2021

The Connection Between Pain, Perceived Disability, Emotional/Behavioral Problems, and Treatment Satisfaction

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Abstract

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Dissertation Prospectus Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

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Abstract

With more than 100 million Americans living in chronic pain (CP), there is a growing need for better and more effective pain management strategies. CP can result from an injury, disease, or an emotional or psychological issue. The purpose of this quantitative, nonexperimental study using a multiple linear regression procedure was to determine if CP patients' perception of their disability as measured by the Personality Assessment Screener (PAS) and their emotional and/or behavioral problems as measured by the Oswestry Disability Index predict their satisfaction with their pain management regimen as measured by the researcher-produced instrument Survey of Satisfaction with Pain Management Regimen (SSPMR). The theoretical framework underlying this study was Hochman et al.'s health belief model (HBM) revised in the context of Bandura's social cognitive theory by Rosenstock et al. The key research question inquired as to whether a CP patient's perceived disability with pain and emotional and behavioral problems predict the patient's satisfaction with their pain management regimen. A total of 80 individuals completed electronic surveys. The results revealed that the PAS element "acting out" was a statistically significant predictor of a patients' length of time with CP and that PAS element "health problems" was a statistically significant predictor of the degree to which a person's CP has changed their life. Age and gender have significantly predicted some of the PAS and SSPMR variables. The results of this study could promote positive social change by sharing professional insight to pain management physicians, thus, allowing them to create more effective pain management strategies.

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Dedication

I dedicate my dissertation to my parents James Arthur Drake and Charlotte Pollard Loposser. They taught me at a young age to never be afraid of change. This was first shown to me when they moved my two siblings and I to Saudi Arabia when I was 10 years old. My parents raised me to have an egalitarian viewpoint with spiritual and Christian values. I was blessed with the vast educational experiences of traveling around the world and taught immersion into multicultural experiences. I was also encouraged and molded to become independent, self-sufficient, and believing the sky is the limit if you want it/are willing to work for it.

I have been blessed with many family members, friends, mentors, supervisors, and coworkers who have encouraged me through my educational journey. Thus, working full-time, relationships, raising two children, life stressors, and breast cancer did not stop this journey.

Lastly, this dissertation is dedicated to those who were the pessimists to my optimism. Never tell someone they cannot do something or that they are not smart enough! This girl believed she could and did! Never be afraid or think it is too late to take a blank canvas and paint your future as bright as you can imagine.

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Chapter 1: Introduction to the Study

Gaining a deeper understanding of factors that contribute to experiences of pain and interfere with effective treatment among CP patients will help inform the development of alternative treatment perspectives to improve pain management. Improving CP management in any manner could be significant in improving patients' quality of life. One gap in the literature is the relative dearth of research linking mental and behavioral disorders to satisfaction with pain management. This chapter provides an overview of the background of CP, the purpose of this study, research questions, the theoretical framework for this research, definitions, assumptions, scope and delimitations, limitations, and the significance of the study.

The Problem

With more than 100 million Americans living in CP, there is a growing need for better and more effective pain management strategies (Reuben et al., 2015). Major contributors to CP are environmental and psychological factors that result in increased levels of pain, financial distress, or emotional or situational symptoms (e.g., depression and anxiety), and increased difficulty in managing these symptoms (McGrath, 1994; Roditi & Robinson, 2011). Smeets et al. (2008) correlated patients' expectations or initial beliefs regarding the success of pain treatment to treatment outcome, and their results showed the need to develop more effective methods of treating pain.

Background of the Study

CP is not uniquely an American issue but rather is the leading cause of disability globally (Disease and Injury Incidence and Prevalence Collaborators, 2016). Moreover, research suggests that more than 9.2 % of the global population is affected by disabling CP (Hoy et al., 2014; Vos et al., 2012).

Pain is an inherently unique experience for patients as the perception and tolerance of pain differs across individuals. The perception of pain goes beyond the biological intent of warning the patient that something harmful is happening. CP affects all aspects of a patient's life (i.e., physically, socially, financially, and emotionally). Melzack (1961) explained that pain is viewed through the lens of patients' past experiences, cultures, and expectations of how others should respond to their pain. A patient can perceive their pain as a part of their identity, or they can view it as a distinct separate entity (Jordan et al., 2018). An individual's pain level can impede their ability to function and affect their subjective sense of well-being.

CP is not only a common disabling issue, but it also poses great financial cost to the patient and society (DeBar et al., 2018). Research including patients with chronic low back pain reveal the estimated cost to employers in the billions of dollars resulting exclusively from loss of productivity, including recurring loss of workdays (Belfiore et al., 1996). Dahlhamer et al. (2018) and the Institute of Medicine (Osterwies, 2011) estimated medical costs for CP to exceed $560 billion for the general population of the United States.

CP can result from an injury, disease, or an emotional or psychological issue (Treede et al., 2019). It is one of the most common reasons for adults seeking medical attention (Dahlhamer, et al., 2018; Schappert & Burt, 2006). These common reported forms of CP include lower-back conditions, posttraumatic stress, osteoarthritis, postherpetic neuralgia, regional pain syndromes, and chronic headaches (Bennett, 1999). Furthermore, there are three identifiable types of pain: *Nociceptive, Neuropathic*, and *Psychogenic*.

Nociceptive pain is designed to protect the body (Nickel et al., 2012). Nociceptive pain is a basic response to noxious injury of tissue; nociceptors exist to signal the body that an injury of tissue damage or inflammation has (Hunt et al., 2019). Examples of this type of pain are somatic (e.g., from skin, muscles, etc.) or visceral (e.g., from internal organs) and are often the result of an injury or arthritis.

Neuropathic pain is a result of trauma, infection, or surgery to the peripheral and central nervous system; this form of pain can last long after an injury has healed (Alles & Smith, 2018; Costigan et al., 2009; Moulin et al., 2014). Nociceptive and neuropathic pain both stem from a sensitivity between the central nervous system and the brain (Toda, 2019; Woolf, 2011) explaining that these types of pain can coexist (Wu & Jarvi, 2018).

Psychogenic pain is diagnosed when all physical causes of pain are ruled out; it is also associated with psychological factors (Majone et al., 2018). This form of pain is less commonly the focus of pain management, as nociceptive and neuropathic are often looked at as the primary or secondary causes, respectively (Khan, 2019). Psychogenic pain has also been called idiopathic pain or nonsomatic pain, as these terms are interchangeable (McGeary, 2018; Malleson et al., 2001). Research has shown an association between personality disorders and somatic disorders as they are often considered a comorbid condition with pain (i.e., the simultaneous presence of two chronic diseases or conditions in a patient; Garcia-Campayo et al., 2007). Additionally, emotional, and behavioral distress have been found to be challenging aspects of managing CP due to the high rate of depression and anxiety among these patients (Roditi & Robinson, 2011). However, prior to developing CP, each patient has unique genotypes and prior learning histories that shape their perception of that pain and how they respond initially and move forward with that CP (Gatchel et al., 2007; Okifuji & Turk, 2015).

Purpose of the Study

The purpose of this quantitative, nonexperimental study was to determine if CP patients' perception of their disability and their emotional and/or behavioral problems (i.e., negative effects, acting out, health problems, psychotic functioning, social withdrawal, hostile control, suicidal thoughts, alienation, alcohol problems, anger control) would predict their satisfaction with their pain management regimen. The interaction between the unique physical, psychological, and social factors of each patient engaged in CP management must be considered comorbidly (Cedraschi et al., 2018).

As more CP patients have developed addiction issues from being treated with opioids, physicians are held to increasingly strict guidelines for prescribing medication for pain management (Mattingly, 2015). This has caused patients and physicians to seek alternative methods of pain management as doctors fear losing their licensure for unwarranted prescribing (Webster et al., 2019). In the quest for obtaining relief from their pain, CP patients become dissatisfied when physicians are incapable of providing relief. It has been reported that 79% of CP patients are dissatisfied with their pain management regimens due to their expectations of treatment (Geurts et al., 2017). Smeets et al. (2008)

correlated patients' expectations or initial beliefs regarding the success of pain treatment to treatment outcomes and found credibility with pain management was significantly associated with patient satisfaction and disability perceptions. Balaqué et al. (2012) suggested that for CP management to be effective, psychosocial issues should be considered in determining how a patient will respond to treatment. This could be due to the prevalence of emotional, behavioral, and personality disorders found among CP patients as compared to the general, medical, or psychiatric population (Weisberg, 2000). Weisberg and Keefe (1997) suggest that screening a CP patient for possible emotional, behavioral, and personality disorders could be helpful in treatment decisions. Clark (2009) and other researchers have found that psychiatric, emotional, behavioral, and personality factors increase the risk for CP (Murray et al., 2019). Research by Pavlin et al. (2005) further indicated psychological issues can significantly affect the experience of pain. Thus, as suggested by Dixon-Gordon et al. (2018), given the relationship of emotional, behavioral, and personality issues exacerbating health problems, further research on how treatment influences the rating and severity of chronic physical issues may be found beneficial.

Research Questions and Hypotheses

The research questions asked if a CP patient's perceived disability with pain and emotional and behavioral problems would predict satisfaction with their pain management regimen. The primary dependent (criterion) variable (DV) for this quantitative, nonexperimental study was respondents' perceived satisfaction with their current pain management regimen. Two primary independent (predictor) variables (IVs), the perceived disability with pain as measured by the Oswestry Disability Index (ODI) and emotional and behavioral factors as measured by the Personality Assessment Screener (PAS), were tested in the following hypotheses:

RQ1: Is perceived disability with pain a statistically significant predictor of satisfaction with current pain management regimen among CP Patients?

$H_0$1: A perceived disability with pain controlling for emotional and behavioral factors is not a statistically significant predictor of satisfaction with current pain management regimens among CP patients.

H_a1: A perceived disability with pain while controlling for emotional and behavioral factors is a statistically significant predictor of satisfaction with current pain management regimens among CP patients.

RQ2: Are emotional and behavioral problems a statistically significant predictor of satisfaction with current pain management regimen among CP patients?

$H_0$2: Emotional and behavioral problems controlling for perceived disability with pain are not a statistically significant predictor of satisfaction with current pain management regimens among CP patients.

H_a2: Emotional and behavioral problems while controlling for perceived disability with pain are a statistically significant predictor of satisfaction with current pain management regimens among CP patients.

Instruments

I used two assessment measures to collect data. These were the ODI and the PAS.

Oswestry Disability Index

The ODI was developed by J. O’Brien to assess how an individual's perception of their back pain affects their ability to manage everyday life (Fairbank & Pynsent, 2000). It reports different areas, including pain intensity, personal care, lifting, walking, sitting, standing, sleeping, social life, traveling, and changing degree of pain. It then places an individual in an overall range of their pain and dysfunction. The ODI has been noted as a reliable means of scoring a patient’s perception of disability (0 to 5) that is then calculated as a percentage, with a high score indicating a high level of disability (Little & MacDonald, 1994). This questionnaire has been shown to have excellent retest reliability (Fairbank et al., 1980).

Personality Assessment Screener

The PAS is derived from the Personality Assessment Inventory. It consists of a 22-item self-report measure of risk for emotional and behavioral dysfunction (Edens et al., 2019). The PAS was designed for use as a triage instrument in health care and mental health settings. The PAS provides a P-score representing a low, normal, or moderate probability of relevant clinical problems in 10 subscales elements of NA (Negative Affect), AO (Acting Out), HP (Health Problems), PF (Psychotic Features), SW (Social Withdrawal), HC (Hostile Control), ST (Suicidal Thinking), AN (Alienation), AP (Alcohol Problems), and AC (Anger Control; Morey, 1997). This is then used to identify the need for a follow-up visit with a psychologist. For example, a P-score of 48 indicates a 48% probability of problems in the specific area scored. The PAS was found to be significantly correlated with areas of psychological dysfunction where moderate (i.e., P-scores 40.0 to 49.9) or higher translated to evidence of a clinically significant emotional or behavioral dysfunction (Edens et al., 2018; Edens et al., 2019). The PAS scores effectively identified with clinically significant elevations from the Personality Assessment Inventory and met criterion measures for validity.

Theoretical Framework

The health belief model (HBM) was the theoretical framework underlying this study. The HBM was posited by Hochbaum et al. (1952) and revised in the context of Bandura's social cognitive theory's (SCT) use of self-efficacy by Rosenstock et al. (1988). The HBM is used to explain sociopsychological variables of preventive health behaviors and decision-making under uncertain conditions (Maiman & Becker, 1974). It was developed to help health organizations understand why people were not being screened for tuberculosis, and it had two major components of health behavior, threat and outcome expectations (Gehlert & Ward, 2019; Hochbaum, 1958; Rosenstock, 1960, 1966, 1974).

The HBM has been related to SCT as their key points show several similarities, for example expectancies of environmental cues or perceived threat (illness/pain), expectations about outcomes or perceived benefit or barriers, expectations about self-efficacy or implied within the perceived barriers, and incentive/health motive or value in reducing perceived threats (Leventhal et al., 1980; Maiman & Becker, 1974; Rosenstock et al., 1988). SCT expresses how a person is influenced by experiences, expectations, self-efficacy, observational learning, and reinforcements to achieve changes in behavior (Bandura, 1988). SCT is focused on observational learning and four other related components of learning (i.e., attentional processes, retention processes, motor reproduction processes, and motivational processes; Harinie et al., 2017). Although the HBM does not specifically address the relationship between expectations and self-efficacy, it is implied in the perceived barriers to action (Rosenstock et al., 1988). Self-efficacy beliefs determine how people think, feel, and are motivated into certain behaviors (Zimmerman, 2000). As pain is rooted in a person's perceptions, HBM integrated with self-efficacy can be a framework to understand how patients perceive benefits, threats, and cues to action, and how their self-efficacy plays a role in their treatment (Bishop et al., 2015). Integrating the two to create a revised theory could provide a better approach to understanding and influencing health-related behaviors (Rosenstock et al., 1988).

Nature of the Study

For this quantitative, nonexperimental, correlational research design I used a multiple linear regression to determine if the perceived level of disability with pain and emotional and behavioral factors would indicate a potential for a personality disorder and/or predict satisfaction with current pain management regimens among CP patients. I collected data through a convenience sampling of chronic low back pain patients. Sampling procedures are reviewed in Chapter 3: Methodology. The DV is the reported level of satisfaction with their pain management regimen. The primary IVs included the patient's perceived level of disability with pain and the patient's potential for emotional or behavioral problems.

Participants in the study were patients of various Texas pain management physicians undergoing mental health evaluations for surgical clearance to go through a spinal column stimulator (SCS) trial. The mental health evaluation for the SCS trial and implant provides surgical clearance by ensuring the patient has no psychological, emotional, or behavioral issues (e.g., emotional/behavioral distress, pain catastrophizing, history of trauma/abuse, poor social support, cognitive deficits, paranoia, personality disorders, or somatic disorders) that could be contraindicative of the procedure (Campbell et al., 2013). The evaluation must show a patient is able to understand the process, knows the potential risks or benefits associated with the procedure, and does not have any mood lability that could deleteriously affect the procedure. To determine a patient's clearance for the SCS evaluation, recipients undergo assessment measures that rate their pain level, rate their perceived level of dysfunction with pain, determine if there are any emotional and behavioral issues, and gauge their current mental health status. Two commonly used assessments for this are the ODI and the PAS. For this study, an additional questionnaire was added to measure participants' satisfaction with their current pain management regimen. CP patients often perceive they receive insufficient care because their pain management physicians lack empathy and investment in their treatment (Kenny, 2004).

