features of each model into a new model and then determining the importance of each of the features. Subsequently, they developed a new model containing the following components.

1) **Self efficacy for new behavior**. This is defined generally as the confidence that one has in successfully engaging in the specific behavior.

2) **Attitude Toward New Behavior**. This is determined by a) outcome expectancy for benefits and costs of *new* behavior and b) outcome value for benefits and costs of *new* behavior.

3) **Attitude Toward Current Behavior**. This is determined by a) outcome expectancy for benefits and costs of *current* behavior and b) outcome value for benefits and costs of *current* behavior.

4)   **Perceived Social Norms**. This is determined by a) outcome expectancy for support/approval and b) outcome value for support/approval.

All four components influence intention, which subsequently influences behavior. Self-efficacy directly influences both behavior and intention.

These similarities between the HBM and the TPB will become more evident in the methods section. As the above integrated model is heavily based on the theory of planned behavior and the health belief model a brief review of each of the models is warranted.   I will return to the integrated model later in the paper.

<div align="center">Health Belief Model</div>

The oldest and most widely researched model is the health belief model. The HBM is a value-expectancy theory that was developed in the 1950's by psychologists working in the Unites States Public Health Service. Generally speaking, with regard to health behaviors in particular, "value" translates as the desire to avoid illness or get well, and "expectation" translates as the belief that a particular behavior will prevent illness or improve wellness. The HBM has been widely researched and used to guide the development and evaluation of health behavior related interventions.

The specific components of the HBM include perceived benefits and perceived barriers, which are further delineations of the "value" concept, and perceived susceptibility and perceived severity, which are further delineations of the expectancy concept. Perceived susceptibility refers to a person's estimate of the risk of contracting a particular illness. Perceived severity refers to the individual's estimate of the seriousness of the clinical and social consequences of contracting a particular illness. Taken together, susceptibility and severity create an index of perceived threat.

While perceived threat may motivate one to engage in some type protective behavior, the specific course of action that the individual chooses among all of the perceived alternatives is determined in part by the individual's estimation of the effectiveness of the alternatives in reducing the threat. In the HBM, this is referred to as perceived benefits. The estimation of perceived negative aspects of a particular course of action that may impede successful execution of the behavior is referred to as perceived barriers. In sum, as Rosenstock (1974) succinctly stated, " The combined levels of susceptibility and severity provided the energy or force to act and the perception of benefits (less barriers) provided a preferred path of action" (p.332).

As stated earlier, the Health Belief Model is perhaps the most widely researched health behavior model. As such, much conceptual and empirical literature about the model has accumulated in the past 50 years. In fact, a quick search on PsycInfo using the term "health belief model" yields over 775 articles.

In a literature review spanning research conducted on the Health Belief Model between 1974 and 1984, Janz and Becker (1984) conclude that there is "substantial empirical support" for the Health Belief Model, and the authors suggest components of the model be included in the development of health education programs. The authors examined the utility of the HBM in predicting both preventive health behaviors (PHB) and sick role behaviors (SRB). For both PHB and SRB, perceived barriers seemed to be the most important factor as 91% of the studies reviewed found a significant association between perceived barriers and the dependent variable. Eighty-one percent of the studies found significant results with perceived benefits, 77% with perceived susceptibility and 59% with perceived severity.

It was found that susceptibility and benefits were equally important with regard to PHB. Additionally, it was found that severity did not seem to be a particularly important dimension

with PHB. The authors suggest that individuals may have a difficult time conceptualizing this dimension without actually experiencing the illness in question. It is also possible that most people find some disease either very serious or not serious, which limits variance in the measure and subsequently decreases the variable's ability to distinguish between compliers and non-compliers. Support for these hypotheses comes from the finding that perceived severity takes on a much more important role with regard to SRB. Furthermore, the susceptibility component does not seem to be as important in SRB. This may be due to difficulty operationalizing the construct when the illness is already present.

However, not all researchers consider support for the HBM to be adequate. Brannon and Feist assert that research on the utility of the model is inconsistent and suggests that one possible reason for this is the methods used to examine the model. Much of this research is wrought with measurement issues. Few researchers have attempted to validate their measures, there has been huge variability in operational definitions of the components of the model, and most researchers have neglected to build off of or expand previous research.

Aside from the research methods employed in HBM studies, the model itself may have some conceptual limitations.   For example, the HBM was originally developed to examine behaviors that were relatively easy for one to perform, such as immunizations or screening tests (Strecher, Champion, and Rosenstock, 2000). Thus, the notion of self-efficacy or perceived behavioral control was not likely to be an important contribution to the model. However, researchers began to notice the limitations of the model when examining more complex behaviors that may not completely be under one's volitional control, such as adherence to a specific exercise regime or diet. Researchers have found that the addition of self-efficacy

increases the explanatory power of the HBM (Rosenstock, Strecher, and Becker, 1988). Low

self-efficacy for a particular behavior is considered to be a perceived barrier.

The difficulties and shortcomings of the health belief model prompted the development

of alternative health behavior models. One such model is the theory of planned behavior.

<div align="center">Theory of Planned Behavior</div>

The theory of planned behavior (TPB) is an extension of the theory of reasoned action

(TRA), which asserts that the best predictor of behavior is intention. Intention is in turn

determined by attitude toward the behavior and social norms. An important assumption of the

TRA, which limits its utility and prompted the development of the TPB, is that the behavior to be

predicted is under the individual's volitional control (similar to the HBM). Subsequently, the

authors introduced an additional component, perceived behavioral control, in order to address

this issue. If a particular behavior is completely under the person's control, then intentions alone

should be adequate at predicting the behavior. However, if the behavior is not completely under

the person's control, then perceived behavioral control becomes a more important factor in the

prediction. Behavioral control and Bandura's notion of self-efficacy are similar in that they both

address beliefs one has about abilities and opportunities to perform a specific action. Perceived

behavioral control is comprised of the perceived likelihood of occurrence of a facilitating or

inhibiting factor and the perceived power of that factor to facilitate or inhibit the execution of the

behavior in question. Equation one is a computational representation of perceived behavioral

control.

$$PBC = \sum_{k=1}^{k=n} c_k \ x \ p_k \qquad\qquad (1)$$

In the above equation, c_k is the perceived likelihood of the occurrence of factor k, and p_k is the power of factor k to inhibit or facilitate the behavior. PBC represents perceived behavioral control, and n is the number of control factors.

Perceived behavioral control influences behavior directly, and indirectly through its influence on intention. Indeed, it could be argued that few behaviors are completely under volitional control, which may be particularly important with regard chronic pain patients, as an increase in pain, lack of endurance, or limited range of motion may prevent them from engaging in behaviors beneficial to their rehabilitation. Furthermore, the person's perception of the control the have over the behavior is the most important aspect of this component, versus objective control.

As stated earlier, according to the TPB, the best predictor of behavior is intention. Fishbein and Azjen originally defined intention as "the person's subjective probability that he will perform the behavior in question" (p. 1975). As specificity of measurement of intention increases, the ability of intention to predict behavior increases. Thus, Fishbein and Azjen suggest that intention be measured with regard to the action to be performed, the time at which it is performed, the context in which it is performed, and the target at which the behavior is directed.

Intention is in part determined by attitude toward the behavior, which is in turn based on the consequences the persons expects will result from the behavior and the benefits and costs, or importance, of those consequences. The consequences can be thought of the outcome expectancy, while the benefits and costs can be thought of as the value expectancy. Equation two is a computational representation of the attitude component.

$$A_B = \sum_{i=1}^{i=l} b_i \ x \ e_i \tag{2}$$

In this equation, b_i is the outcome expectancy for consequence i. That is, bi is the perceived likelihood of the occurrence of consequence i. The subjective evaluation of this consequence is represented by e_i. "A_B" is the attitude about behavior B, and l is the number of salient consequences.

Intention is also determined by perceived social norms. Perceived social norms is based on normative beliefs, which are estimations of the degree to which others will approve of or support the behavior, and motivation to comply with other's requests. So in sum, normative beliefs are outcome expectations about other people's attitudes, while motivation to comply is a value expectation referring to the importance the individual places on other's attitudes and expected reactions. Equation three is a computational representation of the social norms component.

$$SN = \sum_{j=1}^{j=m} nb_j \ x \ mc_j \tag{3}$$

In this equation, *SN* the subjective norm, *nb* is the person's belief that individual *j* would want the person to engage in the behavior, and *mc* is the person's motivation to comply with individual *j*'s wishes. The number of individuals that may influence the person's behavior is represented by m. A graphic representation of the theory of planned behavior is provided in Figure 1.

So, what has research demonstrated with regard to the theory of planned behavior's ability to predict behavior? Ajzen (1991) found that the combination of perceived behavioral

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control and intentions significantly predicted behavior in 9 studies reviewed. The average

multiple correlation was .51, with a range of .20 to .78. Ajzen also reviewed sixteen studies to

examine the extent to which intentions can be predicted by attitudes, social norms, and perceived

behavioral control. He found that a significant percentage of variance in intention was predicted

by the combination of the three components in all sixteen studies reviewed. The averaged

correlation was .71, with a range of .43 to .94.

In a more recent article, Armitage and Conner (2001) reviewed 185 studies on the TBP

and found that the model accounted for 27% of the variance in behavior 39% of the variance in

intention. Although these figures are not as impressive as those reported by Ajzen (1991), they

are nonetheless significant.

Measurement Issues

Adherence

Adherence, also referred to as compliance, has been defined as "the extent to which a

person's behavior (in terms of taking medications, following diets, or executing lifestyle

changes) coincides with medical or health advice" (p. 2-3, Haynes, Taylor, and Sackett, 1979).

A number of different strategies can be employed in the assessment of adherence (Dunbar-Jacob

and Sereika , 2001). Examples of these include self-report (such as questionnaires), self-

monitoring data, permanent products (such as pill counts), behavioral measurement/observation,

biochemical indicators, and clinical outcome/health status indicators. Problematic issues are

associated with each of these methods, and the reader is referred to Meichenbaum and Turk

(1987) and Dunbar-Jacob and Sereika (2001) for reviews. Generally speaking, however, "direct

measures of behavior are superior to indirect measures and therefore should be used whenever

possible" (p. 64, Poling, Methot, LeSage, 1995). Of the assessment alternatives listed above,

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behavioral observation is the most direct method. In many circumstances direct observation is impractical and sometimes simply not possible. However, in the context of a multidisciplinary pain clinic, where patients spend several hours per day in various forms of therapy with a number of different health care practitioners, observation of the patient's behavior can be an appropriate assessment strategy.

In observation and measurement of behavior, it is customary to quantify dimensions of behavior (Poling, Methot, LeSage, 1995). These include frequency, duration, intensity, accuracy, and sometimes choice (Poling, Methot, LeSage, 1995). Frequency refers to the number of times a behavior occurs. With regard to MPC treatment one could measure frequency of specific behaviors such as stretching, walking on a treadmill, attending educational groups, or attending counseling. Duration refers to the time that lapses from the beginning to the end of a behavior. Duration may refer to the time spent performing stretches, walking on a treadmill, etc.

There are a number of benefits inherent in the above measurement strategy. First, as stated above, this is a traditional strategy for measuring behavior which has been used in a number of behavioral studies (Poling, Methot, LeSage, 1995; Johnston and Pennypacker, 1993). Second, assessment of adherence among multiple dimensions is commensurate with recent conceptualizations of adherence, which emphasize the importance of a multidimensional approach (Johnston and Pennypacker, 1993). Third, this approach closely approximates Azjen's guidelines for defining and measuring intention and behavior in his model, as he stresses the importance of explicitly stating the behavioral dimensions of action, target, context, and time. Fourth, measuring adherence based on explicitly defined, relatively objective dimensions will likely decrease the likelihood of observer drift and other factors that might bias the observer. Fifth, the treatment protocol provides standards for these dimensions, which will allow for

observers estimations to be more meaningful and accurate as the standard for the dimension will be operationally defined. Finally, perhaps one of the most important reasons to measure behavior on these dimensions is that successful completion of the program depends on patients' performance on each of these dimensions. That is, the patients will gain more benefit from the program if they engage in the treatments at the intended duration, frequency, accuracy, and time.

There are potential limitations to this approach, however. The main limitation to the specific approach that will be used in this study is that it will rely on the staff member's estimation of the duration, accuracy, etc. of the behavior in question, versus a more objective measurement of the behavioral dimension. For example, the staff member will not be required to use a stopwatch to measure and record the duration each patient's behavior. Such intensive measurement by clinical staff is impractical in an applied clinical setting.

Theory of Planned Behavior Components

As research on the TPB accumulated, researchers began to identify a number of potentially problematic measurement and conceptual issues with each component of the model. As these issues are directly relevant to the use of the integrated model proposed by Maddux and DuCharme (1997) that will be used in this study, a discussion of these issues is warranted. In this section of the paper the problems surrounding each component of the model will be described as well as the solutions the present study will utilize.

Intentions

This construct is important as, according to the authors of the TPB and TRA, it is the most proximal determinant of behavior. However, there is question regarding the ways intention has been defined and assessed in the literature. A number of researchers have commented on the difference between assessing behavioral intentions (such as "I intend to / plan to engage in

behavior x," or "I will try to…") and behavioral expectations, also known as self-predictions (such as, "How likely is it that you will perform behavior x," or "I will perform the action."), and stated that it is important to consider both when predicting behavior (Fishbein and Stasson, 1990; Maddux and DuCharme, 1997; Sheppard, Harwick, and Warshaw, 1988; Warshaw and Davis, 1985). Although Fishbein and Ajzen's (1975) original definition of intention, "the person's subjective probability that he will perform the behavior in question" (p.12), is certainly more similar to current definitions of what researchers have come to call self-prediction, many researchers have measured intention with "plan to" or "try to" statements regarding the behavior in question. The meta-analysis by Sheppard et al (1998) revealed that, while social norms and attitudes explained less of the variance in self predictions than intentions (R=.61 and .73, respectively) self predictions have stronger relationships with behavior than do intentions (r=.57 and .49, respectively). Sheppard et al. explained this finding by suggesting that making self-predictions involves to a greater extent consideration of the factors that may aid or hinder performance of the behavior, which subsequently increases the predictive utility of the construct with regard to behavior.

To complicate matters further, intentions have also been worded in the form of desires (Armitage and Conner, 1999; Bagozzi, 1992; Conner and Sparks, 1996). An example of an question designed to tap into this notion may be "I *want* to perform behavior x."

Armitage and Conner (2001) examined the nature of the intention, self-prediction, and desire constructs in relation to behavior and the other TPB components. They found that the association between desire and TPB variables was stronger that the association between the TPB variables and either intention or self-prediction. However, the association between desire and behavior was weaker that the association between behavior and either intention or self-

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prediction. Furthermore, perceived behavioral control (PBC) contributed the most additional variance to behavior when desires were assessed, and contributed the least additional variance to behavior when intention and self-prediction were assessed. However, PBC contributed to more of the variance in intention and self-prediction that to desire. So, if people state that they would like to engage in a particular behavior (desire), they are actually less likely to do so than if they state they intend to engage in the behavior. However, they are even more likely to engage in the behavior if they predict that they will than if they simply intend to.

So, given the above issues with the measurement of intention, what, specifically, would be the best way to measure the construct? Conner and Sparks (1996) suggest a multi-item measure consisting of traditional measures of behavioral intention and behavioral expectation as well as measures of desires. Using their guidelines, assessment of intention to adhere to all aspects of an MPC treatment program would look something like this:

Intention

1) I intend to adhere to all aspects of the treatment at the pain clinic.

   Definitely Do Not   Definitely Do

        1   2   3   4   5   6   7

2) I will try to adhere to all aspects of the treatment at the pain clinic.

    Unlikely   Likely

        1   2   3   4   5   6   7

Desire

3) I want to adhere to all aspects of the treatment at the pain clinic.

Strongly Disagree   Strongly Agree

        1   2   3   4   5   6   7

Self-prediction

4) I expect to adhere to all aspects of the treatment at the pain clinic.

Unlikely   Likely

       1   2   3   4   5   6   7

5) How likely is it that you will adhere to all aspects of the treatment at the pain clinic?

Unlikely   Likely

       1   2   3   4   5   6   7

The items would then be summed to get an overall intention score. Of course, the terms "adherence" and "all aspects" would have to be defined in order to meet Ajzen's guidelines of action, target, context, and time; this is merely an example.

Control

There is remarkable inconsistency in TPB research with regard to the measurement and definition of perceived behavioral control. Researchers have begun making distinctions between "perceived behavioral control," "self-efficacy," and "perceived control over behavior," yet these distinctions remain unclear. In this section, I will attempt to summarize major findings in research on the issue of behavioral control.

While many researchers liken perceived behavioral control (PBC) to self-efficacy, there seems to be a growing consensus that these two constructs are dissimilar.   In fact, Bandura (1986, 1992) asserts there is a difference between the constructs and suggests that self-efficacy is based on perceptions of control related to internal factors whereas perceived behavioral control is related to external factors. However, not all researchers define the constructs in these terms. Perceived behavioral control can be thought of as ease or difficulty of performing the behavior (Armitage and Conner, 2001). However, although one may consider a behavior to be difficult,

he or she may nonetheless feel as though the performance of the behavior is entirely under their control. As a result, researchers have also measured what has come to be called "perceived control over behavior," which refers to the degree to which performing a behavior is perceived to be within one's own control. Self-efficacy, on the other hand, is thought of as perceived confidence in one's own ability to perform the behavior.

Studies have supported the distinction between self-efficacy, PBC and perceived control over behavior (Terry and O'Leary, 1995; Manstead and van Eekelen, 1998; White Terry and Hogg, 1994; Armitage and Conner, 1999; Armitage and Conner, 2001). In a meta-analysis of this issue, Armitage and Conner (2001) found that both self-efficacy and PBC were significantly more strongly associated with intentions and behavior than was perceived control over behavior. It should be noted, however, that these researchers coded as PBC any study that used a measure of easy/difficult AND any study that used a combination of measures. Furthermore, the additional variance in behavior and intention explained by perceived control over behavior was found to be both small and unreliable.

With regard to MPC treatment of chronic pain, **self-efficacy** beliefs may be stated as:

1) I believe I have the ability to adhere to all aspects of the treatment program.

> Disagree   Agree
>
> 1   2   3   4   5   6   7

2) To what extent do you see yourself being able to adhere to all aspects of the treatment program?

> Entirely Unable   Entirely Able
>
> 1   2   3   4   5   6   7

3)   How confident are you that you will be able to adhere to all aspects of the program?

Not at all confident   Very confident

1   2   3   4   5   6   7

Items that assess **perceived control over behavior** may be stated as:

1)   Whether or not I adhere to all aspects of the treatment program is entirely up to me.

False   True

1   2   3   4   5   6   7

2)   How much personal control do you feel you have over adhering to all aspects of the

treatment program?

No control at all   Total control

1   2   3   4   5   6   7

3)   How much do you feel that whether or not you adhere to all aspects of the program is

beyond your control.

Completely beyond   Within

my control   my control

1   2   3   4   5   6   7

Finally, an item that assesses **perceived behavioral control** may be stated as:

1)   For me to adhere to all aspects of the treatment program is…

Difficult   Easy

1   2   3   4   5   6   7

Conner and Sparks (1996) suggest using all of the above types of items and using the sum

for the measure of control. Although the vast majority of research has measured control in a

manner similar to the above examples, Ajzen (1991) has in fact suggested that the perceived

likelihood of occurrence of facilitating and inhibiting factors be assessed and weighted by their perceived power. For example, with regard to MPC treatment, items assessing control in this manner would appear as follows.

1)   What is the likelihood of family demands interfering with adherence to all aspects of the treatment program?

Very Unlikely   Very Likely

1   2   3   4   5   6   7

How much would family demands interfere with adhering to all aspects of the treatment program?

No Interference   Extreme Interference

1   2   3   4   5   6   7

Using the above example, which is emphasized by Ajzen, the researcher would have to anticipate or empirically identify facilitating or inhibiting factors that the patients would consider to be at play.

Ajzen (1991) found that belief based measures of control scored on a bipolar scale correlate more highly with global measures than those that were scored on a unipolar scale. However, other researchers (Conner and Sparks, 1996) endorse a unipolar scale.

Social Norms

The social norms component of the model has been shown to have the least power in predicting intentions (Armitage and Conner, 2001; Azjen, 1991). Armitage and Conner (2001) concluded this component's lack of predictive power is likely the results of poor measurement of the construct verses inadequate conceptualization or influence on behavior. Many researchers have used single item measures of this construct, which are problematic for two reasons: 1) they

are not as reliable as multi-item scales, and 2) they do not measure the social norm construct as it is defined by the authors of the model.

As noted above, this component is the result of normative beliefs the person has about individuals in his or her life as well as the person's motivation to comply with those beliefs. For example, "my spouse will approve of my going to counseling" is a normative belief about a significant other, and "Generally I want to do what my spouse desires of me" is an example of the individual's evaluation of the other person's attitude and subsequently their motivation to comply. Thus, in order to adequately measure this component, the researcher must anticipate or empirically identify those people who are most likely to have an influence on the study sample's behavior based on the characteristics of the sample.

Trafimow and Trafimow (1998) used the theory of planned behavior to predict intention to exercise of low back pain patients. They conducted a pilot study in order to identify those individuals who would be most likely to influence the patients' intentions to exercise. They simply asked the patients which individuals in their lives they would think about when evaluating the importance of exercising. Spouses and co-workers were among the most frequent responses. Therefore, spouses and co-workers were included in the Social Norms component of the TBP questionnaire used in this study. In the present study, "Boss/Supervisor" and "Doctor" were also included. The following are two examples of items used in the Social Norms section of the TBP questionnaire.

1) My spouse/significant other thinks I should adhere to all aspects of the treatment program.

      False   -3   -2   -1   0   1   2   3   True

With regard to the treatment program, how much do you want to do what your spouse/significant other thinks you should do?

      Not at all   1   2   3   4   5   6   7   Very Much

2) My co-workers think I should adhere to all aspects of the treatment program.

       False   -3   -2   -1   0   1   2   3   True

With regard to the treatment program, how much do you want to do what your coworkers think you should do?

       Not at all   1   2   3   4   5   6   7   Very Much

Motivation to comply is scored on a unipolar scale because people are unlikely to want to do the opposite of what important persons in their lives would want them to do. Furthermore, scoring normative beliefs on a bipolar scale and motivation to comply on a unipolar scale results in higher correlations between these belief-based measures subjective norms and more global measures of subjective norms (Ajzen, 1991). Global measures of subjective norms are assessed by asking respondents to rate the degree to which an "important" person in their lives would approve of the respondent engaging in a particular behavior. For example,

1) People who are important to me would approve of my adhering to all aspects of the program.