Definitions

Emotional/psychological distress: A term for a patient's level of unpleasant feelings or emotions (e.g., anxiety, depression, general mood) that can affect physical or mental functioning (Temple et al., 2018).

Emotional status: A term used to identify a patient's current mental state or emotional experience as explained by the James-Lange theory of emotion that emotion is determined by the intensity of the arousal experienced, but the cognitive process of the situation determines what the emotions will be (Pace-Schott et al., 2019).

Psychosocial: A term created by psychologist E. Erikson that is used to explain a patient's psychological issues in the context of their social environment that is used to explain social patterns within an individual (Bruce, 2002; Kelsey et al., 1996; Munley, 1975).

Treatment satisfaction: A patient's reported perception of the process and outcomes of their treatment experience (Revicki 2004; Weaver et al., 1997).

Assumptions

I assumed that the subjects queried in this study were representative of patients suffering chronic low back pain and that they provided honest responses to the questions asked in the survey.

Scope and Delimitations

The scope of this study was limited to a convenience sample of patients from a single psychologist's office that receives referrals from pain management physicians throughout Texas. These referrals were for patients seeking surgical clearance for an SCS trial/implant. Each participant was an active pain management patient who was suffering lower back CP and was under the care of a pain management physician.

Limitations

This study had several limitations that should be considered. Firstly, this research relied on self-report measures and lacked randomness in patient selection. Additionally, these self-report measures (i.e., PAS and ODI) were completed a year ago, which could have changed the participants' perception of pain and their satisfaction with the pain management regimen, hindering the validity of the results. This is because the perception of pain and comorbid issues surrounding pain could have biased the data. For example, prior issues of dissatisfaction with pain management could have influenced a participant's current satisfaction with their current pain doctors and treatment. This study also included variables that could be related to other issues such as psychiatric/medical diagnoses or unrelated experiences. Furthermore, patients suffering CP could have been experiencing an aggravation of pain during the survey process. This could have contributed to alterations in the testing conditions, thereby threatening the validity of the data collected.

Significance of the Study

Pain management physicians and mental health care workers could possibly use the results of this correlational study to shape alternative methods of treatment that better address patient perceptions and personality issues that could interfere with effective pain management. Patients could benefit from physicians who are educated and aware of internal factors that hinder the effective treatment of CP. The results of this study could promote positive social change through the sharing of valuable professional insight so that more effective pain management strategies can be created. This is due to seeing if and/or how a patient’s levels of pain can be affected by other factors in their lives. Factors that were reviewed are perceived levels of dysfunction, negative affect, acting out, health problems, psychotic functioning, social withdrawal, hostile control, suicidal thoughts, alienation, alcohol problems, anger control, and the perceived connection patients have with their pain management physician.

Organization of the Study

This study was organized into five chapters. Chapter 1: Introduction introduces the problem of pain management, states the research question, identifies the significance of the study, and explains the research design used to answer the question. Chapter 2: Literature Review provides an overview of the background to the problem, supports the statements and inferences of the negative results of the problem, describes in detail the research framework for the study, and presents results of studies about the problem and their connection to the research question. Chapter 3: Methodology describes in detail the research method used, defines the variables and explains how they were measured, describes the data collection instruments, explains the statistical procedure used to analyze the data, defines the decision rule for determining the answer to the research questions, and discusses protection of human and animal subjects and the validation of results. Chapter 4: Findings presents the findings of this research in table and graphical format and narrative, including interpretation of the data. Chapter 5: Summary and Conclusions summarizes the findings from the research, states conclusions drawn from the research, provides a direct answer to the research questions, and discusses in detail the links to prior research and implications for the field of study.

Chapter Summary

Pain is unique to each patient as it is a perception-based problem. This was a quantitative, nonexperimental, correlational study using a multiple linear regression to determine to determine if CP patients' rating of their disability with pain and emotional and behavioral issues predicts their satisfaction with their pain management. I hoped the study may benefit pain management physicians and CP patients by helping them to be more aware of internal factors that could hinder treatment of CP. The framework for this study was the HBM posited by social psychologists in the 1950s (Rosenstock, 1974) but in the context of Bandura's SCT. This theory is used to explain sociopsychological variables of preventive health behaviors that describe behavior or decision-making under uncertain conditions.

Chapter 2: Literature Review

A major problem with CP is that it results in increased levels of pain and may result in financial distress, emotional or situational symptoms (e.g., depression and anxiety), and difficulty with pain management (McGrath, 1994; Roditi & Robinson, 2011). The purpose of this quantitative, nonexperimental study was to determine if CP patients' perception of their disability and their emotional and/or behavioral problems (i.e., negative effects, acting out, health problems, psychotic functioning, social withdrawal, hostile control, suicidal thoughts, alienation, alcohol problems, anger control) predicted their satisfaction with their pain management regimen. This chapter provides an overview of the literature regarding the problem, supports the statements and inferences of negative results of the problem, and presents the theoretical framework for the research question and the methodology.

Literature Search Strategy

For this literature review, I identified articles related to CP and pain management. These articles came from peer-reviewed, evidence-based literature. I searched articles through Google-Scholar and the Thoreau multidatabase search tool to obtain research articles published from 2016 through 2021. Key search terms were c*hronic pain, pain management, satisfaction with pain management, perception of pain,* and *emotional issues with chronic pain*. A comprehensive literature search revealed that existing research was limited to perception of pain level and perceived level of social support within pain management. However, there was an absence of literature relating to the perceived level of disability with pain and a patient's emotional and behavioral issues surrounding pain as they related to their satisfaction with pain management.

Theoretical Framework

The framework for this study was the HBM posited by Hochbaum et al. (1952) and revised in the context of Bandura's SCT by Rosenstock et al., (1988). The HBM is a theory that attempts to explain sociopsychological variables of preventative health behaviors or decision-making under uncertain conditions (Maiman & Becker, 1974). It was developed to assist health organizations in understanding why people were not being screened for tuberculosis, and it had two major components of health behavior, threat, and outcome expectations (Gehlert & Ward, 2019; Hochbaum, 1958; Rosenstock, 1960, 1966, 1974).

The HBM has been related to SCT as their key points show several similarities such as expectancies of environmental cues and perceived threat (illness or pain), expectations about outcomes/perceived benefit or barriers, expectations about self-efficacy/implied within the perceived barriers, and incentive/health motive or value in reducing perceived threats (Leventhal et al., 1980; Rosenstock et al., 1988). SCT expresses how a person is influenced by experiences, expectations, self-efficacy, observational learning, and reinforcements to achieve changes in behavior (Bandura, 1988). Bandura's theory is focused on observational learning and four other related components of learning, attentional processes, retention processes, motor reproduction processes, and motivational processes (Harinie et al., 2017). Although the HBM does not specifically state that it integrates expectations about self-efficacy, the influence of self-efficacy is implied in a person's perceived barriers to taking action regarding their health (Rosenstock et al., 1988). Self-efficacy beliefs determine how people think, feel, and are motivated into certain behaviors (Zimmerman, 2000). As pain is a perception-based issue, the HBM integrated with self-efficacy can be applied as a framework to understand how patients perceive benefits, threats, and cues to action, and how their self-efficacy plays a role in their treatment (Bishop, et al., 2015). Integrating self-efficacy could provide a better approach to understanding and influencing health-related behaviors (Rosenstock et al., 1988).

Past studies using the HBM have been used to understand and predict numerous behaviors relating to positive health outcomes, the results of which have been replicated successfully many times (Carpenter, 2010; Janz & Becker, 1984). Previous research by Bishop et al., (2015) used the HBM to provide evidence for showing an increased understanding of how perceptions of barriers, threats, and self-efficacy play an important role in safe health care. Another study by Guidry and Benotsch (2019) used the HBM to identify the attitude and level of knowledge of hospital staff on helping CP patients. Findings showed the group of nurses in the study felt inadequate in their knowledge of how to assist with helping cancer patients with their pain (Sehahnazi et al., (2012).

Literature Review Related to Key Variables and Concepts

CP is a worldwide issue that is disabling vast numbers of people (Hoy et al., 2014; Vos et al., 2012). CP has been defined as pain that persists beyond the normal healing time, and it is classified as CP when pain lasts longer than 3 months (Treede et al., 2015). In 1978, the International Association for the study of Pain was formed; they agreed upon defining pain as “An unpleasant sensory and emotional experience associated with actual or potential tissue damage” (Raja, et al., 2020). The experience of severe and ongoing pain causes degenerative changes in the patient’s nervous system; this will often intensify, prolong, and exacerbate the experience with pain (Aronoff, 2016). The result of this experience is CP.

Chronic Pain

Issues surrounding CP do not just affect the CP patient, but they also affect those who live with them and/or care for them. An estimated 50 million adult CP patients live in the United States. Most are female, worked previously but are now unemployed, are living at or near the poverty line, and reside in rural areas (Dahlhamer et al., 2018). There are even subcategories for pain: The International Classification of Diseases category for chronic pain contains the most common clinically relevant pain disorders and is divided into seven groups: (1) chronic primary pain; (2) chronic cancer pain; (3) chronic posttraumatic and postsurgical pain; (4) chronic neuropathic pain; (5) chronic headache and orofacial pain; (6) chronic visceral pain; and (7) chronic musculoskeletal pain (Treede et al., 2015). The Analgesic, Anesthetic, and Addiction Clinical Trial Translations Innovations Opportunities and Networks (ACTTION) in collaboration with the U.S. Food and Drug Administration and the American Pain Society (APS) have joined to develop a classification system that incorporates current knowledge of biopsychosocial mechanisms, called the ACTTION-APS Pain Taxonomy, an evidence-based taxonomy of pain for major CP conditions (Fillingim, et al., 2014). Turk et al.

(2016) and Williams (2013) observe that the ACTTION-APS Pain Taxonomy identifies the following psychological factors that should be considered when classifying a patient with CP: mood/affect, coping resources, expectations, sleep quality, physical function, and pain-related interference with daily activities.

Pain is not a medical condition that can necessarily be seen. For example, a pain sufferer can sometimes feel alone and unbelieved when it comes to expressing their level of pain. It has been stated that pain without visual or understood causes leaves patients with an impression that their pain experience is invisible, causing possible comorbid issues (Ojala et al, 2015). These comorbid issues are often medical and psychological.

Psychological Effects of Pain

As the CP patient becomes unable to function physically, they begin to be affected psychologically, which negatively influences all other areas of their lives. Then these resulting comorbid issues exacerbate the patient's experience with pain. Research has found that mood can influence a patient's perception of pain (Berna et al., 2010). A patient's mood or "affect" can be seen as their emotional status. Emotion regulation has been considered an escape response generated by the patient's avoidance of feelings evoked by some stimulus (Torre & Lieberman, 2018). CP patients who have poor emotion regulation often have difficulty with their pain management. A patient's negative mood, attitude, and behaviors can increase the perceived level of pain and psychological well-being negatively (Topcu, 2018). This shows the importance of positive thoughts on improving the perceived level of pain. However, it is often difficult for CP patients to avoid negative thinking when the pain intrudes into all areas and aspects of the patient's life. This is because maladaptive emotional responses such as the following become increasingly associated with their pain: (a) high emotionality; (b) negative mood; (c) depressive symptoms; (d) pain catastrophizing, an exaggerated negative mental mindset brought on by actual pain or anticipated pain (Flink et al., 2013; Sullivan et al., 2001); and (e) the impact of the pain (Koechlin et al., 2018).

This explains how chronic and debilitating pain can also lead patients to catastrophize their pain. Catastrophizing is found to be more persistent in older adults, and it will often produce feelings of helplessness (Bell et al., 2018). Sullivan et al. (1995) discussed pain catastrophizing and defined it as an exaggerated negative mental state during actual or anticipated pain. It was stated that a CP patient’s catastrophizing results in a high attention to pain, perceptions of threat, and expectations of heightened pain. Not all CP patients catastrophize their pain. However, some patients may catastrophize as a social approach to coping with their pain or to gain the support from others (Sullivan et al., 2001). It was found that pain severity cannot be assumed to measure only pain, but it also represents a patient’s perception and beliefs about their pain. Further research explained that perceptions of pain interference, pain catastrophizing, and disability beliefs can cloud a patient’s rating of their true level of pain (Jensen et al., 2017).

Psychological, behavioral, and emotional factors, (i.e., cognitive, emotional, and motivational) can significantly affect a patient’s pain level perception and outcomes of treatment (May et al., 2017). This was also found by Chisari and Chilcot (2017) who noted that psychological distress (e.g., depression and anxiety), illness perception, or patients’ feelings of treatment control, fatigue, and cognitive-behavioral factors (e.g., thoughts and behaviors) were associated with their perception of pain severity. Among these variables, catastrophizing was the only factor that could be a significant predictor of pain severity.

Perception of Pain

Pain perception is created by the integration of multisensory information and noxious stimuli such as psychological and emotional factors (Gallace & Bellan, 2018; Hamasaki et al., 2018). One study found that realizing the source of stress could help reduce a patient’s perception of pain severity (Nirit & Defrin, 2018). This was further found true by Hamasaki et al., (2018) where psychological factors influenced the perception of pain level, disability, and hindered treatment efforts.

As CP patients begin to experience more debilitating comorbidities of pain, the pain is seen to have taken away their income, independence, self-esteem, functionality, and sociality. Their poor physical functionality hinders their daily living ability. Difficulty with mobility and physical functioning is common among CP patients (Schepker et al., 2016). Physically managing a life with pain is more difficult when you add other medical or psychological health issues. Research has also shown a relationship between psychosocial factors of CP patients. Baert et al. (2017) found patients with psychosocial factors of pain, including catastrophizing and poor coping strategies, reported poorer physical functioning and difficulties with pain management. These factors often lead to a feeling of hopelessness, as they can no longer see a future without pain.

de Luca et al. (2017) noted that comorbid chronic diseases added to physiological and psychological pain with behavioral and social stresses increasing the problems of managing pain and functioning with the pain. Berna et al. (2010) further noted that CP is found more often with people who are diagnosed with depression. Williams (2013) reported CP can result in psychological factors that should not be confused with co-morbid psychiatric illnesses. Linton et al. (2018) further noted that confusion was likely due to the patient's medical and mental health issues becoming intertwined with their CP.

Depression and Anxiety

The inability to deal with CP can lead a patient to experience psychological issues with depression and anxiety. Depression itself has been said to produce disability and poor health-related quality of living as it increasingly exacerbates patients with chronic medical disorders such as CP (Schonfeld et al., (1997). Depression is characterized by the persistence of negative thoughts and emotions that disrupt mood, cognition, motivation, and behavior (Akil et al., 2018). Anxiety, according to the diagnostic guidelines, is an excessive worry that is difficult to control and can cause significant distress and impairment (American Psychological Association, 2018). Anxiety can often hinder a person's ability to work and function physically and socially (Beck et al., 1985; McLaughlin et al., 2006). It is common for CP patients to suffer both anxiety and depression due to these disorders being highly comorbid (Bishop & Gagne, 2018; Brown et al., 2001; Kessler et al., 2005; McLaughlin et al., 2006). The symptoms of depression and anxiety are found in, but not limited to, the inability to sleep, insufficient or excessive consumption of food, social isolation, and mental defeat. Research shows that depression and anxiety with CP are strongly associated with more severe pain, greater disability, and a poorer reported quality of life (Bair et al., 2008). The problem becomes more than the physical pain; it also includes the consequences of the pain, such as distress, loneliness, lost identity, and low quality of life (Ojala et al., 2014).