       False 1   2   3   4   5   6   7   True

2) People who are important to me want to adhere to all aspects of the program

       False 1   2   3   4   5   6   7   True

3) People who are important to me think I should adhere to all aspects of the program.

       False 1   2   3   4   5   6   7   True

Conner and Sparks (1996), and Armitage and Conner (2001) recommend against using a single item global measure of subjective norms. The above format of the global Social Norms items was also used by Trafimow and Trafimow (1998).

Attitudes

While there has not been as much difficulty in the measurement and conceptualization of this component of the model, measurement issues common to the assessment of any psychological construct remain. Furthermore, there has been variation in the means by which attitudes are measured in the TPB literature. Many researchers have measured this component through the use of semantic differentials, whereas others have used expectancy-value items. Both approaches will be discussed in the following section.

Strictly speaking, the model considers attitudes to be the combination of outcome beliefs weighted by the evaluation of those outcomes. This means, with regard to MPC treatment, that a number of outcome beliefs associated with MPC treatment common to the majority of chronic pain patients would have to be either anticipated or identified. Then, each person in the sample being studied would indicate his or her perception of the likelihood that each outcome will occur and then provide an evaluation of the outcome.

Trafimow and Trafimow's (1998) asked chronic low back pain patients to report examples of what they thought might happen as a result of engaging in exercise. The three most common responses were 1) pain would decrease, 2) pain would increase, 3) resume normal activity level. These three items were included in this study. As the all of the participants in this study were not working due to a work-related injury, "return to work" was added as another possible outcome of engaging in an exercise program. The following two examples are items included on the Attitudes section of the TBP questionnaire.

1)   Adhering to all aspects of the treatment program will decrease my pain level.

        Very Unlikely   Very Likely

                -3   -2   -1   0   1   2   3

Decreasing my pain level would be…

        Bad   Good

                -3   -2   -1   0   1   2   3

2)   Adhering to all aspects of the treatment program will increase my pain level.

        Very Unlikely   Very Likely

                -3   -2   -1   0   1   2   3

An increase in my pain level would be…

        Bad   Good

                -3   -2   -1   0   1   2   3

Each behavioral belief is multiplied by its evaluation and then all of the products are averaged or summed to obtain an indirect measure of attitude. As one can see, unlike the intention and control constructs, the components of attitudes are rated on a bipolar scale (Ajzen, 1991; Ajzen and Fishbein, 1980). Thus, an outcome that is negatively valued and is believed to be unlikely to occur will contribute to a positive attitude of the behavior. Furthermore, an outcome that positively valued but rated as unlikely to occur will contribute to a negative attitude toward the behavior, and so on.

Although Ajzen and Fishbein (1980) advocate a bipolar rating, it can be argued that that there is justification for using a unipolar rating as well (Dawes, 1972). However, Azjen (1991)

found that bipolar scoring yielded figures that correlated more highly with measures of attitude obtained via semantic differentials, which is a topic to which we will now turn our attention.

Researchers have also used what are considered to be more direct measures of attitudes. These usually consist of a series of semantic differentials pertaining to the behavior in question. With regard to MPC treatment, this type of attitude measurement would look something like this:

1)   Adhering to all aspects of the treatment program would be

Bad	1	2	3	4	5	6	7	Good
Harmful	1	2	3	4	5	6	7	Beneficial
Unpleasant	1	2	3	4	5	6	7	Pleasant
Unenjoyable	1	2	3	4	5	6	7	Enjoyable
Foolish	1	2	3	4	5	6	7	Wise

It has been found that four to six semantic differentials usually have a high internal reliability (alpha >.09) (Conner and Sparks, 1996). It is interesting to note, however, that "direct" measures of attitudes via semantic differentials do not correlate highly with "indirect" measures via expectancy value items, which are advocated by Ajzen and Fishbein (Azjen, 1991; Azjen and Fishbein, 1980, Conner and Sparks, 1996). For example, Azjen and Driver (1991) found that the value-expectancy model was able to explain only 10% to 34% of the variance in the semantic differential model. These figures are similar to those obtained by other researchers who have concluded that there is a relation between the two measurements, although the relationship is often weak (Fishbein and Azjen, 1981; Ajzen, 1974; Doll, Ajzen, and Madden, 1991).

Summary of Measurement Issues

As with any psychological construct, there are number of issues surrounding measurement of TPB constructs. A commonality among all the components of the TPB is the low correlations between belief-based measures of the construct, which are based in value-expectancy theory, and the global measures, which are usually assessed via semantic differentials. This issue likely has the most implications for research and theory with the TPB. Issues with conceptualization and operational definitions can be dealt with by explicitly stating the definition and understanding the impact that particular definition may have on results; research has begun to show how different definitions affect results in TPB studies. Issues with unipolar or bipolar scaling can also be empirically managed as well, and one can look to measurement theory for the most appropriate method given the context. Neither of these issues, however, is likely to significantly affect the fundamental assumptions of the TPB. But the low correlations between belief-based assessments and global assessments may suggest a fundamental shortcoming of value-expectancy theory. This issue can also be examined more closely with the data obtained in this study.

The Integrated Model

As stated earlier, Maddux and DuCharme (1997) suggest that there is much similarity between the major health behavior models, and that they are in fact "simply different arrangements of the same conceptual building blocks" (p 143). The basic components of their integrated model are outcome expectancy, outcome value, self-efficacy, intention, and cue based responses. From these building blocks, they have created an integrated model. Their model is based largely on the theory of planned behavior, as the TPB already contained most of what they considered to be the most important concepts from other health behavior models.

To review, the components of Maddux and DuCharme's model include 1) self efficacy, 2) attitude toward new behavior, 3) attitude toward current behavior, 4) perceived social norms, and 5) intention. The most significant change proposed by Maddux and DuCharme (1997) is the addition of the "Attitude Toward Current Behavior" component. The notions of perceived susceptibility and perceived severity, which are included in both the Health Belief Model and Protection Motivation Theory, are incorporated into this model as part of the "attitude toward current behavior" component. A visual representation of Maddux and DuCharme's model can be seen in Figure 2.

Contribution of the Study

From the points of view of both psychological theory and intervention, it is important to look at those social/cognitive variables that are associated with adherence and that can be changed in therapy that affect the results of the pain management program. This study examines the predictive utility of a health behavior model with chronic pain patients. It also examines the extent to which MPC treatment affects change in the variables included in the models such as perceived behavioral control and attitudes (outcome beliefs and evaluations) toward pain management behaviors. These issues, the predictive utility of the models and the effect of MPC treatment, are both theoretically and clinically meaningful. Furthermore, this study examines the association between the change in these variables and treatment outcome, which may yield more convincing evidence of an association between these variables and outcome measures. Finally, as stated earlier, given the similarities among multidisciplinary pain clinics, it is expected that the results obtained from this study will be useful in informing treatment approaches at MPCs in on the whole.

Hypotheses

It is hypothesized that:

1. Behavioral intentions will predict a significant percentage of the variance in adherence to the MPC program.

2. Perceived social norms, attitudes towards the behaviors in the treatment program, and attitudes toward current behavior will predict behavioral intentions.

3. The patients will demonstrate more favorable attitudes toward the behaviors involved in the treatment program after completion of the program than prior to the program.

4. Patients who report a more favorable change in attitudes toward the behaviors involved in the treatment program will report greater decreases in pain.

CHAPTER 2

METHODS

Participants

Data were collected at four MPCs throughout Texas. One hundred and twenty-four patients were included in the study. Only English-speaking patients at the clinics were included in the study. There were no exclusionary criteria other than inability to speak English. There were no age restrictions, although it should be noted that only individuals above 18 years of age are treated at the clinics from which data were collected. Otherwise, there were no restrictions based on age, gender, or other demographic characteristics.

Measurement

The Staff Observer Adherence Rating Scale

A sample of the adherence rating scale can be found in Appendix A. For the first four items, the staff members rated behavioral dimensions of duration, frequency, accuracy, and time with regard to treatment behaviors via a "yes / no" format. For example, item number 1 states, "Did the patient take part in the behavior for the required duration?" The staff members responded to the question by indicating "yes" or "no" on the rating scale. The specific behavior in question could be walking on a treadmill, doing stretches, attending psycho-educational groups, etc.

For the fifth item of the adherence measure, the staff members indicated the percentage of time the patient engaged in off task behavior. This is defined as any behavior other than the treatment in which the patient should be engaged, such as reading a magazine, talking to friends, going to the break room, etc.

For the sixth and final item of the adherence measure, the staff members indicated the percentage of time the patient engaged in off task behavior *relative to other patients*.

In order to increase the accuracy of the staff members' estimates of behavioral dimensions of adherence, the staff members were instructed in the use of the instrument.

Theory of Planned Behavior Questionnaire (Pre-treatment questionnaire I)

A sample of the pre-treatment questionnaire is found in Appendix B. The questionnaire is divided into 5 parts, A, B, C, D, and E. Part A is a three-item measure of intention to adhere to the treatment program. Per the recommendations of previous researchers cited above, one item assesses "intention" to adhere to the program, one item assesses "desire" to adhere to the program, and one item assesses the patient's estimation of the likelihood of adhering to the program ("self-prediction"). Each of these measures of adherence is assessed via a 7-point Likert scale. The three items were averaged to provide an index of intention.

Part B is a three-item measure of behavioral control. Per the recommendations of the researchers cited above, one item assesses "self-efficacy," one item assesses "behavioral control," and one item assesses "perceived control over behavior." Each of these measures of perceived control is assessed via a 7-point Likert scale. The three items were averaged to provide an index of control.

Part C is a 7-item measure of attitudes toward the treatments at the pain clinic. The first item is a global measure of attitudes in the form of five semantic differentials. The remaining six items have two parts. The first part of the item assesses the patient's beliefs about outcomes of treatment on a bipolar Likert scale on which the patient indicates his or her estimation of the likelihood of a particular outcome. The second part of the item assesses the patients' evaluation of the outcome on a bipolar Likert scale on which the patient indicates how "good" or "bad" the particular outcome would be. The two parts of each item were multiplied together, and the

products of all the items were averaged. Again, the content of the items used in this section was based on previous research (Trafimow and Trafimow, 1998).

Part D is a 6-item measure of perceived social norms. Each item has two parts. For the first part of the item the patient is to rank on a 7-point bipolar (-3 to +3) Likert scale their estimate of the degree to which a significant other would prefer that the patient adhere to the treatment program. For the second part of the item, the patient is to rank on a 7-point, unipolar Likert scale his or her desire to comply with the significant other's wishes. These two parts of the item are multiplied together. The products of the five items are then averaged to obtain a total social norms score. Again, the content of the items used in this section was based on previous research (Trafimow and Trafimow, 1998).

The last section, Part E, is a measure of the patients' attitudes toward their current behavior, which in this case is defined as their behavior prior to beginning treatment at the pain clinic. Items included in Part E are identical to items in Part C, which assesses attitudes. However, in Part E, the patients are to estimate the likelihood of a particular outcome occurring without treatment at the MPC. This section is scored similarly to the section which assesses attitudes.

Attitudes about Specific Treatments (Pre and Post treatment Questionnaire II)

A pre and post-treatment questionnaire was developed in order to evaluate the change in patients' attitudes from pre to post treatment.

An example of these questionnaires can be found in Appendix C. On the pre-treatment questionnaire the subjects indicated on a 10-point Likert scale how important they expected five different treatments would be in helping them manage their pain. The treatments physical therapy, personal counseling, and psycho-educational groups, biofeedback, and "other." The

patients indicated on a 10-point Likert scale how important they expect the treatment program as a whole would be in helping them manage their pain.

Along with questions regarding the management of their pain, the patients were asked to indicate on 10-point Likert scale how much of a decrease in pain would result from each of the interventions as well as from the treatment program as a whole. The format of the post-treatment questionnaire is identical to that of the pre-treatment questionnaire, but the patients were asked to indicate how important they found each of the treatments to be in the management of their pain.

Changes in Attitudes (Post-treatment Patient Questionnaire I)

This questionnaire was originally developed to determine if different magnitudes of changes in attitudes towards the treatments are associated with different magnitudes of pain reduction. While this type of analysis could be completed with the above pre and post treatment questionnaires, an additional questionnaire was developed for the analysis for two reasons. First, the format of this questionnaire provides a measure of attitude change that is more "pure" than the above questionnaires as participants are asked to indicate the amount of attitude change directly. The format of this questionnaire is a bipolar Likert scale with a range of −3 to +3, with −3 indicating a much less favorable attitude and +3 indicating a much more favorable attitude. This decreases the interference of possible cognitive confounds found in the above pain measure. These confounds are similar to those found in satisfaction surveys. For example, if a participant rates their satisfaction of a treatment or a treatment program on a Likert scale, it can be difficult to interpret the meaning of the score. That is, a "5" on a ten point Likert scale may mean that the participant was only moderately satisfied with the program, or it may mean that the patient was satisfied, but was much less satisfied than he or she expected to be prior to beginning the program. It is likely that there will be some aspect of both of these in the participant's response.

Again, a questionnaire that utilizes a bipolar Likert format and inquires directly about changes in attitudes reduces the interference of this type of confound.

A second reason for the inclusion of this questionnaire is to increase the ease of dividing the patients in groups for statistical analysis.

Procedure

Patients at the pain clinics were informed about the nature of the study as well as any benefits and costs involved in their participation via the use of a consent form (Appendix E). The patients were assured that the quality of their treatment at the clinic would not be affected by their decision about their involvement in the study. The patients indicated their agreement to be involved in the study by signing the consent form.

The participants who signed the consent form and agreed to participate in the study completed the two pre-treatment patient questionnaires (Appendices C and D) on the second day of the treatment program. The reason for having participants complete the questionnaire on the second day is because on the first day they are more likely to have limited familiarity with the treatments and behaviors involved in the program. By the second day, as the participants are oriented to the program and their familiarity with the program increases, they will have more knowledge on which to base their responses to the questionnaires.

The participants were asked to complete the post-treatment questionnaires (Appendices D and E) on their last day of the treatment program. They were reminded that completion of the questionnaire is part of the study and was entirely voluntary.

At least once per week (for example, during treatment team meetings) at least two staff members rated the adherence of each participant by completing the Staff Observer Adherence Rating Scale (Appendix A).

There was at least one staff member at each clinic who was responsible for managing the patients' pre and post treatment paperwork. The clinics have a standard packet of paperwork the patients are to complete before and after treatment. The staff at the clinics added to their standard packets of paperwork the two pre-test and two post-test questionnaires used in this study.

A file was created for each participant that was separate from the participant's clinic file. The research questionnaires used in this study were maintained in the separate files by the clinic staff. The only persons besides primary investigator who had access to these files were the staff members who completed the Staff Observer Adherence Rating form and collected the pre and post-test questionnaires.

Data was entered into SPSS by the primary investigator. Though the entered data was checked and rechecked for accuracy, it was not double entered by another researcher. The statistical software package SPSS was used to conduct the statistical analyses.

<center>Design and Statistical Analysis</center>

For hypothesis #1 (association between Intentions and Adherence) a prospective, longitudinal design was used. The subjects' Intentions were measured pre-treatment and the subjects' Adherence to the program was measured by the staff for the following six weeks of treatments. For hypothesis #2 (association between TBP variables and Intentions), the subjects were assessed at one point in time (pre-test). Multiple regression was used to test the hypotheses regarding the utility of the model (hypothesis #1 and hypothesis #2). Regression is a statistical procedure that has been utilized extensively in theory of planned behavior research. Specifically, to test hypothesis # 1, scores on the adherence scale were regressed onto the intentions scores. As stated in the hypotheses, it is predicted that behavioral intentions will

<center>41</center>

predict a significant percentage of the variance in actual behavior. To test hypothesis # 2, intentions was regressed on attitudes toward the behavior, attitude toward current behavior, and subjective norms via a stepwise multiple regression. As stated in the hypotheses, it is predicted that this regression will yield a significant beta for all of the independent variables, and that the model as a whole will predict a significant percentage of the variance in intentions. In sum, the procedures used to test first two hypotheses constitute a test of the model.

Hypothesis #3 states that the patients will demonstrate more favorable attitudes toward the behaviors involved in the treatment program after completion of the program than prior to the program. The original plan to test the change in attitudes about the program was to compare the Pre-test II attitudes and Post-test II attitudes scores via a t-test. However, completed pre and post attitudes questionnaires were available from only 14 participants (this is discussed in the results and discussion sections). Due to this small number it was determined that analysis of these data would be inadequate to test the hypothesis related to attitude change. A post hoc exploration of attitude change was conducted using the scores from Post Test I. Post-test I is the questionnaire in which the participants were asked to rate on a scale from -3 to +3 the amount of change in their attitudes toward the program from beginning the program to the end of the program (-3 = worsening of attitudes and +3 = an improvement of attitudes). To analyze this questionnaire, three groups were created and a Chi-square was conducted. Group 1 consisted of the participants who rated the program as less important than they initially expected, group 2 consisted of those patients who reported that program was as valuable as they expected, and group 3 consisted of participants who reported that the program was more valuable than they initially expected. Evaluating attitude change in this manner reveals how many of the subjects exhibited an attitude

change in a positive direction, although it does not reveal the average magnitude of the overall attitude change.

Examining the percentage of patients who fall into different groups (1. negative attitude change, 2. no attitude change, 3. positive attitude change) a descriptive design was used to examine hypothesis #3. However, the use of a Chi-Square allowed the researcher to determine if there was a statistically significant difference between the number of subjects who fell into each group.

Hypothesis #4 states that patients who report a more favorable change in attitudes toward the behaviors involved in the treatment program will report greater decreases in pain. To examine the association between attitude change and pain level, the original plan was to divide the patients into groups based on their results to item #11 on the Post-test I ("Overall, was the treatment program as important as you expected in helping you manage the pain?") and conduct an ANOVA. Each response to this item, from -3 to +3, would constitute one group, yielding a total of seven groups. However, the small sample size precluded use of an ANOVA. It was determined that conducting a correlation between the above item and item #12 from Post-test II ("How much did your pain decrease as a result of the treatment program") would provide information similar to that which would have been obtained via an ANOVA. Item #12 on Post-Test II is a 10-point likert-type item (1 = no pain decrease at all; 10 = complete elimination of pain). A correlational research design was used for hypothesis #4.

CHAPTER 3

RESULTS

Characteristics of the Sample

Data were collected from a grand total of 124 participants. However, clinical and

administrative constraints precluded the attainment of complete research packets from all 124

participants. As can be seen in the results of the statistical analyses, the number of subjects who

completed questionnaires varied between questionnaire. A discussion of the clinical and

administrative constraints that interfered with data collection is provided in the limitations

section.

Table 1 contains frequency statistics for the variables gender, ethnicity, clinic, and

primary pain location. Table 2 contains descriptive statistics on age, education level, and

number of pain locations.

Assumptions.

Assumptions

When performing the analyses, the assumptions of multiple regression were explored,

namely normality and multicollinearity. With regard to multicollinearity, all of the tolerances

were above .903, which is acceptable. However, the distributions of variables of Adherence,

Intention, and Behavioral Control were negatively skewed.   Using Tabachnick and Fidell (1989)

as a guide, it was determined that the three variables would be transformed in order to bring the

distributions closer to normal. All three variables were reflected in order to make them

positively skewed. After examining the results of three different transformations (square root,

log 10 and inverse) it was determined that computing the inverse yielded the best results for the

Adherence and Inverse variables and log 10 yielded the best results for the Behavioral Control

Table 1

Gender, Ethnicity, Clinic, and Pain Location

		Frequency	Percentage
Gender			
	Male	60	57.1
	Female	45	42.9
	Total	105	100
Ethnicity			
	Caucasian	19	23.8
	African-American	31	38.8
	Hispanic	28	35.0
	Asian	2	2.5
	Total	80	100
Clinic			
	Austin	11	9.6
	El Paso	17	14.8
	Garland	31	27.0
	Houston	56	48.7
	Total	80	100
Pain Location			
	Neck	13	18.8
	Upper Extremities	10	14.5
	Upper Back	1	1.4
	Middle Back	1	1.4
	Lower Back	33	47.8
	Lower Extremities	11	15.9
	Total	69	100

Table 2

Age, Education Level, and Number of Pain Locations

	N	Minimum	Maximum	Mean	SD
Age	72	25	76	48.7	9.99
Education	72	6	16	11.67	2.41
Pain locations	67	1	7	1.79	1.18

Variable. These procedures corrected the Adherence variable, although Intention and Behavioral

Control remained slightly negatively skewed.

Hypothesis 1

The first hypothesis states that participants' reports of their intentions to adhere to the

program will predict their actual adherence behavior. On the Theory of Planned Behavior Pre-

Treatment questionnaire, the participants rated their intentions to adhere to the program on three

likert-type items. Two staff members rated the participants' adherence behavior on a 6-item

Adherence questionnaire at least once per week throughout the program. Multiple regression of

the total scores of these two sets of items revealed that the total Adherence scores obtained from

staff could not be predicted by the total Intentions scores of the patients ($F(1, 36) = 2.701$, $p =$

.109; $R^2 = .07\%$). That is, the participants' intentions to adhere to the program did not in fact

predict their actual adherence behavior. However, of the three different types of adherence

questions, the question, "Relative to other patients, how much time did the patient spend in 'off

task' behavior" was significantly predicted by the participants' intentions scores ($F(1, 18) =$

8.13, $p = .011$; $R^2 = 27.3\%$).

Conversely, of the three different types of Intention questions only the item, "I intend to

do all parts of the program" significantly predicted the staff's total Adherence ratings ($F(1,36) =$

4.34, $p = .044$; $R^2 = 10.8\%$).