Consequences of Pain

The consequences of pain are wide-ranging. Sleeping, eating, breathing, and drinking water are accepted as being biologically necessary for human existence. Difficulty or inability to sleep is one consequence that can exacerbate a patient's ability to deal with pain. According to Grandner (2017), research has shown that the lack of sleep or poor-quality sleep has been associated with negative health issues. Magraw et al. (2015) suggest an important correlation between patients' capacity for dealing with pain and quality of life by finding pain was associated with psychologically, physically, and socially hindering patients daily functioning. Multiple sources report 50 to 88 percent of CP patients who seek medical assistance also complain about insomnia, but only 40 percent of patients suffering insomnia report having CP (Wei et al., 2018; Alfoldi et al., 2014; Tang, 2008; Taylor et al., 2007; Ohayon, 2005). One study reported that exposure to chronic insufficient sleep increases a person's vulnerability to CP (Simpson et al., 2018). Lerman et al. (2017) found improving a CP patient's experience with sleep reduced the level of pain catastrophizing.

Karos et al., (2018) reported pain as a social experience that can threaten a person socially in three ways: (1) it shifts control away from the person with pain to others, (2) it isolates, and (3) it is often associated with (perceived) injustice. Isolation can be a result of patients’ shame and frustration due to their inability to complete common daily activities (Bailly et al., (2015). These negative self-perceptions begin to change them socially. Isolation and loneliness become a factor, and patients begin to feel they are alone with their CP (Shankar et al., 2017). Hazeldine-Baker et al., (2018) reported that mental defeat (MD) among CP patients was linked to anxiety, pain interference, and functional disability. They found that mental defeat was different from other cognitive pain related issues such as depression, hopelessness, and catastrophizing.

Mental defeat in CP patients has been described as episodes of persistent and debilitating negative belief triggers about oneself in relation to pain. (Tang et al., 2007). Ehlers et al. (1998) defined MD as the perception of losing a person’s autonomy or giving up in a person’s mind. Tang, et al. (2010) suggest a significant correlation between MD and pain, inability to sleep, anxiety, depression, physical functioning, and psychosocial disability. They also found that poor physical functioning and distress were predictors of MD. Mental defeat, lack of sleep, depression, and anxiety are all further displayed when patients begin experiencing isolation and loneliness. Cacioppo et al. (2015) noted that social isolation is a major risk factor for morbidity and mortality in humans; it has also been found that social isolation can have a negative effect on neuroendocrine functioning. The neuroendocrine system is the mechanism that helps the human body maintain and regulate human brain function, neural development, and behavior (Martin, 2001). This information helps to explain the need for having or feeling social support.

Pain Management

Karayannis et al., (2017) state that a CP patient’s primary goal is to reduce the level of pain and improve his or her physical functioning. They suggest that patients will seek pain management when the pain becomes chronic. Feelings of frustration are often reported with pain management regimens because the methods of treatment are not alleviating the pain. At times patients go through surgical and nonsurgical procedures that leave them still dealing with CP.

The pain patient’s struggle with pain management is commensurate with the pain management physician’s efforts to safely manage a CP patient’s level of pain. Pain management regimens were once focused on opioid pain medication after surgical corrections or procedures were ruled out. Due to the increasing number of deaths from opioid abuse in the United States and the liability this brings, many pain physicians are now concerned about prescribing opioids for their patients. According to Seth et al. (2018), from 1999 to 2015, approximately 33,091 deaths occurred due to opioid overdoses; from 2014 to 2015 opioid deaths increased 63.1% due to the synthetic opioids like fentanyl. Opioid pain medication to manage CP became an added problem due to many patients becoming addicted to their source of pain relief. Many patients often begin self-managing their dosage and taking more medication because the prescribed dosage would lose some of its effect over time.

This has left CP patients struggling to deal with their pain. Patients often focus their frustration on their pain management regimen because it is not helping them lower their level of pain. Patients will often go from one doctor to another as they are looking for the one who will make everything better. The *New England Journal of Medicine* reported patients often realize, after the fact, they are victims of prescription addiction; however, patients were quoted as continuing to demand opioids because they will sue if they are left in pain (Lembke, 2012).

Pain Management Treatments

Two general forms of pain management are pharmacological/surgical and non-pharmacological/non-surgical. Pharmacological and surgical forms of treatment include but are not limited to medications, invasive procedures (i.e., surgery), minimally invasive (e.g., SCS), and injection therapy. Alternately, three examples of non-pharmacological/non-surgical forms of treatment are counseling with cognitive behavioral therapy (CBT), mindfulness counseling, and physical therapy or exercise.

Medications

Medications are commonly used to dull or hide pain. Commonly prescribed medications for CP include nonsteroidal anti-inflammatory drugs and Acetaminophen, antidepressants, anticonvulsants, muscle relaxers, topical analgesics, and opioids (Lin et.al., 2018).

Invasive Procedures

Examples of invasive surgical procedures for CP are discectomies, laminectomies, and fusions. Lumbar fusions for lower back pain have become one of the most used surgical procedures for degenerative disc issues (Phillips, 2013). Although some surgical procedures for CP have proven to reduce pain, the pain relief is known to diminish with time and will often worsen the patient’s quality of life up to 4 or 5 years following surgery (DeBerard et al., 2001). Many patients are further diagnosed with failed back surgery syndrome due to new, recurrent, or persistent pain following surgery (Rigoard et al., 2019).

Minimally Invasive Procedure

Managing pain has turned to the increasing use of the minimally invasive SCS for the reduction of pain. The SCS was first used in 1967, using pulsed energy near the spinal cord to control pain (Burton, 2007). Over fifty years later, the SCS now gives patients multiple options of capability; these differences are in the vast range of ability, tonic or burst patterns of stimulation, and a current that can be focused on specific dermatomes (areas of skin mainly supplied by afferent (conducting) nerve fibers) in a single limb (Stricsek & Falowski, 2019).

Injection Therapy

Injections for pain are one of the most commonly performed procedures for CP (Center & Manchikanti, 2016). Epidural injections have been used since 1901 to help manage low back pain, and research has shown the efficacy of their use (Kaye, et al., 2015). Research shows epidural injections are often considered a good option treating pain for those who are not good surgical candidates (John & Hodgden, 2019).

Cognitive Behavioral Therapy

CBT for the treatment of CP helps patients alter their individual responses to pain; therefore, reducing the pain, disability, and suffering (Keefe et al., 2004; McCracken et al., 2007). This form of treatment, aka counseling, encourages the pain patient to not accept negative thought patterns and to question them. Psychological counseling for CP has been found in research to be an effective method of significantly improving pain and patients' quality of life (Oliveira & Dos, 2019).

An example of using CBT can be seen when helping a patient with their sense of self-efficacy. It has been noted that patients who have self-efficacy have better outcomes with managing their pain (Chester et al, 2019). Self-efficacy is a patient's ability to perceive they can organize and execute a plan of action to achieve a goal (Bandura, 1997; Bandura, 1977). People with high levels of self-efficacy set higher goals, put forth more effort, show determination, and persist longer with challenges (Schunk &Usher, 2012). Research shows a positive, high correlational value with CP and self-efficacy; those who have better self-efficacy have shown to have greater pain tolerance (Council & Follick, 1988; Keefe et al., 1997). Furthermore, those CP patients receiving counseling, in a study by All et al. (2017), experienced fewer issues with their perceived quality of life than those who did not have treatment.

Mindfulness Counseling

J. Kabat-Zinn (2005) developed the use of mindfulness in psychology and was the first to study the connection between mindfulness and pain. The results showed the benefits of mindfulness as an effective treatment for pain; results showed significant reductions in pain, negative body image, inactivity due to pain, mood disturbance, psychological symptomology, including anxiety and depression (Kabat-Zinn, 2005; Senders et al., 2018). Further research also found mindfulness is a preventive factor against depression, due to depression being a psychological risk factor for CP patients

(Brooks et al., 2018). Researchers at Wake Forest Baptist Medical Center found that the brains of meditators using mindfulness respond differently to pain (Zeidan, 2015). Mindfulness has been described as paying attention, in a particular manner, on purpose, in the present moment, and without judgment; this encourages the letting go of defenses, resistance, and protection against pain and a move toward acceptance and peace (Sender et al., 2018).

Physical Therapy and/or Exercise

Physical therapy uses physical activity (e.g., exercise) to help CP patients better manage their pain. For most patients in pain, the main goal of participating in exercise is to reduce pain (Ambrose & Golightly, 2015). This is seen in many patients being sent to physical therapy (i.e., treatment using exercise). Research on the benefit of physical therapy showed a 50% decrease in patients' pain and disability (Denninger et al., 2018). Physical inactivity itself has been found detrimental to health, physical functioning, and health-related quality of life (Dunlop et al., 2015; Hills et al., 2015). Exercise (i.e., activity requiring physical effort) has been well documented as a preventive strategy against many chronic medical conditions; exercise can reduce the risk of some health issues by 20 to 30% (Warburton & Bredin, 2016). Patients who improve their lumbar flexibility can often reduce their back pain, thereby helping them with movement (Gasibat et al., 2017). However, many patients suffering CP can no longer lead physical lives due to their pain severity with movement. Alternately, physical activity or exercise has been found to be well supported as benefiting CP, physical functioning, sleep, cognitive functioning, and overall health (Ambrose & Golightly, 2015; Busch et al., 2013; Kelley et al., 2010).

Strategies for Coping with Chronic Pain

Haythornthwaite et al. (1998) studied the perceptions of control over pain and specific coping strategies. They found, regardless of pain severity, the use of cognitive pain coping strategies improved pain management. The specific coping strategies found to be most significant were coping self-statements; this was found to be an important part of cognitive behavioral intervention for CP management. Research has also shown a relationship between psychosocial factors of CP patients; they found patients with psychosocial factors of pain including catastrophizing and poor coping strategies reported poorer physical functioning and difficulties with pain management (Baert et al., 2017). A review of existing literature pertaining to coping strategies (skills and styles), illness belief, illness perception, self-efficacy, and pain behavior found that only illness belief and perception were common among CP patients (Hamilton et al., 2017).

Research on cognitive and behavioral pain coping strategies with CP patients found three factors, accounting for a large proportion of variance in responses, were (1) cognitive coping/suppression, (2) helplessness, and (3) diverting attention and or praying. This research found coping strategies often predicted a patient’s status of disability, length of continuous pain, and the number of surgeries they went through (Rosenstiel & Keefe, 1983). A study by Francis et al. (1990) examined the effects of age and coping strategies when dealing with CP and found that patients who possessed adaptive coping abilities often measured their pain as lower than those who had poorer coping skills and that there was no significant age difference to indicate effective pain coping strategies.

Coping Skills

Giving patients coping skills to deal with their pain emotionally can enable patients to become active participants in the management of their pain (Roditi & Robinson, 2011). Effective coping skills have been found by research to be associated with successful pain management; these active coping skills are listed as diverting attention, reinterpreting pain sensations, coping self-statements, ignoring pain sensations, increasing activity level, and increasing pain behaviors. Of these coping skills, diverting attention, ignoring the pain, and increasing activity were noted as most important at improving pain management (Emmert et al., 2017). A communal coping theory for CP patients was presented by Helgeson et al., (2018) that demonstrated evidence of improved health behaviors, physical health, and enhanced psychological well-being when there was a collaboration toward a common goal of improving the health of the patient.

Expectancy in CP treatment outcomes can enhance or reduce a patient’s treatment (Aslaksen et al., 2015; Kam-Hansen et al., 2014; Peerdeman et al., 2016). A study by Dawson et al. (2002) showed patients’ expectations are shaped, in part, through the quality of the provider relationship; the factors that affected patient satisfaction with their pain management included: (1) was the patient told that treating their pain was an important goal; (2) did the patient report sustained long-term pain relief; and (3) to what degree was the patient willing to take opioids if prescribed. Patient satisfaction and expectations both play a role in the adherence to treatment and contribute to the therapeutic alliance between the patient and physician (Walsh et al., 2019).

The perception and expectations of CP patients may mean they need support groups as a possible tool for developing coping strategies and improving the perception of the quality of life (Vaske et al., 2017). Understanding the psychological processes that underlie CP was found to improve treatment interventions (Linton et al., 2018). Becker et al. (2017) identified facilitators to effective management to include physical therapy, cognitive behavioral therapy, chiropractic treatment, mindfulness-based stress reduction, and yoga, as well as barriers including patient-provider interaction, high cost of treatment, transportation issues, and low motivation.

Chapter Summary

CP patient’s perception of their disability with pain, their emotional and behavioral issues, and their satisfaction with pain management are issues that contribute to effective pain management. According to research, treatment satisfaction among CP patients was most strongly predicted when they appraised their initial evaluation as thorough, had a comprehensive understanding of the clinic’s procedures, and experienced an improvement in their daily functioning (McCracken et al., 2002). Vranceanu et al., (2011) found a small but significant positive correlation between depression and the perception of how well the doctor listened and explained procedures; these authors also identified a relationship between a patient’s pain catastrophizing and the perception that the doctor provided sufficient information about procedures. Taken together, the current research supports a connection between a patient’s view of their pain management treatment and their ability to function with their pain.

This is a quantitative study that used a multiple regression to determine if perceived level of disability with pain and emotional/behavioral issues can predict satisfaction with current pain management regimens among CP patients. The primary DV is the satisfaction with pain treatment as measured by a Likert scale survey of patients. The primary IVs is the perceived level of disability with pain and emotional/behavioral issues.

Chapter 3: Research Method

Introduction

In this chapter, I describe the research design and method used, define the variables and how they were measured, describe the data collection instruments, explain the statistical procedure used to analyze the data, and define the decision rule for determining the answer to the research questions. Further, I provide the measures taken to ensure the protection of the patients' rights. This research was an exploration of whether the perceived disability with pain, as well as emotional and behavioral factors, predict satisfaction with current pain management regimen.

Research Design and Rationale

This is a quantitative, nonexperimental, correlational study to determine if CP patients' perception rating of their disability (IV1) and their emotional and/or behavioral problems (i.e., negative effects, acting out, health problems, psychotic functioning, social withdrawal, hostile control, suicidal thoughts, alienation, alcohol problems, anger control), which was IV2, predict their satisfaction with their pain management regimen (DV). Perception of disability of pain (IV1) was measured by the ODI. Perception of emotional and behavioral problems was measured by the PAS. The main purpose of a quantitative study is to determine if an IV has a statistically significant relationship with a DV, as opposed to a qualitative design that only seeks to identify or define variables and not to measure them (Hamby, 2019). To measure the patient's satisfaction with pain management, I used a survey with a quantitative Likert Scale to ask the CP patients in this study questions about their perception and satisfaction with their pain management physician.