Hypothesis 2

The second hypothesis states that the theory of planned behavior variables (social

norms, attitudes, and behavioral control) will predict the patients' intentions to complete the

program. On the Theory of Planned Behavior Pre-treatment questionnaire the patients reported

1) attitudes about doing the program, 2) attitudes about maintaining their current behavior (not

doing the program), 3) perceptions of social norms about doing the program, and 4) their ability

to do the program (behavioral control) via likert-like items. Scores were calculated for each of

the four above variables. The participants' total scores on the Intention items were regressed onto

their scores for the above four variables, 1) attitudes about doing the program, 2) attitudes about

not doing the program, 3) perceived social norms about doing the program, and 4) perceived

behavioral control in doing the program. Stepwise multiple regression revealed that intention to

adhere to the program could be significantly predicted by three TPB variables ($F_{(3, 71)} = 24.66$,

$p < .000$; $R^2 = 51\%$). Significant independent predictors were Attitudes toward adhering to the

program ($B = .471$, $p < .000$), Perceived Behavioral Control ($B = .376$, $p < .000$), and Attitudes

about not doing the program ($B = .203$, $p = .018$). Perceived social norms was not a significant

predictor. The Average scores of the theory of planned behavior variables can be found in

Table 3, and correlations between all of the TBP variables can be found in Table 4.

Table 3

Mean and Standard Deviation of Theory of Planned Behavior Scores

TPB Variable	Mean	SD	N
Intention	6.62	0.68	101
Control	5.85	0.87	101
Attitudes about doing the program	4.3	2.39	101
Perceived Social Norms	8.54	6.66	95
Attitudes about current behavior	2.23	1.19	76

Table 4

Correlations among Theory of Planned Behavior Components

		Control	Intention	Attitudes about doing the program	Social Norms	Attitudes about not doing the program
Behavioral Control	Correlation	1.00	0.57	0.41	0.36	0.08
	Sig. (2-tailed)		0.00	0.00	0.00	0.47
	N	101	101	101	95	76
Intention	Correlation		1.00	0.53	0.33	0.21
	Sig. (2-tailed)			0.00	0.00	0.07
	N		101	101	95	76
Attitudes about doing the program	Correlation			1.00	0.44	0.06
	Sig. (2-tailed)				0.00	0.61
	N			101	95	76
Social Norms	Correlation				1.00	0.20
	Sig. (2-tailed)					0.09
	N				95	75.00
Attitudes about not doing the program	Correlation					1.00
	Sig. (2-tailed)					
	N					76

Hypothesis 3

Hypothesis #3 states that the patients will demonstrate more favorable attitudes toward the behaviors involved in the treatment program after completion of the program than prior to the program. As state above, instead of examining the magnitude and direction of attitudes change between pre and post treatments, it was determined that an equally reasonable approach would be to examine the percentage of subjects who reported changes in attitude in a positive direction. Thus, three groups were created and a Chi-square was conducted in order to test this hypothesis. Group 1 consisted of the participants who rated the program as less important than they initially expected, group 2 consisted of those patients who reported that the program was as valuable as they expected, and group 3 consisted of participants who reported that the program was more

Table 5

Frequencies for the Item, "Overall was the program as important as you thought it would be in pain management?"

Score	Label	Frequency	Percent
-3	Less decrease than expected	0	0
-2		1	3
-1		1	3
0	Same	4	12
1		1	3
2		8	24
3	More decrease than expected	19	56
	Total	34	100

valuable than they initially expected. Frequencies for the Chi-square are found in Table 5. As can be seen from table 5, 28 participants reported that the program as a whole was more important than they thought it would be in pain management, whereas a total of only 6 participants reported no change or a worsening in their attitudes about the importance of the program. This is significant at the .000 level (X^2 (2)=36.94).

Item # 10 on Post test II is a 10-point likert-type scale on which participants rate the degree to which they thought the program was important in helping them manage their pain (1 = not at all important; 10 = very important). The average of this is item was 6.78 with a standard deviation of 2.75. In sum, the vast majority of the patients (82%) developed a more favorable attitude toward the program and the average report of the importance of the program was 6.78 on a 10 point scale. Though Chi Squares were not performed on all of the items in Post-test I, frequencies for all the attitude items in Post-test I can be seen in table 6. Also, average scores on all items of Post-test II can be found in table 7.

Table 6

Frequencies of Responses on Items in Post-test I, Self Reported Changes in Attitudes.

Was physical therapy as important as you thought it would be in pain management?

Score	Label	Frequency	Percent
-3	Less important than expected	0	0
-2		0	0
-1		2	6
0	Same	2	6
1		5	15
2		7	21
3	More important than expected	18	53
	Total	34	100

Was counseling as important as you thought it would be in pain management?

Score	Label	Frequency	Percent
-3	Less important than expected	0	0
-2		2	6
-1		2	6
0	Same	7	21
1		5	15
2		7	21
3	More important than expected	10	30
	Total	33	100

Were psycho-educational group meetings as important as you thought they would be in pain management?

Score	Label	Frequency	Percent
-3	Less important than expected	0	0
-2		1	3
-1		2	6
0	Same	5	15
1		9	26
2		4	12
3	More important than expected	13	38
	Total	34	100

Was biofeedback as important as you thought it would be in pain management?

Score	Label	Frequency	Percent
-3	Less important than expected	0	0
-2		2	7
-1		1	3
0	Same	5	17
1		5	17
2		8	27
3	More important than expected	9	30
	Total	30	100

Overall, was the program as important as you thought it would be in pain management?

Score	Label	Frequency	Percent
-3	Less important than expected	0	0
-2		1	3
-1		1	3
0	Same	4	12
1		1	3
2		8	24
3	More important than expected	19	56
	Total	34	100

Hypothesis 4

Hypothesis #4 states that patients who report a more favorable change in attitudes toward the behaviors involved in the treatment program will report greater decreases in pain. As stated above, to examine this hypothesis, a correlation was conducted on two items: 1) "Overall, was the treatment program as important as you expected in helping you manage the pain?" and 2) "How much did your pain decrease as a result of the treatment program." The correlation between the two items was significant at the .005 level ($F_{(1,20)} = 9.87$; Beta = .575), indicating

Table 7

Averages of Post Test Attitudes Questionnaire

	N	Mean	SD
How important was physical therapy in pain management	23	6.80	2.36
How much did physical therapy decrease your pain	23	5.30	2.57
How important was counseling in pain management	23	6.00	2.65
How much did counseling decrease your pain	23	4.57	2.69
How important was group counseling in pain management	23	5.87	2.32
How much did group counseling decrease your pain	23	4.96	2.70
How important was biofeedback in pain management	19	5.42	2.46
How much did biofeedback decrease your pain	19	4.95	2.72
Average of all importance questions post test	23	6.23	2.11
Average of all pain questions post test	23	5.05	2.46
How important was the program overall in pain management	23	6.78	2.75
How much did the program decrease your pain	23	5.39	2.69

that an improvement of attitudes about the program was associated with an improvement in pain ratings.

Furthermore, a Chi-square was conducted to examine the number of patients who reported a 1) greater than expected decrease in pain, 2) less than expected decrease in pain, and 3) similar to expected decrease in pain. The Chi-square was significant beyond the .0009 level ($X(2) = 25.12$). Frequencies for observed and expected values can be seen in table 8. In sum, the majority of patients 74% reported experiencing a greater decrease in pain than expected, and the average amount of pain decrease was 5.39 on a 10-point scale.

Table 8

Frequencies of the Item, "Overall, did the program decrease your pain as much as you expected?"

Score	Label	Frequency	Percent
-3	Less decrease than expected	1	3
-2		1	3
-1		1	3
0	Same	6	18
1		8	24
2		7	21
3	More decrease than expected	10	29
	Total	34	100

CHAPTER 4

DISCUSSION

Hypothesis 1

In this study, the total Adherence score was not predicted by the total Intention score, i.e. intention to perform the behavior did not predict actual behavior. Only one of the Adherence questionnaire items was significantly predicted by the intentions scores ("Relative to other patients, how much time did this patient spend in off task behavior?"). This could be a spurious result. However, this association was significant at the .011 level. Furthermore, the total Behavioral Control score was also significantly associated with the "relative off task behavior" item. These results are congruent with the theoretical framework of the theory of planned behavior, as Ajzen asserts that in his model that behavioral control predicts both intentions and actual behavior. Assuming the association with the one adherence item is a reliable finding, why was this particular question related to intentions while the other two questions were unrelated?

There are a few possible explanations for the lack of association between the total intentions scores and adherence scores. First, the intention items may simply be ineffective at reliably capturing the subject's intention to complete the program. Closer examination found that "I intend to do all parts of the program" was the only intention item that significantly predicted the total adherence scores. "I want to do all parts of the program" and "how likely is it that you will adhere to all parts of the program" did not significantly predict total adherence scores. This suggests that the participants' judgments on their resolve to do the program influenced their actual behavior more strongly than did their report of their desire to do the program or their estimation of the likelihood of doing the program. However, these results should be interpreted with caution given the small sample size.

Second, the items used on the adherence scale were ineffective in capturing the adherence behavior of the subjects. However these were developed very closely to Ajzen's guidelines. Also, with regard to the adherence items, another explanation could be that the "relative off task behavior" item was easier than the other two types of questions for the staff to understand and conceptualize when making their ratings.

Third, the patients' notions of "doing all parts of the program" may simply be different than those of the pain clinic staff. Thus, the patients may fully intend to do all parts of the program but the intention scores would not be related to the staff's adherence scores because the two groups have different notions of what it means to do all parts of the program.

Finally, work-related injuries are socially and economically complex phenomena. It is possible that issues surrounding work related injuries complicate and confound the relationship between self reports of behavioral intentions and behavior itself. As stated earlier, there are a number of demographic and descriptive variables that have been associated with adherence to an MPC program, such as length of time since injury, job satisfaction, perceived disability, compensation status, and litigation status. It is important to remember that, as a cognitive model of behavior, the TBP can explain at most the amount of variance in behavior that is the result of attitudes and beliefs. Thus, given the other environmental, economic, and medical variables that are at play, the influence of a self report of intentions to engage in the MPC program simply may not be as important as it is with other health related behaviors. It would be interesting to design a study that would allow examinations of these variables and the TBP variables concurrently.

The average intention score was actually quite high, M = 6.62, SD = .68, so the patients may have really set their minds on doing the program but the above factors may have interfered with their execution of the behaviors involved in the program. Perhaps as the prospect of

returning to a job with extremely poor and unsafe work conditions became more real, their behavior in the program became less adherent. Or perhaps they had been disabled for such a long time that the physiological and psychosocial phenomenon associated with the experience of disability were insurmountable despite a strong resolve to adhere to the program.

Similar to this last notion, the notion of the experience of pain as a barrier to certain behaviors deserves attention. In theoretical framework of the TBP, it is assumed that people tacitly or explicitly consider barriers to completion of a certain behavior when reporting their attitudes about that specific behavior. For example, barriers to beginning an exercise program may include the expense of joining a gym or purchasing equipment or clothes, weather conditions unfavorable to exercising outdoors, or the discomfort associated with beginning an exercise program. An example of another specific behavior is diet and eating behavior. Barriers in adopting a more healthy diet might include difficulty finding time with meal preparation or limited knowledge of healthy foods. But of all factors that have been cited by researchers or patients as potential barriers to behavior change, the experience of acute pain is likely one of the most salient barriers with the most direct and immediate effect on behavior.

As an example, consider a person who hits his or her thumb when hammering a nail. Does the hammering continue after the thumb is struck? Usually, the behavior is discontinued and a variety of behavioral, cognitive, and emotional phenomena occur. Behaviorally, the hammering is discontinued, the injured thumb is held tightly by the other hand, the person grimaces and usually exhibits changes in body posture. Emotions of fear and/or anger are experienced and accompanied by thoughts about the pain, the act itself, and possible serious injury. A similar phenomenon is seen in chronic pain patients when engaging in a behavior that increases pain level. The most important aspect of the above example is that the behavior is

discontinued, and the discontinuation usually results in a decrease or disappearance of the pain.

Relative to other examples of barriers to behavior change, the above example involves a distillation of behavioral principles. It involves direct immediate consequences such as punishment and negative reinforcement. In sum, with the above considerations in mind, the experience of pain might itself be a very powerful barrier to engaging in the types of behaviors that have been shown to be beneficial to long term pain management (physical activity and stretching, for example). Subsequently, despite strong intentions to do these behaviors, pain interferes with translating intention into actual behavior, explaining the lack of association between intentions and adherence. This does not mean that MPC treatment is inherently painful. However, persons with chronic pain might be more susceptible to pain and more likely to interpret a bodily sensation as painful. Further, they likely expect to experience pain when engaging in certain behaviors, and that expectation influences their experience of pain.

Hypothesis 2

This study found that the patients' intentions to exercise could be predicted by three of the TBP variables, Attitudes toward new behavior (doing the program), Behavioral Control, and attitudes toward current behavior (not doing the program). The total R of the model was .714, which almost identical to the average correlation of .71 found in Ajzen's review of 16 studies examining the prediction of Intentions from the TBP variables. In this study, the TBP variables predicted 49% of the variance in intentions, whereas the Armitage and Conner (2001) review of 185 studies found that the model accounted for 39% of the variance in intentions.

Hypothesis 3

Eighty-two percent of the patients reported developing a more favorable attitude toward the program overall from the time they began the program to the time they completed the

program. Furthermore, the vast majority of all patients reported developing a more favorable attitude towards every single part of the program, including psycho-educational groups, counseling, physical therapy, and biofeedback. Their average report of the importance of the overall program was 6.78 on a 10 point scale (1 = not at all important; 10 =extremely important). There are a number of implications of this finding. First, though MPCs have been shown to be effective in treating pain and preventing disability, even in relation to more traditional treatments such as surgery, they continue to be a last resort to treatment and are not yet considered to be within mainstream treatments. The finding that most patients develop a much more favorable attitude about the program at its completion provides even more support for the effectiveness of MPC treatment.

Second, for a number of reasons, many patients are skeptical of MPC treatment. For example, by the time they are referred to MPC treatment, many patients have become frustrated and disillusioned by the medical community and are skeptical of any treatment. Furthermore, the notion that exercise, biofeedback, counseling, and education can help people manage their pain is a difficult notion for many patients to accept, and some patients are offended by referral to such treatment believing that such a referral must mean that their doctors think their pain is "all in their heads." Finally, it is hard for many patients to accept that there is not a more traditional medical treatment that will help with their pain. All of the above factors contribute to some resistance towards MPC treatment. However, many patients will likely be encouraged by the fact that so many individuals who have completed MPC treatment developed a much more favorable attitude about it. If new patients are educated about others' positive experiences, they will likely be much more likely to engage themselves in the process of MPC treatment.

The third and final implication of this finding may be the most important. Throughout the

program the participants developed a more favorable attitude toward many of the behaviors that have been associated with successful pain management, including physical activity such as exercise and stretching, relaxation training, counseling, and various skills discussed in psycho-educational groups. With a better understanding and appreciation of the ways these interventions can help with pain management, the patients are more likely to make lifestyle changes that include associated behaviors. Presumably, with these changes, the patients will become better at managing their pain, experience less disability, and have a better quality of life. However, this is, of course, just speculation and would be an appropriate avenue for additional empirical research.

Hypothesis 4

As was expected, greater decreases in pain were accompanied by more favorable changes in attitude toward the multidisciplinary program. Two findings associated with hypothesis #4 are important to discuss.

First, it was found that the majority of patients (nearly 75%) reported experience a much greater pain decrease than they anticipated at the beginning of the study. The implications of this finding are similar to those of hypothesis #3 regarding the patients' rating of the importance of the program in pain management. That is, new patients will likely be much less resistant to the process of MPC treatment with increased knowledge about the positive experiences of others who have completed MPC treatments. Also, these results contribute to the body of research demonstrating the effectiveness of MPC treatments.

Second, the patients reported a moderate amount of pain relief. The subjects rated the amount of pain decrease on a 10-point liker-type item (1 = no pain decrease; 10 = complete elimination of pain). The average pain decrease was 5.39. This can be roughly translated into a 50% decrease in pain, which is considerable given 1) the amount of average amount of pain

MPC patients have when beginning treatment and 2) the duration of time they have been in pain.

Conclusions

The following is a summary of findings of this study.

1   The majority of the patients (82%) developed a more favorable attitude toward the program and their average report of the importance of the program was 6.78 on a 10-point scale.

2   The majority of patients (74%) reported experiencing a greater decrease in pain than expected, and the average amount of pain decrease was 5.39 on a 10-point scale.

3   TBP components predicted Intentions in a pattern similar to that of previous research. That is, Attitudes and Behavioral Control were both relatively strong predictors of Intentions, whereas Social Norms was neither a strong nor significant predictor of intentions.

4   Attitudes About Current Behavior (not doing the program) added a significant amount of variance to the prediction of Intention, supporting the use of this variable as asserted by Maddux and Ducharme.

5   Total Intentions scores did not predict Total Adherence scores.

6   Further research is needed to explore the relationship between Intentions questions and adherence questions in a sample of chronic pain patients. Limitations

One of the main limitations of this study was the relatively small sample size. With a larger sample, analyses could be conducted with a larger number of variables such as those that have been shown to be associated with completion of MPC treatment. Because of the small sample size in this study, these variables could not be included in a regression along with the TBP variables. Also, the small sample size precluded closer examination of the relationship between different types of items in the TBP questionnaire.

The small sample size was due largely to difficulty with data collection. During data collection, the clinics were reviewed by the CARF accrediting board in order to maintain their accreditation. During this time, when the staff's work was greatly increased due to the CARF demands and their attention was focused elsewhere, data was not being collected as consistently as it was prior to the CARF review. It is understandable that this would occur in a clinical setting as loss of CARF accreditation would severely impact the clinics' referrals. Another clinical constraint was staff changes. New staff members responsible for having the patients complete the questionnaires had to be trained frequently. Finally, as in many exclusively clinical settings research duties are easily overlooked in an effort to 1) maintain appropriate patient care and 2) ensure financial and administrative objectives are being met. An ideal situation would have been to have research assistants at each of the sites to ensure that the data collection agreement was being implemented as designed. However, this was unable to be accomplished in the present study. Generally, the data collection procedures agreed upon by the three parties (the primary investigator of this study, the research manager of the clinics, and the clinics' staff) were not consistently implemented as designed.

Another limitation of this study was lack of follow up. It would have been interesting to conduct brief follow up evaluations to examine the extent to which maintained their skills in pain management and continued employing some of the pain management strategies learned in the MPC program.

<div align="center">Suggestions for Future Research</div>

1   Include all variables that have been found in previous research to be associated with completion of MPC treatment in a regression model with the theory of planned behavior variables. It would be interesting to include variables such as duration of disability, job

satisfaction, and litigation status into a multiple regression predicting adherence behavior and then examine the extent to which the TBP variables explain additional variance in adherence.

2   Employ research assistants to manage the data collection. This would prevent clinical and business issues from interfering with data collection.

3   It would be useful to replicate this study with a larger sample and explore the association between adherence and intention items. With a larger sample size, more variables could be included in multiple regressions, allowing more detailed exploration of the associations between different kinds of items.

4   Given that the majority of patients reported that counseling, exercise, and psycho-educational groups turned out to be more important than expected in pain management, it would be interesting to examine the extent to which the patients continued an exercise program or maintained changes as a result of the psycho-educational groups after discharge from the MPC treatment. Though the majority of people have difficulty maintaining lifestyle changes, it may be easier for participants in this study as they developed more favorable attitudes about certain dimensions of lifestyle changes throughout the program.

Figure 1. The theory of planned behavior.