The perceived level of dysfunction and disability with pain as measured by the ODI is thought to be a predictor of satisfaction with pain management. I applied the HBM to better understand patient adherence to their pain medication/treatment, as it was designed to predict treatment barriers (Butow & Sharp, 2013). Therefore, I used the HBM to assess how CP patients cope with their level of pain and pain management regimen. According to the HBM, people seek and follow a treatment regimen under the following conditions: (a) they view themselves as having CP (perceived susceptibility), (b) they view their pain as having severe repercussions (perceived severity), (c) they believe their treatment directives will reduce pain or its repercussions (perceived barriers), (d) they are cued by an external source to use coping strategies (cues to action), and (e) they believe in their ability to use coping strategies to improve their pain (self-efficacy; Jensen et al., 2003). This model posits that treatment is more likely to be followed if the patient feels the benefits outweigh the cost. If the cost is too great, the patient will be less likely to adhere to their pain management regimen.

From 1974 through 1984, a critical review was completed on the HBM’s performance. It found the most powerful predictor of health behavior was perceived barriers to treatment and the perception of severity was the least powerful predictor (Champion & Skinner, 2008; Janz & Becker, 1984). Previous research with the HBM model showed evidence of nonadherence with medication and pain management interventions (Butow & Sharpe, 2013). Barclay et al., (2007) studied the ability of the HBM to predict medication adherence among HIV-positive patients. The study revealed lower perception of support from family and friends, weak adherence to or greater perceived barriers to treatment, association with poor medication adherence, and lower levels of treatment adherence self-efficacy.

According to Glowacki (2015), a patient who perceives experiencing effective CP management is more likely to experience increased satisfaction with their treatment regimen and have overall positive treatment outcomes. However, patients who cannot achieve pain relief will often place the blame on their treatment. For example, it has been found that a patient can experience a successful surgical procedure for their pain issue, yet they will continue to have relevant functional impairments or pain; this can add to a patient's unhappiness with classifying their procedure or treatment as unsuccessful (Impellizzeri et al., 2012).

According to research, treatment satisfaction among CP patients was most strongly predicted by appraising their initial evaluation as thorough, having a comprehensive understanding of the clinic's procedures, and experiencing an improvement in their daily functioning (McCracken et al., 2002). Vranceanu & Ring (2011) found a small but significant positive correlation between depression and the perception of how well the doctor listened and explained procedures. The authors also identified a relationship between a patient's pain catastrophizing and the perception that the doctor provided sufficient information about procedures. Taken together, the current research supports a connection between a patient’s view of their pain management treatment and their ability to function with their pain.

Methodology

Following is a detailed description of the population, procedures for sampling, recruitment, participation, and data collection and instrumentation.

Population

The population at large for this study was people suffering from chronic lower back pain. Participants were CP patients who were experiencing lower back pain and being seen by a pain management physician, were 18 years of age or older, and were living in the United States.

Sampling and Sampling Procedures

The sample was a convenience sample of CP patients referred to a psychologist for psychological screening for surgical clearance for an SCS trial or implant procedure. This study and the SCS trial/implant were not connected. However, the psychological evaluations (i.e., clinical interview and assessment measures) obtained for the SCS clearance were used to provide data for the study. The patients’ participation was voluntary, and they were advised of their ability to opt out of this study at any time. Subjects received and gave informed consent and were not coerced to participate. Each patient who completed the survey was given their choice of a gift card as a thank you for their participation.

I calculated on a priori sample size of 76 for a statistical power of 0.80 from Free Statistics Calculators (https://www.danielsoper.com/statcalc/calculator.aspx?id=1) for a multiple linear regression with two predictors based on a medium effect size of 0.15 (Cohen, 1988), and an alpha level of 0.05.

Procedures for Recruitment, Participation, and Data Collection

Participants were entirely from CP patients who had been screened for surgical clearance for an SCS trial or implant procedure and completed the evaluation with Carewright Clinical Services. Part of their screening was the completion of the ODI and PAS, and the data from those measures were used for this study. A survey on pain management was also created to measure the participants satisfaction with their pain management.

Protection of participants' well-being and identity is paramount (see Ethical Procedures section). Carewright sent all potential participants a flyer explaining the research study along with participation numbers. The use of participation numbers ensured confidentiality of the patients. Patients volunteering for this study were given a letter of informed consent explaining the nature of the study, the nature of the data collection, instruments, possible risks, potential benefits, compensation policy, voluntary participation, guarantee of anonymity, opt out policy, and contact information for redress or questions. This informed consent was the first page of the survey. Subjects who consented to participate acknowledged so by clicking "yes" before being permitted to start the online survey (see Appendix A: Survey of Satisfaction with Pain Management Regimen).

Instrumentation and Operationalization of Constructs

Data was collected from three sources: (a) the ODI, (b) the PAS, and (c) the SSPMR. Carewright connected patient participation numbers with their completed survey, their existing data scores (i.e., ODI and PAS scores), and the patient's age and sex. This information was then provided to me to maintain patient confidentiality.

Oswestry Disability Index

The ODI was developed by J. O'Brien to assess how an individual's perception of their back pain affects their ability to manage everyday life (Fairbank & Pynsent, 2000). The ODI has been noted as a reliable means of scoring a patient's perception of disability (0 to 5) that is then calculated as a percentage, with a high score indicating a high level of disability (Little & MacDonald, 1994). This questionnaire has been shown to have excellent retest reliability (Fairbank et al., 1980). The subjects in this study were CP patients who had been screened for surgical clearance for an SCS trial or implant procedure. As part of the screening process, the patient completed the ODI and received scores for this self-report measure. Thus, all the participants in this study had already completed the ODI and gave consent to the use their scores for this study.

Personality Assessment Screener

The PAS is derived from the Personality Assessment Inventory. It consists of a 22-item self-report measure of risk for emotional and behavioral dysfunction (Edens et al., 2019). The PAS is broken into 10 subscale elements of NA (Negative Affect), AO (Acting Out), HP (Health Problems), PF (Psychotic Features), SW (Social Withdrawal), HC (Hostile Control), ST (Suicidal Thinking), AN (Alienation), AP (Alcohol Problems), and AC (Anger Control) (Morey, 1997). The term “personality” is somewhat misleading as, according to Morey (2007), the elements are intended to represent “constructs most relevant to a broad-based assessment of mental disorders”. The PAS is designed for use as a triage instrument in health care and mental health settings. For each element, a P-score representing a “low”, “normal”, “moderate,” or “high” probability of relevant clinical problems is derived. This is then used to identify the need for a follow-up visit with a psychologist. For example, a P-score 48 in one of the 10 elements indicates a 48 percent probability of problems in that specific element scored. There is no overall P-score encompassing all 10 elements. The PAS was found to be significantly correlated with areas of psychological dysfunction where “moderate” (i.e., P-scores 40.0 to 49.9) or higher translated to evidence of a clinically significant emotional or behavioral dysfunction (Edens et al., 2018; Edens et al., 2019). The PAS scores effectively identified with clinically significant elevations from the Personality Assessment Inventory and met criterion measures for validity. Like the ODI, part of the screening process includes completion and scoring of the PAS. Thus, all participants in this study will already have completed the PAS and gave consent to the use of those scores for this study.

Survey of Satisfaction with Pain Management Regimen

The SSPMR is an instrument developed for this study based on other in-use instruments and consists of seven Likert scale items asking the respondent to indicate his or her level of satisfaction with treatment, level of the importance of specific elements of the treatment, and how many physicians and treatment programs the patient has seen (see

Appendix A: Survey of Satisfaction with Pain Management Regimen). The Likert scale that was used is a 5-point scale that ranges from strongly disagree (1) up to strongly agree (5) showing the intensity and strength of the participants' responses.

Potential participants were sent an email link on a survey flier to complete the SSPMR survey by Carewright Clinical Services. Each patient was given a participation number on the email and flier instead of their name to ensure confidentiality. Personal identifying data to include name, address, or phone number were not collected or requested. After the participant completed the 5-minute survey on SurveyMonkey, the patient had the option to go to a link to get a $20 gift card of their choice as a thank you for their participation. Carewright sent the scores from the ODI and PAS along with the patient's age and sex to the researcher. The ODI and PAS scores were from the patient's previous psychological surgical clearance evaluations for the SCS trial/implant procedure. The flier and page one of the surveys explained to the patients that their participation was entirely voluntary and would not affect further treatment. Before the survey can move forward/begin on SurveyMonkey, the patient had to choose to click yes that had read the informed consent notice, agreed to participate, and were willing sharing their previous data from Carewright with the researcher.

Basis for Development. The SSPMR is based on a review of other satisfaction instruments used in the medical and consumer industries and is oriented specifically toward CP sufferers. According to Bhat (n.d.), (sales manager for Question Pro Inc. that specializes in online survey software), there are six underlying metrics of patient satisfaction: quality of medical care, interpersonal skills displayed by medical professionals, transparency and communication between care provider and patient, financial aspects of care, access to doctors and other medical professional, and accessibility of care. Baht further stated that under the Health Insurance Portability and Accountability Act (HIPAA) privacy regulations, by which medical care providers collect patient health information are bound, medical institutions are allowed to conduct surveys to assess the quality of patient care. Baht (n.d.) lists four exemplary questions for a patient satisfaction survey:

- "Based on your complete experience with our medical care facility, how likely are you to recommend us to a friend or colleague?
- Did you have any issues arranging an appointment?
- How would you rate the professionalism of our staff?
- Are you currently covered under a health insurance plan?" (Baht, n.d.)

Sufficiency of the SSPMR to Answer the Research Question. The instrument consists of seven questions (see Appendix A: Survey of Satisfaction with Pain Management) using a Likert scale to ask respondents to indicate their perception of the degree to which several aspects of pain management are satisfying to them.

Evidence of Reliability and Validity. Likert scales have commonly been used for satisfaction surveys. A particular example of its use in patient satisfaction is Laschinger et al., (2005) who tested a newly developed, patient-centered survey of patient satisfaction with nursing care quality in 14 hospitals in Canada revealing that the survey had excellent psychometric properties. Total scores on satisfaction with nursing care were strongly related to overall satisfaction with the quality of care received during hospitalization.

Hamby (2019) stated that a primary reason for developing an original instrument is to "provide a better congruency of the instrument to your particular study population." (p. 86) and advises a review must be made of each item on the instrument for context and semantic consistency with the population under study. Based on other satisfaction surveys, the question items on the SSPMR were informally reviewed to ensure the language and terminology of each item and was appropriate to the education level and cultural background of the target population and sample. The SSPMR was tested for reliability post-hoc using Cronbach's Alpha reliability procedure and factor analysis using SPSS version 21. This was done to provide insight into construct validity, that is, how well the survey items represent the construct being researched, based on correlations between responses.

Data Analysis Plan

The research question is do a CP patient's perceived disability with pain and emotional and behavioral problems predict the patient's satisfaction with his or her pain management regimen. The primary dependent (criterion) variable for this quantitative, non-experimental study was do the respondents' perceived satisfaction with their current pain management regimen. Two primary independent (predictor) variables were if the perceived disability with pain (as measured by the ODI) and emotional and behavioral factors (as measured by the PAS). Data was transcribed onto MS Excel spreadsheet and entered into SPSS for a multiple regression procedure.

Statistical Hypotheses

As this was a multiple linear regression, the most appropriate statistic to interpret for answering the research question is the effect coefficient B (also known as the slope) of the predictor variable. Therefore, the following statistical hypotheses were tested:

RQ1: Is perceived disability with pain, controlling for emotional and behavioral problems, a statistically significant predictor of satisfaction with current pain management regimen among CP Patients?

$H_0$1: A perceived disability with pain is not a statistically significant predictor of satisfaction with current pain management regimens among CP patients.

H_a1: A perceived disability with pain is a statistically significant predictor of satisfaction with current pain management regimens among CP patients.

RQ2: Are emotional and behavioral problems, controlling for perceived disability with pain, a statistically significant predictor of satisfaction with current pain management regimen among CP patients?

$H_0$2: Emotional and behavioral problems are not a statistically significant predictor of satisfaction with current pain management regimens among CP patients.

H_a2: Emotional and behavioral problems are a statistically significant predictor of satisfaction with current pain management regimens among CP patients.

Statistical tests were at the alpha = .05 (95% confidence level), a commonly accepted level for rejection of the null hypotheses in social and non-experimental studies.

Threats to Validity

Research has shown the ODI questionnaire has excellent re-test reliability (Fairbank et al., 1980). Further studies using the PAS self-report measure have reported evidence that the assessment meets criterion measures for validity (Edens et al., 2018; Edens et al., 2019). A review of existing literature pertaining to coping strategies (skills and styles), illness belief, illness perception, self-efficacy, and pain behavior found only illness as a commonality among CP patients (Hamilton et al., 2017). de Luca et al. (2017) noted that comorbid chronic diseases added to physiological and psychological pain with behavioral and social stresses increasing the problems of managing pain and functioning with the pain. Barclay et al. (2007) revealed the lower a person’s perception of family or friend support the predicted their adherence and perception of barriers to their pain management.

External Validity

External validity is the extent to which the results of a study can be generalized to the population at large. The population at large for this study was the population of people suffering from CP. As the sample was limited to CP patients in a small geographic region, it was anticipated that there were probably differences between geographic regions in pain management regimens and cultures throughout the world. In this regard, this study could not mitigate this threat but can recommend further research to account for a wider population.

Internal Validity

Internal validity is the extent to which a survey or experiment measures what it was intended to measure. This study used three surveys to measure perceived disability with pain (ODI), emotional and behavioral problems (PAS), and satisfaction with pain management regimen (SSPMR). Following are descriptions of the major threats to the internal validity of these measures and their potential of occurrence:

- Statistical regression: The effects of extreme scores or responses on the overall mean of the regression that could bias the true distribution. This threat was evaluated by an analysis of the regression plots and tests of significance in the regression model to determine if the results are robust. If results indicate too much bias, the regression could be rerun using weighting techniques of the variables. Evaluation indicated a negligible effect on the regression results (see Chapter 4: Findings).
- Interactive effects of the variables: Changes in the DV that may be ascribed to other variables or factors not being measured that tend to increase variance and introduce bias. The variables cannot be altered but their potential interactive effect can be evaluated with other statistics including the variance inflation factor and tests for collinearity.

- Instrumentation: Changes in results if the testing procedure or instrument is changed or modified. This threat was limited due to the survey being obtained from emailed fliers with a link to the survey. The participant chose whether to participate and then either completed the questions by clicking their choice of response or exiting the survey (see Appendix A: SSPMR). The survey is the same for each participant, but the validity could be affected if patients had difficulty with severe pain while taking the survey causing them to have difficulty concentrating.
- History: The effect of historical events, such as the Corona Virus Pandemic or an accident, on the participant's perception of pain or emotional status. The main threat was the validity of correlation between the patient's ODI and PAS scores and their responses to the satisfaction with their pain management. This was an unavoidable validity issue. A patient's success or failure with their pain management (e.g., SCS trial/implant procedure) could possibly influence their satisfaction with their pain management physician. Due to using pre-existing data from patient evaluations for the ODI and PAS, the scores from their survey of satisfaction with pain management could be affected positively or negatively.
- Maturation: Physical, developmental, emotional, or mental changes in the participant over the duration of the study. Up to 1 year had passed between the patients completing their PAS and ODI measures for Carewright. This should be taken into account when looking at results.

- Attrition: Changes in results if subjects drop out before completion of the study. This usually is important in experimental studies. As this is not an experimental study and the subjects will be measured only once, the threat of attrition will not be a consideration.
- Repeated testing: potential improvement or changes in a subject's performance when tested repeatedly. As the subjects will be surveyed only once, this will not present a threat to internal validity.

Construct Validity

Construct validity is the degree to which a test measures what it claims, or purports, to be measuring. The ODI and PAS have been sufficiently validated (see heading Instrumentation and Operationalization of Constructs). The SSPMR was validated using Cronbach's Alpha test of reliability post-hoc and was found to be robust (see Chapter 4: Findings).

Ethical Procedures

Protection of the participants' well-being and identity is/was paramount. To ensure the participants' confidentiality, participation numbers were given by Carewright to potential patients. This was done by sending out fliers via patient email addresses and asking the patient to participate in this research study. The participation number was linked to the patient's previous ODI and PAS scores by Carewright. They forwarded the scores along with the patient's age and sex to the researcher. Each patient was prompted on the survey link to click yes if after reading the informed consent letter they agreed to participate in the study. The informed consent included:

- Nature of the Study: The respondent was told that the purpose of this study is to identify correlations between CP sufferer's perception of their disability and their emotional or behavioral issues and their satisfaction with their pain management regimen. Participation required completion of a 5-minute survey through SurveyMonkey and permission to use the results of their gender, age, ODI scores, and PAS scores. The participant was advised the study is not associated, sponsored, or endorsed by any of their medical providers, physicians, or programs.
- Risks and Benefits of Being in the Study: The participant was told their participation in this study may involve minor emotional discomfort such as becoming upset from memories regarding your physical or emotional condition. Participation in this study should not pose any physical risk to your safety or wellbeing. Emotional or mental support is/was available by calling contact numbers provided.
- Payment/compensation**:** There was no monetary compensation for participation in this study. However, all participants received a link to receive a $20 gift card of their choice. Completion of this study is anticipated to be by October 2021, and results may be posted and viewed on the website view the overall results of the study by visiting www.carewright.org.
- Privacy: Participants were told that this study is/was voluntary, and they were free to accept or turn down the invitation. Additionally, if they decided not to participate, no one would know as participation is/was confidential. If, at any

time following their participation, they decide to withdraw from the study, the participant need only inform the researcher and all data will deleted from all records of the study. Participant's name, address, and any other personally identifying information was not obtained or recorded. Access to patient data, participation numbers, and their responses were/are password protected. No one at any institution or agency will have knowledge of any participant's name or who specifically participated in this study to be connected to participant responses. All information provided will be kept confidential. Only summary data will be presented in the final report – no individual data will be presented. Data (i.e., responses from the surveys) will be kept secure by me for a period of five years, as required by the university.

- Contacts and questions**:** Participants were advised on the emailed flier and informed consent that they may contact me for any questions or concerns by calling my provided phone number.

Chapter Summary

This was a quantitative, nonexperimental, correlational study to determine if CP patients' perception rating of their disability (IV1) and their emotional and/or behavioral problems (i.e., negative effects, acting out, health problems, psychotic functioning, social withdrawal, hostile control, suicidal thoughts, alienation, alcohol problems, anger control) (IV2) predict their satisfaction with their pain management regimen (DV). Perception of disability of pain (IV1) was measured by the ODI instrument. Perception of emotional and behavioral problems was measured by the PAS. These assessment instruments were found to have acceptable validation scores. Major threats to validity of this study include statistical regression, interactive effects of variables, instrumentation, and history. Other threats have been found to be negligible. Participants were CP patients who have been screened for surgical psychological clearance for an SCS trial or implant procedure, 18 years of age or older, and living in the United States. Minimum sample for robust results of the regression procedure is 76.

Chapter Four: Findings present statistical results of the multiple regression, discussion of the assumptions of the regression, and interpretation of the results.

Chapter 4: Findings

Chapter Overview

The purpose of this quantitative, nonexperimental study was to answer the following research questions:

RQ1: Is perceived disability with pain a statistically significant predictor of satisfaction with current pain management regimen among CP Patients?

RQ2: Are emotional and behavioral problems a statistically significant predictor of satisfaction with current pain management regimen among CP patients?

This chapter presents the findings of the tests of the hypotheses to answer the research questions. The primary dependent (criterion) variable for this quantitative, nonexperimental study was respondents' perceived satisfaction with their current pain management regimen as measured by the SSPMR. Two primary independent (predictor) variables were the perceived disability with pain as measured by the ODI and emotional and behavioral factors measured by the PAS. This chapter presents a description of the sample and a statistical analysis and hypothesis testing, along with an evaluation of the assumptions of linear regression and reliability of the SSPMR instrument, statistical conclusions of the hypotheses tests, and a narrative summary of the results.

Description of the Sample

The data were obtained from participants through administration of a paper-based version of the PAS, ODI, and the researcher-created SSPMR (Appendix A: Survey of Satisfaction with Pain Management Regimen). The SSPMR included questions to collect data to measure the subject's duration of living with CP, the extent of the pain, and the perception of satisfaction with their pain management regimen. Gender and age were the only demographic data collected and were recorded by Carewright while administering the PAS and ODI instruments during screening for the SCS procedure. Table 1 depicts a total sample size of 80. The proportion was about two-thirds male (63.75%) and one-third female (36.25%). The ages of the participants averaged 61.1 years and ranged from 21 years to 88 years old.

Table 1

Summary of Sample Demographics

Total participants in the sample – 80
GENDER Male = 29 (36.25%), Female = 51 (63.75%)
AGE Average – 61.1 Max – 88 Min – 21

Statistical Analysis and Hypothesis Testing

I used a multiple linear regression to test the hypotheses and conducted a post-hoc test for reliability of the SSPMR using Cronbach’s alpha. Following is a detailed description of tests of regression assumptions, a detailed description of the tests of the hypotheses, and a description of the results of the post-hoc test on Cronbach’s reliability.

Linear Regression Assumptions and Survey of Satisfaction with Pain Management Regimen Reliability

Certain assumptions regarding linear regression must be met for results to be robust. Eight key assumptions are:

- Assumption 1: The data should have been measured without error.
- Assumption 2: Linearity.

- Assumption 3: Normality of the data.
- Assumption 4: Normality of the residuals.
- Assumption 5: Homoscedasticity.
- Assumption 6: Independence of residuals.
- Assumption 7: There should be no autocorrelation between the residuals.
- Assumption 8: Noncollinearity.

For the sake of brevity, descriptions of these assumptions and their tests as relevant to this study are presented in Appendix D: Evaluation of Linear Regression Assumptions rather than in presenting them here in Chapter 4. In summary, all eight assumptions were demonstrated to have been met sufficiently to reveal robust results. Any results that were statistically significant, by definition, may be inferred as being representative of the population being sampled.

I used Cronbach’s alpha on SPSS v21 to test the reliability of the SSPMR items Q5, Q6, Q7, Q8, and Q9 (five items). Q3 “How long have you lived with chronic pain?” and Q4 “How many pain management physicians have you seen for treatment?” were excluded from the test as they were not measuring satisfaction and the scales were open-ended and not the 5-point scale used to measure satisfaction. A detailed account is presented in Appendix E: Reliability Test of the Survey of Satisfaction with Pain Management Regimen. In summary, the SSPMR demonstrated acceptable reliability with a strong Cronbach’s alpha of .779. A Cronbach’s alpha above .70 is commonly regarded as acceptable.

Hypothesis Tests of Primary Dependent Variables

Hypotheses tested were two categories of hypotheses for this nonexperimental study: the primary dependent (criterion) variables (the participants' perceived satisfaction with their current pain management regimens) and ancillary DVs of interest. Two groups of hypotheses (H1 and H2) represented the primary independent (predictor) variables—H1, the perceived disability with pain as measured by the ODI and H2, emotional and behavioral factors as measured by the PAS—were tested for their predictive effects on five primary DVs intended to measure satisfaction with the participant's pain management regimen (Q5, Q6, Q7, Q8, and Q9 of the SSPMR). The score for each of the 10 PAS elements and the PAS total score were tested as individual IVs. Likewise, each of the scores of the 10 sections of the ODI were tested as individual IVs. Table 2 depicts the elements and sections of the PAS and ODI, respectively.

Table 2

Personality Assessment Screener Elements and Oswestry Disability Index Sections

Personality Assessment Screener elements	Oswestry Disability Index sections
Negative affect (NA)	1. Pain intensity
Acting out (AO)	2. Personal care
Health problems (HP)	3. Lifting
Psychotic functioning (PF)	4. Walking
Social withdrawal (SC)	5. Sitting
Hostile control (HC)	6. Standing
Suicidal thoughts (ST)	7. Sleeping
Alienation (AN)	8. Social Life
Alcohol problems (AP)	9. Traveling
Anger control (AC)	10. Changing degree of pain
Total score	ODI Total score
	ODI Range

Table 3 depicts the wording of the questions used as DVs in the hypotheses.

Table 3

Survey of Satisfaction with Pain Management Regimen Questions

Q3 How long have you lived with chronic pain?

Q4 How many pain management physicians have you seen for treatment?

Q5 To what degree do you feel chronic pain has changed your life?

Q6 How confident are you that your current pain management physician can help you manage your pain?

Q7 How satisfied are you with your current treatment regimen (e.g., medication, alternatives to medication, SCS, injection for pain, etc.)

Q8 How satisfied are you with the attitude and care you receive from your current pain management staff and physician?

Q9 How empowered do you feel you are to deal with your pain after leaving your pain management physician's appointment?

The following statistical hypotheses were tested. (For the sake of brevity, only the alternate hypotheses are stated here, and the IVs are depicted within the same hypothesis statement):

- H_a1Q5: AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, Total $\neq 0$, where AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, and Total are the slopes of the scores for the respective elements of the PAS, that is, the respective PAS element has a statistically significant effect on the degree the participant feels CP has changed their life (Q5).
- H_a1Q6: AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, Total $\neq 0$, where AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, and Total are the slopes of the scores for the respective elements of the PAS, that is, the respective PAS element has

a statistically significant effect on the confidence the participant has that their current pain management physician can help manage their pain (Q6).

- H_a1Q7: AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, Total ≠ 0, where AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, and Total are the slopes of the scores for the respective elements of the PAS, that is, the respective PAS element has a statistically significant effect on the satisfaction the participant has with their current treatment regimen (Q7).
- H_a1Q8: AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, Total ≠ 0, where AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, and Total are the slopes of the scores for the respective elements of the PAS, that is, the respective PAS element has a statistically significant effect on the satisfaction the participant has with the attitude and care they receive from their current pain management staff and physician (Q8).
- H_a1Q9: AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, Total ≠ 0, where AN, AO, HP, PF, SC, HC, ST, AN, AP, AC, and Total are the slopes of the scores for the respective elements of the PAS, that is, the respective PAS element has a statistically significant effect on the feeling of empowerment the participant has to deal with their pain after leaving their pain management physician's appointment (Q9).
- H_a2Q5: ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, ODI range, Total ≠ 0, where ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, and ODI range are the slopes of

the scores for the respective sections of the ODI, that is, the respective ODI section has a statistically significant effect on the degree the participant feels CP has changed their life (Q5).

- H_a2Q6: ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, ODI range, Total $\neq 0$, where ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, and ODI range are the slopes of the scores for the respective sections of the ODI, that is, the respective ODI section has a statistically significant effect on the confidence the participant has that their current pain management physician can help manage their pain (Q6).
- H_a2Q7: ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, ODI range, Total $\neq 0$, where ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, and ODI range are the slopes of the scores for the respective sections of the ODI, that is, the respective ODI section has a statistically significant effect on the satisfaction the participant has with their current treatment regimen (Q7).
- H_a2Q8: ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, ODI range, Total $\neq 0$, where ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, and ODI range are the slopes of the scores for the respective sections of the ODI, that is, the respective ODI section has a statistically significant effect on the satisfaction the participant

has with the attitude and care they receive from their current pain management staff and physician (Q8).

- *H*$_a$2Q9: ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, ODI range, Total ≠ 0, where ODI1. ODI2. ODI2. ODI4. ODI5. ODI6. ODI7. ODI8. ODI9, ODI10, ODI total, and ODI range are the slopes of the scores for the respective sections of the ODI, that is, the respective ODI section has a statistically significant effect on the feeling of empowerment the participant must deal with their pain after leaving their pain management physician's appointment (Q9).

Statistical Results of Tests of Primary Dependent Variable Hypotheses

For *H*$_a$1Q1-Q9 and *H*$_a$2Q1-Q9 predictive effect of PAS and ODI on SSPMR, I ran a multiple, stepwise linear regression for each of the PAS elements and ODI section scores on each of the primary DVs. Table 4 – *Regression Model Summaries of Primary DVs* depicts the regression models for the IVs (i.e., the PAS 11 elements and total scores and the ODI sections scores) for each of the five primary DVs (Q5, Q6, Q7, Q8, and Q9) and Q3 and Q4 (see Table 2 – PAS *Elements and ODI Sections* and Table 3 – Satisfaction with *Pain Management Regimen Survey Questions).* The only primary DV of statistical significance was the effect on Q5 - “To what degree do you feel chronic pain has changed your life?” The multiple correlation was moderate (R = .233). The only statistically significant IV (at the p=.05 level) of all the PAS and ODI variables was PAS

Raw score- Health Problems. The R-Square (.054) indicates that this predictor explained 5.4 percent of the variation in the scores on Q5. That is also to say that 94.6 percent of the variation must be explained by something else.

Table 4

Regression Model Summaries of Primary Dependent Variables

DV	*R*	*R* square	Adjusted *R* square	Std. error of the estimate	Change statistics				
					R square change	*F* change	*df*1	*df*2	Sig. *F* change
Q3	.220[a]	.049	.036	.921	.049	3.982	1	78	.049
Q4	No statistical significance at p=.05								
Q5	.233[b]	.054	.042	.989	.054	4.492	1	78	.037
Q6	No statistical significance at p=.05								
Q7	No statistical significance at p=.05								
Q8	No statistical significance at p=.05								
Q9	No statistical significance at p=.05								

Note. *p* =.05.

a. Predictors: (Constant); PAS Raw score – Acting Out

b. Predictors: (Constant); PAS Raw score - Health Problems

Q3 and Q4, though not primary DVs, were also tested. Q3 – “How long have you lived with chronic pain?” was statistically significant. The multiple correlation was moderate (R = .220). The only statistically significant IVs (at the p=.05 level) of all the PAS and ODI variables were PAS Raw score - Acting Out. The R-square (.049) indicates that this predictor explained only 4.9 percent of the variation in the scores on Q3. That is also to say that 96.1 percent of the variation is explained by something else. Q4 “How many pain management physicians have you seen for treatment?” was not statistically significant.

Table 5 depicts the specific effects of the respective IVs on the respective DVs. The only DVS of statistical significance for the PAS and ODI IVs were Q5 and Q3.

For Q5—To what degree do you feel chronic pain has changed your life? -only IV PAS Raw score–Health Problems was a statistically significant predictor of how much CP had changed the participant's life. The slope (B = .140) indicates that for each point increase in the 4-point scale PAS Raw score–Health Problems, the 5-point scale Q5 increased by .140 points. That is to say that the higher a participant scored in Health Problems, the more they felt CP has changed their life.