| Belief about   x   Evaluation outcomes   of outcomes |
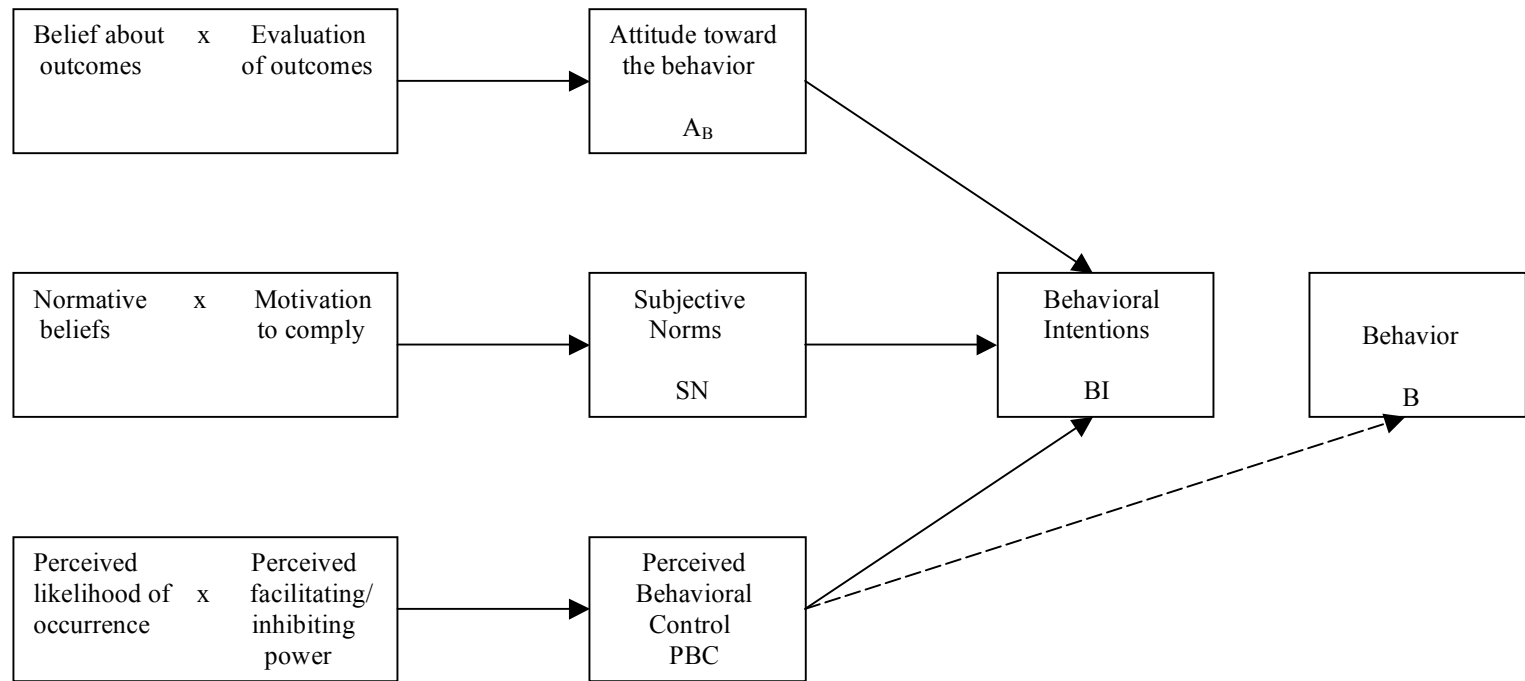
Figure 2. The revised theory of planned behavior (Maddux and DuCharme, 1997).
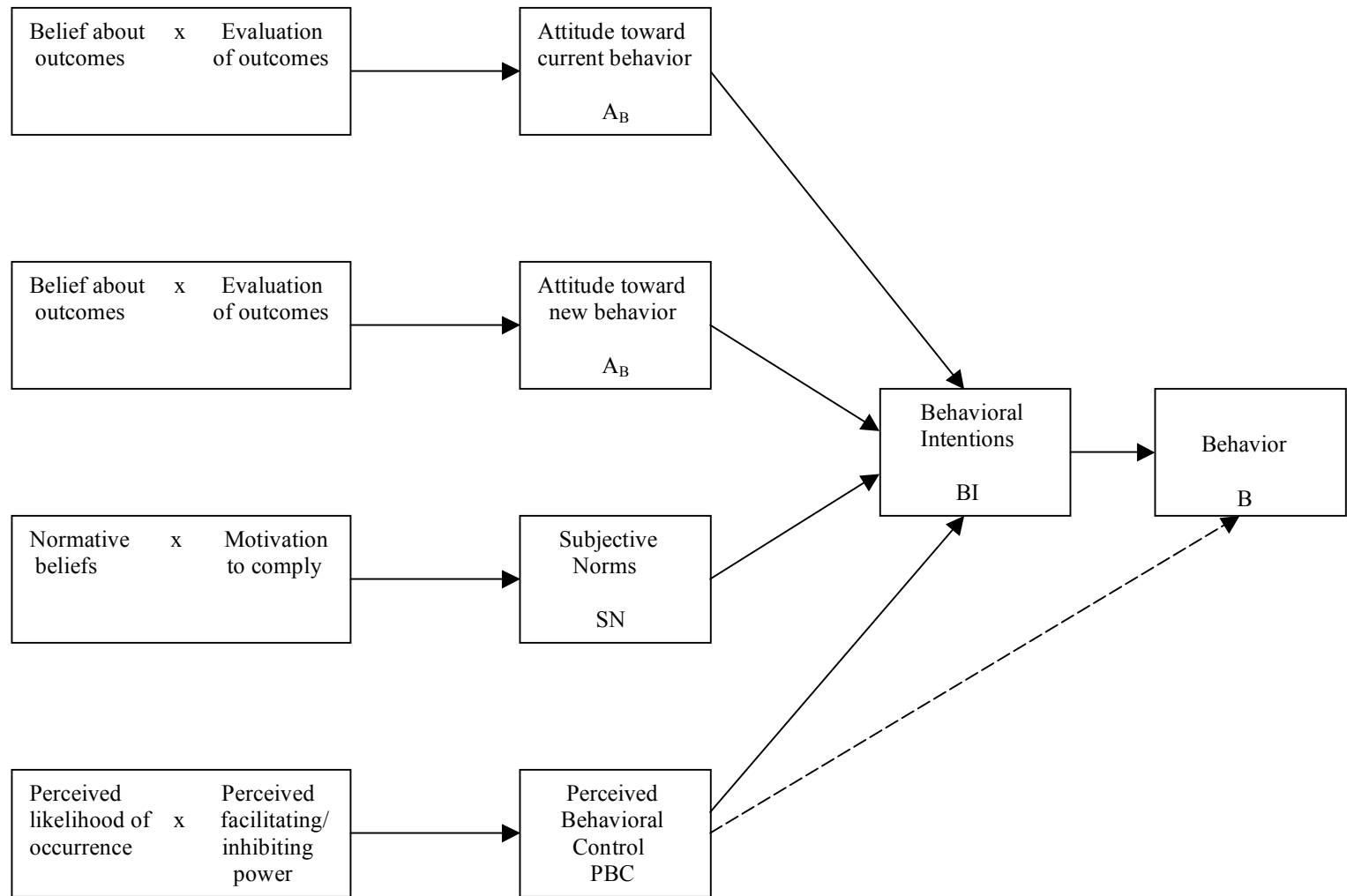
APPENDIX A

STAFF OBSERVER ADHERANCE RATING SCALE

Patient's Name: _____

Date: _____

1) Did the patient take part in the treatment for the required duration?

   Yes / No

2) Did the patient take part in the treatment at the required frequency?

   Yes / No

3) Did the patient perform the treatment with the required accuracy?

   Yes / No

4) Did the patient perform the treatment at the required time?

   Yes / No

5) What percentage of the time was the patient engaged in "off task" behavior?

   0-10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

6) Relative to other patients, how much time was the patient engaged in "off task" behavior?

   0-10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

APPENDIX B

PRE-TREATMENT PATIENT QUESTIONNAIRE I

(THEORY OF PLANNED BEHAVIOR)

Pre-treatment
Patient Questionnaire

Name:_____

Date: _____

       In this questionnaire, you will be asked to rate your attitudes about all of the different treatments included in the program at Positive Pain Management. There are several questions regarding your attitudes about "**doing all parts**" of the treatment program. **"Doing all parts"** of the treatment program means that you:

1)   Actively engage in all of the different treatments at the required **time** (you show up on time to the treatment)

2)   Actively engage in all of the different treatments for the required **duration** (you do the treatment for the required length of time)

3)   Actively engage in all of the different treatments for the required **frequency** (you do the treatment as many times as required)

4)   Actively engage in all of the different treatments with the required **accuracy** (you properly execute the treatment)

Please keep this in mind when responding to the questions. The following is an example of a question in the questionnaire:

1) How important is it that you adhere to all aspects of the treatment program?

Not Important							**Very Important**	
1	2	3	4	5	6	7	8	9

      In responding to the above question, you would think about all of the different treatments at Positive Pain Management (exercises, physical therapy, counseling, educational groups, massage, etc.). You would then think about how important it is to **adhere** to all of the treatments by doing them for the required **duration, frequency, accuracy** and at the required **time**. If you think it is very important to do this, you would circle the "9." If you think it is not important to do these things, you would circle the "1."

Part A.
1) I intend to do all parts of the treatment at the pain clinic.
   Definitely Do Not   **Definitely Do**
          1   **2**   **3**   **4**   **5**   **6**   **7**

2) I want to do all parts of the treatment at the pain clinic.
   Strongly Disagree   **Strongly Agree**
          1   **2**   **3**   **4**   **5**   **6**   **7**

3) How likely is it that you will do all parts of the treatment at the pain clinic?
   Unlikely   **Likely**
          1   **2**   **3**   **4**   **5**   **6**   **7**

Part B.
1) I believe I have the ability to do all parts of the treatment program.

   Disagree   **Agree**
          1   2   3   4   5   6   7

2) Whether or not I do all parts of the treatment program is entirely up to me.

   False   **True**
          1   **2**   **3**   **4**   **5**   **6**   **7**

3) How much personal control do you feel you have over doing all parts of the treatment program?

   No control at all   **Total control**
          1   2   3   4   5   6   7

Part C.
1) Doing all parts of the treatment program would be

Bad	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Good**
Harmful	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Beneficial**
Unpleasant	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Pleasant**
Unenjoyable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Enjoyable**
Foolish	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Wise**

2)   Doing all parts of the treatment program will *decrease* my pain level.
        Very Unlikely   **Very Likely**
                -3   -2   -1   0   1   2   3

        Decreasing my pain level would be…
                Bad   **Good**
                -3   -2   -1   0   1   2   3

3)   Doing all parts of the treatment program will *increase* my pain level.
        Very Unlikely   **Very Likely**
                -3   -2   -1   0   1   2   3

        An increase in my pain level would be…
                Bad   **Good**
                -3   -2   -1   0   1   2   3

4)   Doing all parts of the treatment program will help me return to work.
        Very Unlikely   **Very Likely**
                -3   -2   -1   0   1   2   3

        Returning to work would be…
                Bad   **Good**
                -3   -2   -1   0   1   2   3

5)   Doing all parts of the treatment program will help me increase my activity level.
        Very Unlikely   **Very Likely**
                -3   -2   -1   0   1   2   3

        Increasing my activity level would be…
                Bad   **Good**
                -3   -2   -1   0   1   2   3

6)   What else do you think might happen if you did all parts
        of the treatment program? _____

        How likely is it that this will occur?
        Very Unlikely   **Very Likely**
                -3   -2   -1   0   1   2   3

        If this occurred, it would be…
                Bad   **Good**
                -3   -2   -1   0   1   2   3

Part D.

1) My spouse/significant other thinks it would be good for me to do all parts of the treatment program.

    False **-3** **-2** **-1** **0** **1** **2** **3** **True**

With regard to the treatment program, how much do you want to do what your spouse/significant other thinks you should do?

    Not at all **1** **2** **3** **4** **5** **6** **7** **Very Much**

2) My co-workers think it would be good for me to do all parts of the treatment program.

    False **-3** **-2** **-1** **0** **1** **2** **3** **True**

With regard to the treatment program, how much do you want to do what your coworkers think you should do?

    Not at all **1** **2** **3** **4** **5** **6** **7** **Very Much**

3) My Doctor thinks it would be good for me to do all parts of the treatment program.

    False **-3** **-2** **-1** **0** **1** **2** **3** **True**

With regard to the treatment program, how much do you want to do what your Doctor thinks you should do?

    Not at all **1** **2** **3** **4** **5** **6** **7** **Very Much**

4) My Boss/Supervisors think it would be good for me to do all parts of the treatment program.

    False **-3** **-2** **-1** **0** **1** **2** **3** **True**

With regard to the treatment program, how much do you want to do what your Boss/Supervisors think you should do?

    Not at all **1** **2** **3** **4** **5** **6** **7** **Very Much**

5) My friends think it would be good for me to do all parts of the treatment program.

    False **-3** **-2** **-1** **0** **1** **2** **3** **True**

With regard to the treatment program, how much do you want to do what your friends think you should do?

    Not at all **1** **2** **3** **4** **5** **6** **7** **Very Much**

6) People who are important to me would approve of my doing all parts of the program.

    False **1** **2** **3** **4** **5** **6** **7** **True**

7)   People who are important to me think I should do all parts of the program.
       False   1   2   3   4   5   6   7   True

8)   People who are important to me think it would be good for me to do all parts of the program.
       False   1   2   3   4   5   6   7   True

Part E.

1)   Sometimes, pain problems can lead to other medical difficulties that are related to the pain. On a scale from 1 to 10, how likely do you think it will be that you will experience additional medical difficulties **without** treatment at Positive Pain Management, Inc.
       Not   Very
       Likely   Likely
       1   2   3   4   5   6   7   8   9   10

2)   What is the likelihood of your pain level decreasing **without** treatment at Positive Pain Management?
       Very Unlikely   Very Likely
            -3   -2   -1   0   1   2   3

4)   What is the likelihood of your pain level increasing **without** treatment at Positive Pain Management?
       Very Unlikely   Very Likely
            -3   -2   -1   0   1   2   3

5)   What is the likelihood that you will return to work **without** treatment at Positive Pain Management?
       Very Unlikely   Very Likely
            -3   -2   -1   0   1   2   3

6)   What is the likelihood that your activity level will increase **without** treatment at Positive Pain Management?
       Very Unlikely   Very Likely
            -3   -2   -1   0   1   2   3

APPENDIX C

PRE- AND POST-TREATMENT PATIENT QUESTIONNAIRES II

(ATTITUDES ABOUT SPECIFIC TREATMENTS)

Pre Treatment Questionnaire II

Name:_____   Date:_____

1)   How important do you expect physical therapy (exercises and stretching) will be in helping you manage the pain?