Table 5

Statistically Significant Coefficients of Independent Variables on Respective Primary Dependent Variables

DV	IV	Unstandardized coefficients		Standardized coefficients	t	Sig.	95.0% confidence interval for B		Collinearity statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
Q3	(Constant)	6.073	.140	--	43.358	.000	5.794	6.352	--	--
	PAS Raw score - Acting Out	.113	.057	.220	1.996	.049	.000	.226	1.000	1.000
Q5	(Constant)	3.307	.288	--	11.468	.000	2.733	3.881	--	--
	PAS Raw score - Health Problems	.140	.066	.233	2.119	.037	.140	.066	.233	2.119

Note. p = .05.

For Q3—How long have you lived with chronic pain? —PAS Raw score–Acting Out was the only statistically significant predictor. The slope (B = .113) indicates that for each point increase in the 4-point scale PAS Raw score – Acting Out, the 5-point scale

Q3 increased by .113 points. That is to say that the higher a participant scored in Acting Out, the longer they had been living with CP.

Hypothesis Tests of Ancillary Dependent Variables of Interest

Although the primary research question had been addressed with the above regressions, it was of appropriate interest to see if gender and age were predictors of how participants responded to the questions on the Survey of Satisfaction with Pain Management Regimen (Q3 – Q9) and individual PAS elements and ODI sections. Three additional groups of hypotheses (H3, H4, and H5) were tested:

- H_a3_{SURVEY}: Gender, Age $\neq 0$, where Gender and Age are the slopes of IVs Gender and Age, that is, Gender and Age, respectively, are statistically significant predictors of each of the seven survey questions (Q3 – Q9).
- H_a4_{PAS}: Gender, Age $\neq 0$, where Gender and Age are the slopes of IVs Gender and Age, that is, Gender and Age, respectively, are statistically significant predictors of each of the nine PAS elements and total score.
- H_a5_{ODI}: Gender, Age $\neq 0$, where Gender and Age are the slopes of IVs Gender and Age, that is, Gender and Age, respectively, are statistically significant predictors of each of the 10 ODI sections and total score.

For $H_a3_{\text{SURVEY,}}$ predictive effect of gender and age on the primary DVs, a multiple stepwise regression was run for the predictive effects of gender and age on each of the primary DVS Q5, Q6, Q7, Q8, and Q9, and for Q3 and Q4. Table 6 depicts the significant correlations. The only DV that had a statistically significant predictor was Q5 “To what degree do you feel chronic pain has changed your life”. The only significant predictor was Age with a moderate multiple R correlation of .241. The R-square (.046) indicates that 4.6 percent of the variation in the scores on Q5 is explained. That is also to say that 95.4 percent of the variation must be explained by something else. Gender was not a statistically significant predictor on any DV.

Table 6

Regression Model Summaries of Gender and Age on Primary Dependent Variables

DV	R	*R* square	Adjusted *R* square	Std. error of the estimate	Change statistics				
					R square change	*F* change	*df*1	*df*2	Sig. *F* change
Q5	.241[a]	.058	.046	.988	.058	4.791	1	78	.032

a. Predictors: (Constant); Age; (Gender was not statistically significant)

Note. DVs Q3, Q4, Q6, Q7, Q8, and Q9 were not statistically significant for gender or age.

Table 7 depicts the specific effects of IVs Age and Gender on the primary DVs. The only DV of statistical significance was Q5. For Q5 “To what degree do you feel chronic pain has changed your life”, only Age was statistically significant. The slope (B = - .017) indicates that for each year increase in a participant’s age, the score on the 5-point scale Q5 decreased by .017 points. That is to say that the older a participant was the less they had felt CP has changed their life.

Table 7

Statistically Significant Coefficients of Gender and Age on Respective Dependent Variables

DV	IV	Unstandardized coefficients		Standardized coefficients	t	Sig.	95.0% confidence interval for B		Collinearity statistics	
		B	Std. error	Beta			Lower bound	Upper bound	Tolerance	VIF
Q5	(Constant)	5.207	.507		10.277	.000	4.199	6.216	--	--
	Age	-.017	.008	-.241	-2.189	.032	-.033	-.002	1.000	1.000

Note. *p* = .05. Q3, Q4, Q6, Q7, Q8, and Q9 were not statistically significant for Gender or Age

For H_a4_{PAS} and H_a5_{ODI}, predictive effect of gender and age on PAS and ODI, A multiple stepwise regression was run for the predictive effects of gender and age on each of the PAS’ elements and DI sections. Table 8 depicts the significant correlations. Only PAS Negative Affect and Total, and ODI Personal Care Lifting, Sitting, Sleeping, Total, and Range were statistically significant.

Table 8

Regression Model Summaries of Gender and Age on Personality Assessment Screener-Raw and Oswestry Disability Index Scores

DV	*R*	*R* square	Adjusted *R* square	Std. error of the estimate	Change statistics				
					R square change	*F* change	*df*1	*df*2	Sig. *F* change
PAS negative affect	.303[A]	.092	.080	1.688	.092	7.893	1	78	.006
PAS Total	.324[A]	.105	.094	5.125	.105	9.166	1	78	.003
PAS Raw scores for AO, HP PF, SW, HC, ST, AN, AP, and AC	No statistical significance at P=.05 level								
ODI Personal Care	.301[A]	.090	.079	1.210	.090	7.754	1	78	.007
ODI Lifting	.458[G]	.209	.199	1.305	.209	20.654	1	78	.000
ODI Sitting	.395[A]	.156	.145	1.197	.156	14.422	1	78	.000
ODI Sleeping	.493[A]	.243	.233	1.123	.243	25.062	1	78	.000
ODI Total	.343[G]	.118	.106	6.321	.118	10.390	1	78	.002
ODI Percentile range	.343[G]	.118	.106	.12641	.118	10.390	1	78	.002
ODI Pain intensity, walking, standing, social life, traveling, changing degree of pain	No statistical significance at P=.055 level								

A. Predictors: (Constant); Age; (Gender was not statistically significant)

G. Predictors: (Constant); Gender (Age was not statistically significant)

Following is an explanation of the regression model results:

- For DV PAS Negative Affect, the multiple R correlation was relatively strong (.303) with the R-square (.092) indicating that 9.2% of the variation in the scores of Negative Affect is explained by the IV Age.
- For DV PAS Total score, the multiple R correlation was relatively strong (.324) with the *R*-square (.105) indicating that 10.5% of the variation in the scores of the PAS total is explained by the IV Age.

- For DV ODI Personal Care, the multiple *R* correlation was relatively strong (.301) with the R-square (.090) indicating that 9% of the variation in the scores of Personal Care is explained by the IV Age.
- For DV ODI Lifting, the multiple R correlation was strong (.458) with the R-square (.209) indicating that 20.9% of the variation in the scores of Lifting is explained by the IV Gender.
- For DV ODI Sitting, the multiple R correlation was strong (.395) with the R-square (.196) indicating that 19.6% of the variation in the scores of Sitting is explained by the IV Age.
- For DV ODI Sleeping, the multiple R correlation was strong (.493) with the R-square (.243) indicating that 24.3% of the variation in the scores of Sleeping is explained by the IV Age.
- For DV ODI Total score, the multiple R correlation was relatively strong (.343) with the R-square (.118) indicating that 11.8% of the variation in the scores of Total Score is explained by the IV Gender.
- For DV ODI Percentile Range score, the multiple R correlation was strong (.343) with the R-square (.118) indicating that 11.8% of the variation in the scores of Percentile Range is explained by the IV Gender.

Table 9 depicts the specific effects of IVs Age and Gender on each of the PAS' elements and ODI sections. Only Age had a statistically significant predictive effect on

PAS Negative Affect, PAS Raw Total score, and ODI Personal Care, Lifting, Sitting, and Sleeping. Only Gender had statistically significant predictive on ODI Total score and Range.

Table 9

Statistically Significant Coefficients of Gender and Age on Personality Assessment Screener-Raw and Oswestry Disability Index Scores

DV	IV	Unstandardized coefficients		Standardized coefficients	t	Sig.	95.0% confidence interval for B	
		B	Std. error	Beta			Lower bound	Upper bound
PAS Negative Affect	(Constant)	5.075	.866		5.859	.000	3.351	6.799
	Age	-.038	.014	-.303	-2.809	.006	-.065	-.011
PAS Total	(Constant)	22.845	2.630		8.688	.000	17.610	28.080
	Age	-.125	.041	-.324	-3.028	.003	-.207	-.043
ODI Personal Care	(Constant)	4.012	.621		6.463	.000	2.776	5.248
	Age	-.027	.010	-.301	-2.785	.007	-.047	-.008
ODI Lifting	(Constant)	4.000	.183		21.890	.000	3.636	4.364
	Gender	-1.379	.303	-.458	-4.545	.000	-1.984	-.775
ODI Sitting	(Constant)	4.363	.614		7.106	.000	3.141	5.586
	Age	-.037	.010	-.395	-3.798	.000	-.056	-.017
ODI Sleeping	(Constant)	5.303	.576		9.203	.000	4.156	6.450
	Age	-.045	.009	-.493	-5.006	.000	-.063	-.027
ODI Total	(Constant)	32.118	.885		36.288	.000	30.356	33.880
	Gender	-4.738	1.470	-.343	-3.223	.002	-7.665	-1.812
ODI Range	(Constant)	.642	.018		36.288	.000	.607	.678
	Gender	-.095	.029	-.343	-3.223	.002	-.153	-.036

Note. PAS Raw scores for Acting Out, Health Problems, Psychotic Functioning, Social Withdrawal, Hostile Control, Suicidal Thoughts, Alienation, Alcohol Problems, and Anger Control and ODI Pain Intensity, Walking, Standing, Social Life, Traveling, and Changing Degree of Pain were not statistically significance at the P=.10 level

Following is an explanation of the actual predictive effects of the IVs on the PAS and ODI DVs:

- For PAS Negative Affect, only Age was statistically significant (Sig. = .006). The slope (B = - .038) indicates that for each year increase in a participant's age, the score on the 4-point scale Negative Affect decreased by .038 points.
- For PAS Total score, only Age was statistically significant (Sig. = .003). The slope (B = - .125) indicates that for each year increase in a participant's age, the score on the 4-point scale Total score decreased by .125 points.
- For ODI Personal Care, only Age was statistically significant (Sig. = .007). The slope (B = - .027) indicates that for each year increase in a participant's age, the score on the 6-point scale Personal Care score decreased by .027 points.
- For ODI Lifting, only Gender was statistically significant (Sig. = .000). The slope (B = - 1.379) indicates that, for Males, the score on the 6-point scale Lifting score was 1.379 points less than Females.
- For ODI Sitting, only Age was statistically significant (Sig. = .000). The slope (B = - .037) indicates that for each year increase in a participant's age, the score on the 6-point scale Sitting decreased by .037 points.
- For ODI Sleeping, only Age was statistically significant (Sig. = .002). The slope (B = - .045) indicates that for each year increase in a participant's age, the score on the 6-point scale Sleeping decreased by .045 points.

- For ODI Total, only Gender was statistically significant (Sig. = .000). The slope (B = - 4.738) indicates that, for Males, the score on the 6-point scale Sleeping was 4,748 points less than for Females on average.
- For ODI Total, only Gender was statistically significant (Sig. = .000). The slope (B = - .095) indicates that, for Males, the score on the 6-point scale Sleeping was 4,748 points less than for Females on average.

Statistical Conclusions

Following are the statistical conclusions to the tests of the five hypothesis groups Ha1, Ha2, Ha3, Ha4, and Ha5. Within these groups are individual statistical hypotheses. To reduce confusion, only the alternate hypotheses (Ha) are stated as it is assumed the null (Ho) simply states that the respective IV is not a statistically significant predictor.

- H_a1_{Q3}: The nine PAS elements and Total score predict how long a person has lived with CP (Q3). Only PAS Acting Out was statistically significant. Therefore, we reject Ho and conclude that Acting Out score is a predictor of the score on Q3. We further do not reject Ho for all other PAS elements and conclude they are not predictors of Q3.
- H_a1_{Q4}: The nine PAS elements and Total score predict how many physicians a person has seen for treatment (Q4). None of the PAS’ elements were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS’ elements are predictors of scores on Q4.
- H_a1_{Q5}: The nine PAS elements and Total score predict the degree of a person’s CP has changed their life (Q5). Only PAS Health Problems was

statistically significant. Therefore, we reject Ho and conclude that Health Problems score is a predictor of the score on Q5. We further do not reject Ho for all other PAS elements and conclude they are not predictors of Q5.

- H_a1_{Q6}: The nine PAS elements and Total score predict a person's confidence that their current pain management physician can help manage their pain (Q6). None of the PAS' elements were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS' elements are predictors of scores on Q6.
- H_a1_{Q7}: The nine PAS elements and Total score predict a person's satisfaction with their current treatment regimen (Q7). None of the PAS' elements were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS' elements are predictors of scores on Q7.
- H_a1_{Q8}: The nine PAS elements and Total score predict a person's satisfaction with the attitude and care they receive from their current pain management staff and physician (Q8). None of the PAS' elements were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS' elements are predictors of scores on Q8.
- H_a1_{Q9}: The nine PAS elements and Total score and ODI sections predict a person's feeling of empowerment the participant has to deal with their pain after leaving their pain management physician's appointment (Q9). None of the PAS' elements were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS' elements are predictors of scores on Q9.

- H_a2_{Q3}: The 10 ODI sections and Total score, predict how long a person has lived with CP (Q3). None of the ODI sections were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS' elements are predictors of scores on Q3.
- H_a2_{Q4}: The 10 ODI sections and Total score predict how many physicians a person has seen for treatment (Q4). None of the ODI sections were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS' elements are predictors of scores on Q4.
- H_a2_{Q5}: The 10 ODI sections and total score, predict the degree the participant feels CP has changed their life (Q5). None of the ODI sections were statistically significant, therefore, we do not reject H_0 and conclude that none of the PAS elements are predictors of scores on Q5.
- H_a2_{Q6}: The 10 ODI sections and Total score predict a person's confidence that their current pain management physician can help manage their pain (Q6). None of the ODI sections were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS' elements are predictors of scores on Q5.
- H_a2_{Q7}: The 10 ODI sections and Total score predict a person's satisfaction with their current treatment regimen (Q7). None of the ODI sections were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS' elements are predictors of scores on Q5.

- H_a2_{Q8}: The 10 ODI sections and Total score predict a person’s satisfaction with the attitude and care they receive from their current pain management staff and physician (Q8). None of the ODI sections were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS’ elements are predictors of scores on Q5.
- H_a2_{Q9}: The 10 ODI sections and Total score and ODI sections predict a person’s feeling of empowerment to deal with their pain after leaving their pain management physician's appointment (Q9). None of the ODI sections were statistically significant, therefore, we do not reject Ho and conclude that none of the PAS’ elements are predictors of scores on Q5.
- H_a3_{SURVEY}: Gender and Age predict how a person responds to questions on the Survey of Satisfaction with Pain Management Regimen. Age was statistically significant for Q5 only. Therefore, we reject Ho and conclude that Age is a statistically significant predictor of the degree the participant feels CP has changed their life (Q5). We further do not reject Ho for Gender for Q3, Q4, Q5, Q6, Q7, Q8, and Q9 and conclude that Gender is not a statistically significant predictor of scores on those survey questions.
- H_a4_{PAS}: Gender and Age predict how a person responds to each of the PAS’ elements. Only Age was statistically significant for PAS Negative Affect and Total. Therefore, we reject Ho and conclude that Age is a statistically significant predictor of the score on Negative Affect and the Total score. We

further do not reject Ho for Gender and conclude that Gender is not a statistically significant predictor of scores on any of the PAS’ elements.

- H_a5_{ODI}: Gender and Age predict how a person responds to each of the ODI sections. For ODI Personal Care, Sitting, and Sleeping, only Age was statistically significant. Therefore, we reject Ho for those IVs and conclude that Age is a statistically significant predictor of the scores on Personal Care, Sitting, and Sleeping. We further do not reject Ho for Age for Pain Intensity, Lifting, Walking, Standing, Social Life, Traveling, Changing Degree of Pain, Total score, and Percentile Range and conclude that Age is not a statistically significant predictor of scores on those ODI sections. For ODI Lifting, Total score, and Percentile Range, only Gender was statistically significant. Therefore, we reject Ho for those DVs and conclude that Gender is a statistically significant predictor of ODI Lifting, Total score, and Percentile Range. We further do not reject Ho for Gender for Pain Intensity, Personal Care, Walking, Sitting, Sleeping, Standing, Social Life, Traveling, Changing Degree of Pain, and Total score and conclude that Gender is not a statistically predictor of scores on those ODI sections.

Results Summary

Following is a summary and overall interpretation of the significant results.

Ability of Personality Assessment Screener to Predict Satisfaction with Pain Treatment Regimen

The PAS was a predictor of only two questions on the SSPMR: Q3, “How long have you lived with chronic pain,” and Q5, “To what degree do you feel chronic pain has changed your life.” For Q3, only PAS Acting Out element was a predictor. Acting Out is described by the PAS as “Elevated scores on this indicate issues with impulsivity, sensation-seeking, recklessness, and a disregard for convention and authority.” The results of this study indicate that the higher a person scores on Acting Out, the longer the person has lived with CP.

For Q5, Health Problems was the only predictor. Health Problems is described as “Elevated scores on this scale indicate concerns about somatic functioning as well as impairment arising from these somatic symptoms. The types of complaints reported may range from vague symptoms of malaise to severe dysfunction in specific organ systems.” The results of this study indicate that the higher a person scores on Health Problems, the greater the degree CP has changed their life.

Ability of Oswestry Disability Index to Predict Satisfaction with Pain Treatment Regimen

None of the 10 ODI sections were predictors of any of the seven questions (Q3 – Q9) on the Satisfaction with Pain Management Survey.

Ability of Age and Gender to Predict Satisfaction with Pain Treatment Regimen

Only Age predicted only Q5. Gender did not predict any of the scores on any of the survey questions. The results of this study indicate that the older a person is, regardless of gender, the greater the degree CP has changed their life.

Ability of Age and Gender to Predict Responses to the PAS

Only Age was a predictor of only Negative Affect and Total score. Negative Affect is described by the PAS as “Elevated scores on this scale indicate potential problems with depression, anxiety, personal distress, tension, worry, and feeling demoralized.” The results of this study indicate that the older a person is, regardless of gender, the more they feel Negative Affect. The predictive effect on Total score is probably due to the score on Negative Affect being reflected in the Total score.

Ability of Age and Gender to Predict Responses to the ODI

Only Age predicted scores on ODI Personal Care, Sitting, and Sleeping. The results of this study indicate that the older a person is, regardless of gender, the more they feel dysfunction with personal care, sitting, and sleeping. Age did not predict scores on Pain Intensity, Lifting, Walking, Standing, Social Life, Traveling, Changing Degree of Pain.

Only Gender predicted Lifting, Total score, and Percentile Range in which Men scored lower than Women in all three on average. The results of this study indicate that men tend to feel more dysfunction than women in lifting things. The lower average scores for men than women in Total score and Percentile Range is probably due to the score on Lifting being reflected in the Total score and Percentile Range. Gender did not predict Pain Intensity, Personal Care, Walking, Sitting, Sleeping, Standing, Social Life, Traveling, Changing Degree of Pain, and Total.

Chapter Summary

The results revealed that the PAS element Acting Out was a statistically significant predictor of a patients' length of time with CP and that PAS element Health Problems was a statistically significant predictor of the degree of how a person's CP has changed their life. Age and Gender has some significance ability to predict some of the PAS and SSPMR variables. Chapter 5: Conclusion that discusses the findings as they are related to the literature, the limitations of the study, the implications of the findings for the practice of pain management, as well as recommendations for further study.

Chapter 5: Conclusions

This chapter presents the findings of this study as they relate to the literature, the limitations of the study, the implications of the findings for the practice of pain management, and a recommendation for further study. I also present an answer to the research question from the results of the study in the conclusion. I used a quantitative, nonexperimental research design to determine if CP patients' perception of their disability and their emotional and/or behavioral problems would predict their satisfaction with their pain management. I conducted this study by using existing data from a convenient sampling of chronic low back pain patients who previously had psychological surgical clearances for an SCS trial/implant procedure. Scores from two of their self-report measures (i.e., PAS and ODI) completed during the psychological surgical clearance were used along with a survey questionnaire to measure the participants' satisfaction with their current pain management regimen. The DV was the reported level of participants' satisfaction with their pain management regimen. The primary IVs included the patient's perceived level of disability with pain (as measured by the PAS) and the patient's potential for emotional or behavioral problems (as measured by the ODI). The patients' ages and gender were secondary IVs. The outcome of this study showed little statistically significant correlation between these variables.

Interpretation of the Findings

According to the results of this linear regression, there were two statistically significant predictors found from the DV (i.e., SSPMR results). Firstly, it showed the IV-PAS/Acting Out is a statistically significant predictor of a patients' length of time with

CP (i.e., Q3). Secondly, it showed the IV-PAS/Health Problems is a statistically significant predictor of the degree of how a person's CP has changed their life (Q5). The only statistically significant IV of all the PAS/ODI variables was the PAS raw score Health Problems-HP. Therefore, HP does predict how CP has changed their life. Age and gender seemed to be a greater predictor than other variables. On the SSPMR (DV), age is a statistically significant predictor of the degree the participant feels CP has changed their life. Gender was not found statistically significant. On the PAS (IV), only age was statistically significant for Negative Affect and Total. For the ODI (IV), age was found to be statistically significant with personal care, sitting, and sleeping. Gender was statistically significant predictor of lifting, total score, and percentile range.

As stated in Chapter 2: Literature Review, a literature search of peer-reviewed sources revealed an absence of literature relating to the perceived level of disability with pain and a patient's emotional and behavioral issues surrounding pain as they related to their satisfaction with pain management. As discussed in Chapter 2, previous research findings (e.g., Bair et al., 2008; Grandner, 2017) have shown CP as significantly correlated to negative physical and mental health issues (e.g., decreased quality of life, emotional distress, and difficulty in daily functioning). These studies were corroborated with the results noted in Chapter 4: Findings indicating a CP patients' length of time in CP increases the potential for acting out and the degree of a patients' health problems changing their quality of life. The elevated scores on the PAS/AO were found with a potential increase with a pattern of reckless behavior, substance abuse, impulsivity, and acts of self-destruction (Morey, 1997). It was further noted that an elevation of HP in the PAS often indicated increased issues with somatic complaints and health concerns that manifested in emotional problems.

To some extent, the results from Chapter 4 supported the theoretical framework of the revised HBM. As explained in Chapter 1: Introduction, the HBM theorizes that a person's perception of health benefit initiates a course of action based on expectations of receiving that benefit. In the context of this study, a person's expectations of obtaining pain relief would motivate that person to going to a pain physician for help. With respect to the HBM, the results of this study show two significant predictors: acting out as a predictor of a patient's length of time in CP and health problems as a predictor of how CP has changed the patient's life. The longer the patients remain in pain, their responses or behaviors to daily life stresses adversely increase. That is, the longer the person suffered with pain, the more that person acted out as measured on the PAS. This suggests that as patients continue to suffer with CP, their expectations of deriving the benefit of relief diminish, and this prompts a behavior of frustration and "impulsivity, sensation-seeking, recklessness, and a disregard for convention and authority" as defined by the PAS. Thus, a person's perception of pain can be influenced by a multitude of situational/emotional factors and past experiences with pain contributing to their satisfaction or dissatisfaction with their treatment regimen. Thus, the results of this study suggest that the PAS and ODI cannot substantially predict satisfaction with pain management due to the vast number of variables influencing a person's health beliefs and expectations.

Limitations of the Study

This research relied on patient participation to complete a survey on the patient’s satisfaction or dissatisfaction with their pain management. However, it was found that many patients were not interested in completing the survey, possibly due to them feeling a survey would not improve their pain management regimen/treatment. This could be linked to negative beliefs/mental defeat in relationship to a patient’s perception of obtaining adequate pain management because nothing so far has alleviated their pain. Therefore, this could have limited the response rate of patients with the highest rating of pain and possible dissatisfaction with pain management.

Additionally, the PAS and ODI data, from psychological presurgical clearances at Carewright, were completed up to a year prior to completing the patient survey. Thus, the patient’s experiences and situations could have changed during that time and affected the rating of patient satisfaction with their pain management regimen. Further, this study included variables that could be related to other issues such as psychiatric/medical diagnoses or unrelated experiences. Furthermore, patients suffering CP could have been experiencing an aggravation of pain during the survey process. This could have contributed to alterations in the testing conditions thereby threatening the validity of the data collected.

Recommendations for Further Study

Further study could be done on satisfaction with pain management from the viewpoint of the spouse, partner, or caregiver of a CP patient. The caregiver role of viewing satisfaction with pain management for their patient could bring into the study an unbiased view of the patient’s success with the treatment regimen. Also, this study could be repeated to include the Survey of Pain Attitudes and the Millon Behavioral Medicine Diagnostic, which are also diagnostic tools used in screening for advanced pain treatment.

Implications to the Practice

The results of this study suggested that pain management centers should promote positive social change by considering all factors related to a CP patient, including the patients’ length of time with CP, the patients’ health problems (i.e., mental and physical), and the degree that CP is hindering the ability to function in the patients’ daily life. Thus, pain management practitioners should discuss comorbid health issues with their patients and how it affects their treatment regimen. Additionally, the results of this study show how pain management physicians must acknowledge the individuality of CP patients’ experiences with pain. This is because a person’s perception of pain creates their satisfaction/nonsatisfaction with their treatment regimen.

Conclusion

From the results of this study, I conclude that a CP patients’ perception of their disability and their emotional and/or behavioral problems do not predict their satisfaction with pain management regime. Pain patients are getting limited pain relief, which is why they are seeing pain management physicians. The results further imply that CP patients will be satisfied with any treatment if it decreases their pain. Further, the results suggest that pain management physicians should not worry about whether a patient is “satisfied,” but they should focus on improving or lessening the patients’ level/perception of pain. To improve the quality of life of those suffering with CP, pain management physicians need to focus on reducing the pain of their patients and aiding their patients with developing better coping skills to lessen or dissolve the comorbid factors (psychological, behavioral, and emotional) with CP.

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Appendix A: Survey of Satisfaction with Pain Management Regimen

Satisfaction Survey of Pain Management

Q1: Acknowledgement of Informed Consent. If you feel you understand the study well enough to make a decision about participating, please click "YES". By submitting a survey, you are also granting permission for Carewright Clinical to release your ODI and PAS scores to me for analysis in my study. You are encouraged to print or save a copy of this consent form.

Q2: Please enter your participant number as provided to you on the emailed flier from Carewright.

Q3: How long have you lived with chronic low back pain?

Q4: How many pain management physicians have you seen for treatment (including the one you see now)?

Q5: On a scale of 1 to 5, to what degree do you feel chronic pain has changed your quality of life, with 1 being "somewhat changed" to 5 being "severely changed".

Q6: On a scale of 1 to 5, how confident are you that your current pain management physician can manage your pain, with 1 being "not all confident" to 5 being "highly confident".

Q7: How satisfied are you with your current treatment regimen (e.g., medication, alternatives to medication, SCS, injections, etc.)? 1- "very dissatisfied" and 5- "very satisfied".

Q8: How satisfied are you with the attitude and care received from your current pain management physician and staff? 1- "very dissatisfied" and 5- "very satisfied".

Q9: How empowered do you feel to deal with your pain after leaving your pain management physician's appointment? 1- "not very empowered" and 5- "very empowered".

Q10: Please enter your email to be receive your $20 gift card as a thank you for your participation.

Appendix B: Evaluation of Statistical Assumptions

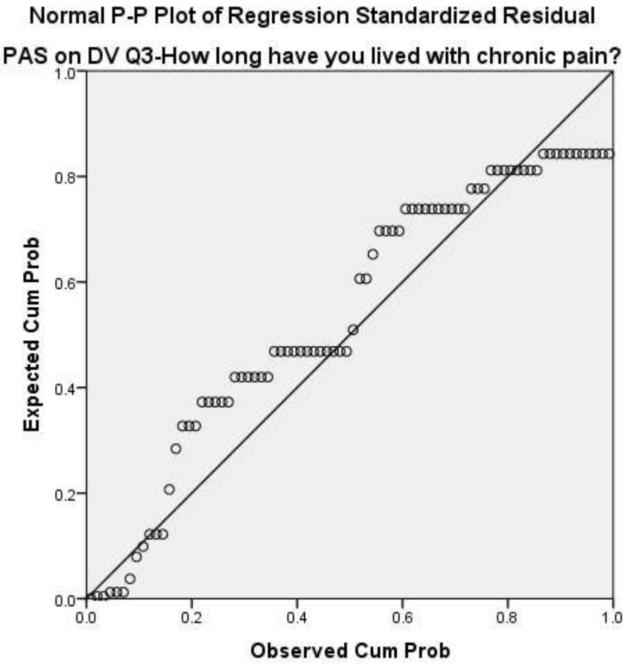
Following is a presentation of the results of tests of eight key assumptions of linear regression in the study of the predictive effect of eleven PAS elements and twelve ODI sections (run as two distinct regressions) on DVs Q3-Q9 of the SSPMR The only statistically significant results were the effect of PAS element-Acting Out on DV Q3 “How long have you been living with chronic pain”, PAS element Health Problems on DV Q5 “To what degree do you feel chronic pain has changed your life”, and ODI section Sleeping on DV Q5.

Assumption 1: The data should have been measured without error. Data collection is presumed to be accurate as they were collected from an online survey with standard responses for most questions thus reducing arbitrariness in interpretation of the response for the analysis. No errors in the responses were detected.