Not At All   **Very**
Important   **Important**
          1   2   3   4   5   6   7   8   9   10

2)   How much will your pain decrease as a result of physical therapy?

                                                                                                          Complete
                                                                                                          Elimination
          None   **of Pain**
          1   2   3   4   5   6   7   8   9   10

3)   How important do you expect individual counseling will be in helping you manage the pain?

Not At All   **Very**
Important   **Important**
          1   2   3   4   5   6   7   8   9   10

4)   How much will your pain decrease as a result of individual counseling?

                                                                                                          Complete
                                                                                                          Elimination
          None   **of Pain**
          1   2   3   4   5   6   7   8   9   10

5)   How important do you expect group counseling sessions will be in helping you manage the pain?

Not At All   **Very**
Important   **Important**
          1   2   3   4   5   6   7   8   9   10

6)   How much will your pain decrease as a result of group counseling sessions?

                                                                                                          Complete
                                                                                                          Elimination
          None   **of Pain**
          1   2   3   4   5   6   7   8   9   10

7)	How important do you expect biofeedback will be in helping you manage the pain?

Not At All   **Very**
Important   **Important**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

8)	How much will your pain decrease as a result of biofeedback?

                                                      Complete
                                              Elimination
None   **of Pain**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

9)	How important do you expect another treatment offered at PPM will be in helping you manage the pain?
(please write down the treatment you have in mind:_____)

Not At All   **Very**
Important   **Important**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

10)	How much will your pain decrease as a result of the treatment you mentioned above?

                                                    Complete
                                              Elimination
None   **of Pain**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

11)	Overall, how important do you expect the treatment program at Positive Pain Management will be in helping you manage the pain?

Not At All   **Very**
Important   **Important**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

12)	Overall, how much will your pain decrease as a result of the treatment program at Positive Pain Management

                                                    Complete
                                              Elimination
None   **of Pain**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

13)   For all of the above treatments (physical therapy, individual counseling, group counseling sessions, biofeedback, other treatments), please indicate which you think will be the 1st, 2nd, 3rd, 4th, and 5th most important in helping you manage the pain.

Most important _____

2nd most important _____

3rd most important _____

4th most important _____

5th most important _____

Post Treatment Questionnaire II

Name:_____   Date:_____

1) How important was physical therapy (exercises and stretches) in helping you manage the pain?

Not At All   **Very**
Important   **Important**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

2) How much did your pain decrease as a result of physical therapy?

                                          Complete
                                    Elimination
None   **of Pain**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

3) How important was individual counseling in helping you manage the pain?

Not At All   **Very**
Important   **Important**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

4) How much did your pain decrease as a result of individual counseling?

                                          Complete
                                    Elimination
None   **of Pain**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

5) How important were group counseling sessions in helping you manage the pain?

Not At All   **Very**
Important   **Important**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

6) How much did your pain decrease as a result of group counseling sessions?

                                          Complete
                                    Elimination
None   **of Pain**
  1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

7) How important was biofeedback in helping you manage the pain?

Not At All   **Very**
Important   **Important**
   1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

8) How much did your pain decrease as a result of biofeedback?

                                                Complete
                                      Elimination
None   **of Pain**
   1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

9) How important were other treatments offered by PPM in helping you manage the pain?

Not At All   **Very**
Important   **Important**
   1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

10) How much did your pain decrease as a result of the other treatments?

                                                Complete
                                      Elimination
None   **of Pain**
   1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

* Please indicate the other treatment(s) that you found helpful:_____

11) Overall, how important was the treatment program at Positive Pain Management in helping you manage the pain?

Not At All   **Very**
Important   **Important**
   1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

12) Overall, how much did your pain decrease as a result of the treatment program at Positive Pain Management

                                                Complete
                                      Elimination
None   **of Pain**
   1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**   **10**

13) all of the above treatments (physical therapy, individual counseling, group counseling sessions, biofeedback, other treatments), please indicate which were the 1st, 2nd, 3rd, 4th, and 5th most important in helping you manage the pain.

Most important _____

2nd most important _____

3rd most important _____

4th most important _____

5th most important _____

APPENDIX D

POST-TREATMENT PATIENT QUESTIONNAIRE I

Post Treatment Questionnaire I

Name:_____   Date:_____

1)   Was physical therapy as important as you expected in helping you manage your pain?

                                    Same
Less Important   -3   -2   -1   0   1   2   3   More Important
 Than Expected   Than Expected

2)   Did physical therapy decrease your pain as much as you expected?

                                    Same
Less Decrease   -3   -2   -1   0   1   2   3   More Decrease
 Than Expected   Than Expected

3)   Was individual counseling as important as you expected in helping you manage your pain?

                                    Same
Less Important   -3   -2   -1   0   1   2   3   More Important
 Than Expected   Than Expected

4)   Did individual counseling decrease your pain as much as you expected?

                                    Same
Less Decrease   -3   -2   -1   0   1   2   3   More Decrease
 Than Expected   Than Expected

5)   Were group counseling sessions as important as you expected in helping you manage your pain?

                                    Same
Less Important   -3   -2   -1   0   1   2   3   More Important
 Than Expected   Than Expected

6)   Did group counseling sessions decrease your pain as much as you expected?

                                    Same
Less Decrease   -3   -2   -1   0   1   2   3   More Decrease
 Than Expected   Than Expected

7)   Was biofeedback as important as you expected in helping you manage your pain?

                                    Same
Less Important   -3   -2   -1   0   1   2   3   More Important
 Than Expected   Than Expected

8)   Did biofeedback decrease your pain as much as you expected?

                                    Same
Less Decrease   -3   -2   -1   0   1   2   3   More Decrease
 Than Expected   Than Expected

9)   Were other treatments as important as you expected in helping you manage your pain?

                                        Same
Less Important   -3   -2   -1   0   1   2   3   More Important
 Than Expected   Than Expected

10)   Did other treatments decrease your pain as much as you expected?

                                        Same
Less Decrease   -3   -2   -1   0   1   2   3   More Decrease
 Than Expected   Than Expected

Please write down the treatments you found helpful at PPM:_____

11)   Overall, was the treatment program at Positive Pain Management as important as you expected in helping you manage your pain?

                                        Same
Less Important   -3   -2   -1   0   1   2   3   More Important
 Than Expected   Than Expected

12)   Overall, did the treatment program at Positive Pain Management decrease your pain as much as you expected?

                                        Same
Less Decrease   -3   -2   -1   0   1   2   3   More Decrease
 Than Expected   Than Expected

APPENDIX E

INFORMED CONSENT FORM

RESEARCH CONSENT FORM

Subject Name: Date:

Title of Study: The Association Between the Theory of Planned Behavior and Adherence to a Multidisciplinary Chronic Pain Treatment Program.

Principal Investigator: Randall Edward Rogers

Co-investigators: James Hall, Ph.D.

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the proposed procedures. It describes the procedures, benefits, risks, and discomforts of the study. It also describes the alternative treatments that are available to you and your right to withdraw from the study at any time. It is important for you to understand that no guarantees or assurances can be made as to the results of the study.

Generally speaking, one purpose of this research project is to determine what kinds of things are associated with successful completion of the treatment program at Positive Pain Management. This information will help in finding ways to increase the likelihood that patients here will receive the most benefit possible from the program.

Another purpose is to see what effect the program has on people's attitudes about issues surrounding their pain. Again, it is hoped that this information will help increase the benefit of the program to future patients.

To accomplish these objectives, a theory of human behavior called "The Theory of Planned Behavior" will be utilized. This theory suggests that there are four things that contribute to a person's behavior – 1) the person's attitude toward the behavior, 2) the person's belief that others would approve of the behavior, 3) the amount of control a person has over performing the behavior, and 4) the person's stated intention to perform the behavior. This study will examine the extent to which these factors are associated with adherence to the behaviors involved in the pain management program at Positive Pain Management. In this study "adherence" is defined as the extent to which a person engages in the treatment behaviors at the required time, duration, and frequency.

If you would like to participate, all you will be asked to do is complete two (2) brief questionnaires upon beginning your treatment here, and two (2) brief questionnaires upon your discharge.

Your involvement in this study will not affect your treatment here. You will not receive better treatment if you choose to participate and you will not receive worse treatment if you choose not to participate. You have the right to discontinue your involvement in the research at any time.

Your participation in this study is not expected to affect you negatively, although some of the questions might be uncomfortable for you and painful feelings might arise. In such a case, you will have the opportunity to talk to a counselor. It will take a total of 10 to 15 minutes of your time to complete the questionnaires. Information gathered from staff members at Positive Pain Management will also be used in this research. There are no forseen risks to any other individuals who are not directly involved in the study.

Although no direct benefits are promised, benefits you may experience from participating include a possible increase in awareness of your attitudes and beliefs about many issues surrounding your pain, as well as the satisfaction of contributing to a worthy cause.

The information gathered in this study will be used to evaluate the program at Positive Pain Management. It will also be communicated to the professional research and health community.

Any data that may be published in scientific journals will not reveal the identity of the research participants. The primary investigator of the study will create a file for each participant that is separate from the participant's clinic file. The investigator will maintain the records and filing system throughout the duration of the study. The only person besides primary investigator who will access these files is the staff member who collects the pre and post-test questionnaires. Various staff members will collect data on the participants that will be used in the statistical analysis. Records will be maintained at the clinic and will not be removed from the site.

As a participant in research, you have the following rights. These rights include but are not limited to the participant's right to:
- be informed of the nature and purpose of the experiment
- be given an explanation of the procedure to be followed in the experiment
- be given a description of any attendant discomforts and risks reasonable to be expected
- be given an explanation of any benefits to the research participant reasonably to be expected, if applicable
- be given the opportunity to ask questions concerning the experiment of procedures involved.
- Be instructed that consent to participate in the experiment may be withdrawn at any time and the research participant may discontinue participation without prejudice
- Be given a signed copy of the signed and dated consent form

- Be given the opportunity to decide to consent or not to consent to an experiment without the intervention of any element of force, fraud, deceit, duress, coercion, or the undue influence of the research participant's decision.

This research study has been reviewed and approved by the UNT Committee for the Protection of Human Subjects (940) 565-3940.

RESEARCH SUBJECTS' RIGHTS: I have read or have had read to me all of the above.

_____ has explained the study to me and answered all of my questions.   I have been told the risks or discomforts and possible benefits of the study. I have been told of other choices of treatment available to me.

I understand that I do not have to take part in this study, and my refusal to participate or to withdraw will involve no penalty or loss of rights or benefits or legal recourse to which I am entitled. The study personnel may choose to stop my participation at any time.

In case there are problems or questions, I have been told I can call Randal Rogers at telephone number 940 565 2671 or Dr. James Hall, Associate Professor UNT Health Science Center at telephone number 817 735 2000.

I understand my rights as a research subject, and I voluntarily consent to participate in this study. I understand what the study is about and how and why it is being done. I have been told I will receive a signed copy of this consent form.

_____   _____
Signature of Subject   Date

_____   _____
Signature of Witness   Date

For the Investigator or Designee:

I certify that I have reviewed the contents of this form with the person signing above, who, in my opinion, understood the explanation. I have explained the known benefits and risks of the research.

_____   _____
Signature of Principal Investigator   Date

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