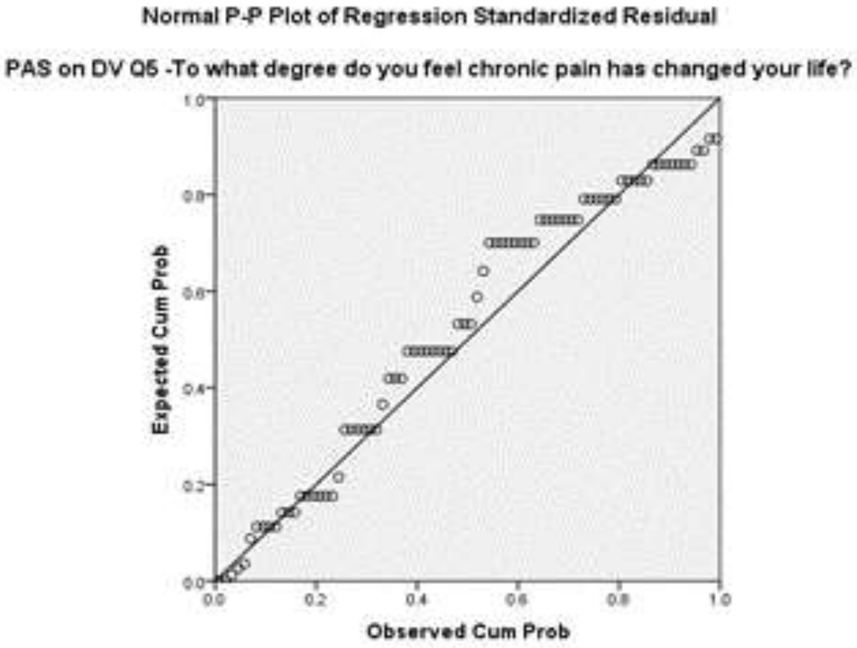
Assumption 2: Linearity. The relationship between the IVs and the DVS should be linear, indicated by a visual inspection of a plot of observed vs predicted values symmetrically distributed around a diagonal line or symmetrically around a plot of residuals vs predicted values (around horizontal line). PAS only had a statistically significant effect on DVs Q3 and Q5 and ODI only had a significant on Q5. Linearity was assessed from a visual inspection of the probability plots (P-P) of the expected (Y-axis) and observed (X-axis) residuals. Figure D-1 – Regression Probability Plots depicts the regression scatterplots for those relationships. Although there is some bowing and S-curving, it is not deemed sufficiently large, especially for the sample size of 80, to consider the data as not linear.

Figure D1

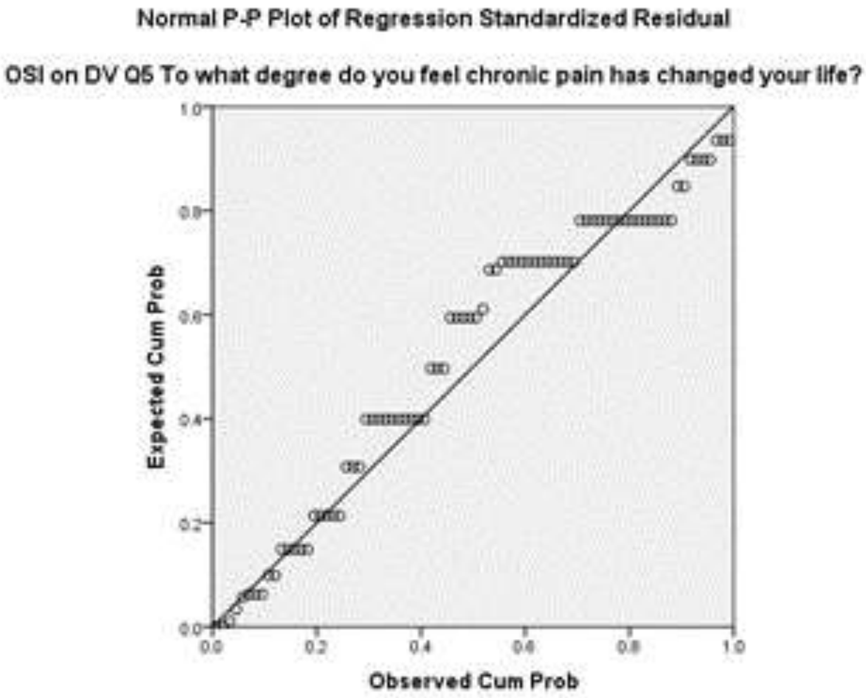
Regression Probability Plots



Note. n = 80.



Note. n = 80.



Note. *n* = 80.

Assumption 3: Normality of the Data. The data should be normally distributed, indicated by a skewness statistic for each variable to be between -3 and +3. Table D1 depicts the skewness statistic for all variables, except PAS Psychotic Functioning (3.323) and Suicidal Thoughts (5.965), were between the rule of thumb for normality of -3 to +3. As the variables Psychotic Functioning and Suicidal Thoughts were not statistically significant in the regressions, they were excluded from the regressions and therefore had no effect on the result of the regression.

Table D1

Descriptive Statistics of Personality Assessment Screener and Oswestry Disability Index Variables Entered in the Regressions

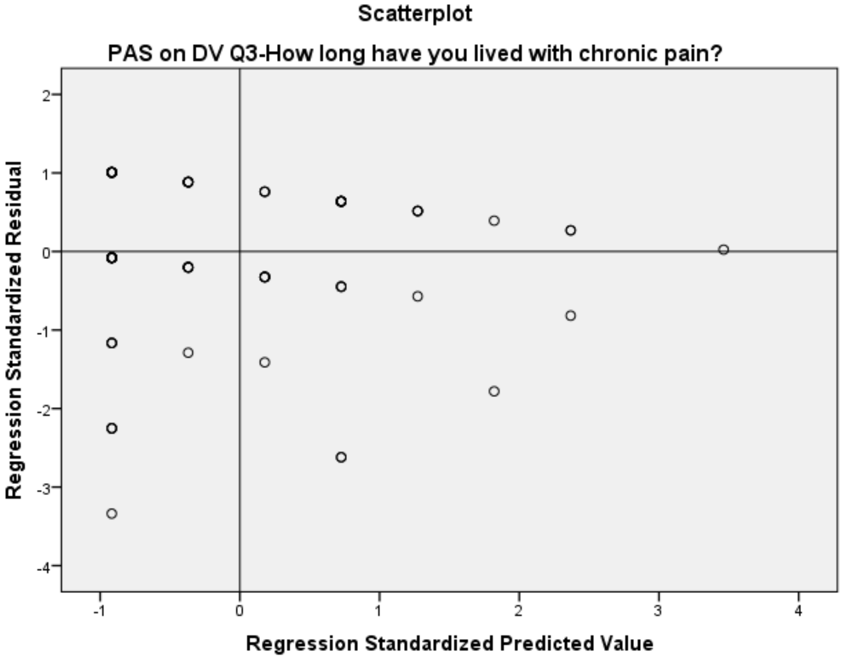
	N	Range	Mini	Max	Mean		Std. Dev.	Variance	Skewness		Kurtosis	
	Sta.	Stat.	Stat.	Stat.	Stat.	Std. Error	Stat.	Stat.	Stat.	Std. Error	Stat.	Std. Error
PAS Negative Affect	80	8	0	8	2.70	.197	1.760	3.099	.815	.269	.299	.532
PAS Acting Out	80	8	0	8	1.68	.204	1.826	3.336	1.112	.269	.964	.532
PAS Health Problems	80	6	0	6	3.46	.188	1.683	2.834	.018	.269	-.856	.532
PAS Psychotic Functioning	80	4	0	4	.26	.079	.707	.500	3.323	.269	12.260	.532
PAS Social Withdrawal	80	6	0	6	1.78	.158	1.414	1.999	.632	.269	.318	.532
PAS Health Control	80	6	0	6	2.26	.149	1.329	1.766	.596	.269	.185	.532
PAS Suicidal Thoughts	80	4	0	4	.11	.059	.528	.278	5.965	.269	39.717	.532
PAS Alienation	80	5	0	5	1.14	.146	1.310	1.715	.953	.269	-.021	.532
PAS Alcohol Problems	80	3	0	3	.28	.080	.711	.506	2.793	.269	7.259	.532
PAS Anger Control	80	4	0	4	1.39	.134	1.196	1.430	.342	.269	-1.117	.532
PAS Total	80	23	4	27	15.08	.602	5.383	28.982	.296	.269	-.367	.532
ODI Pain Intensity	80	5	0	5	4.01	.092	.819	.671	-1.72	.269	6.615	.532
ODI Personal Care	80	5	0	5	2.33	.141	1.261	1.589	-.137	.269	-.668	.532
ODI Lifting	80	4	1	5	3.50	.163	1.458	2.127	-.502	.269	-1.188	.532
ODI Walking	80	5	0	5	3.80	.150	1.344	1.808	-1.131	.269	.303	.532
ODI Sitting	80	5	0	5	2.09	.145	1.295	1.676	-.166	.269	-.352	.532
ODI Standing	80	5	0	5	3.40	.128	1.143	1.306	-.895	.269	.721	.532
ODI Sleeping	80	5	0	5	2.49	.143	1.283	1.645	-.396	.269	-.874	.532
ODI Social Life	80	5	0	5	2.80	.116	1.036	1.073	-.286	.269	1.433	.532
ODI traveling	80	4	0	4	2.36	.106	.945	.892	-.146	.269	-.205	.532
ODI Changing Degree of Pain	80	5	0	5	3.66	.107	.954	.910	-1.423	.269	3.190	.532
ODI TOTAL	80	30	12	42	30.40	.747	6.686	44.699	-.381	.269	-.706	.532
ODI Percentile Range	80	.60	.24	.84	.6080	.01495	.13371	.018	-.381	.269	-.706	.532

Assumption 4: Normality of the Residuals. The residuals should be normally distributed across the regression line indicated by a visual inspection of the normal probability plot, i.e., points on the plot should fall close to the diagonal reference line, while a bow-shaped pattern of deviations from the diagonal would indicate that the residuals have excessive skewness. Figure D1 depicts relatively little “bowing” in the plot of residuals not sufficiently large, considering the relative sample size of 80, to consider the data as not normal.

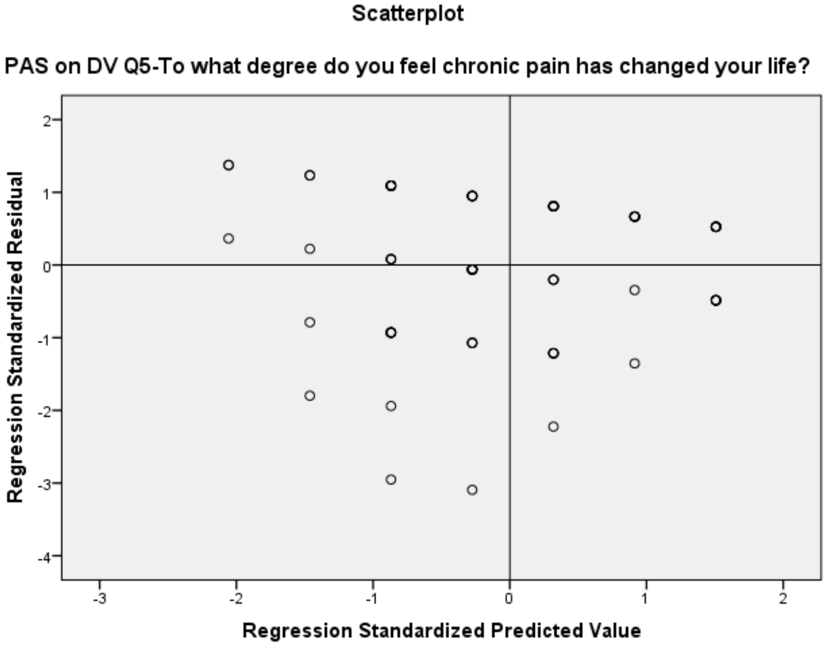
Assumption 5: Homoscedasticity. The variances of the residuals should be equal across the regression line, indicated by a scatter-plot of residuals versus predicted values with little evidence of residuals that grow larger either as a function of time (for time series regression) or as a function of the predicted value (for ordinary least squares regression). Figure D2. Data points were relatively evenly/symmetrically distributed around the horizontal line at “0” standardized predicted value indicating no trend of values growing larger as a function of predicted value and, thus, can be considered homoscedastic.

Figure D2

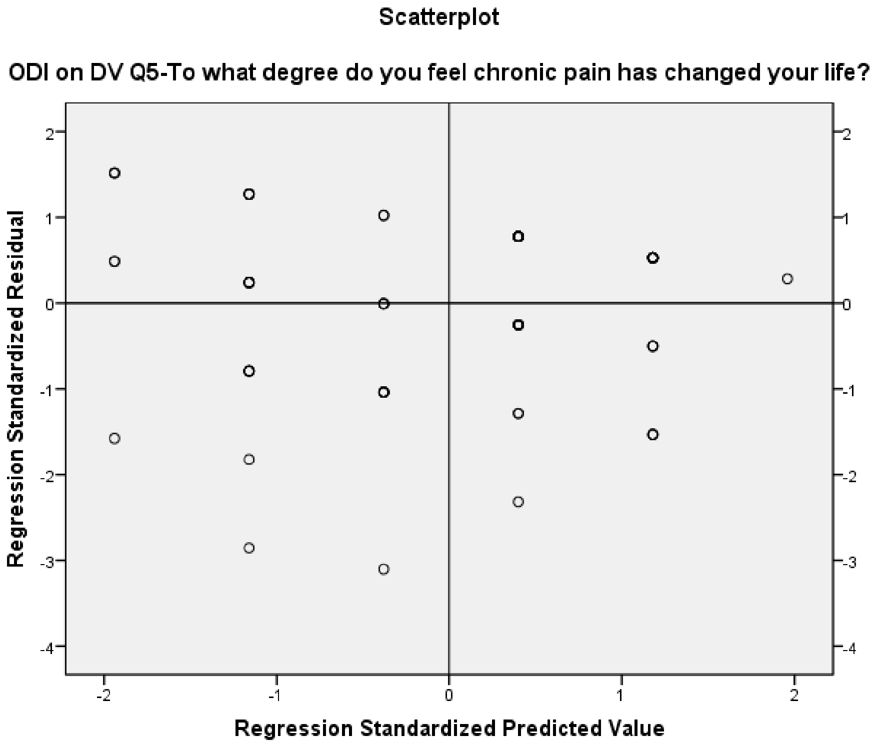
Regression Scatterplots



Note. n = 80.



Note. n = 80.



Note. n = 80.

Assumption 6: Independence of Residuals. The residuals should be independent of each another (especially in time series plot (i.e., residuals vs. row number), indicated by a scatter-plot of standardized residuals (y-axis) on standardized predicted (x-axis) showing a relative square of data points around the “0” intersection of the axes within -3 and +3. The variables were tested for independence of residuals with a visual inspection of the scatterplots of the standardized residual against the standardized predicted value. Figure D-2 – Regression Scatterplots, n = 80 depicts data points were relatively evenly/symmetrically distributed around the intersection of the horizontal and vertical lines at “0” with no “clumps” in any quadrant, thus indicating independence of the residuals.

Assumption 7: Residuals should not be auto-correlated. A primary test for auto-correlation is the Durbin-Watson test value within the rule-of-thumb of between 1 and 4 to demonstrate with value of 2 meaning no auto-correlation, values less than 2 meaning positive correlation and values greater than 2 meaning an inverse correlation. The

Durbin-Watson test of auto-correlation for the regressions returned values of 1.795 for PAS on DV Q3, 2.058 for PAS on Q5, and 2.094 for OSI o Q, all well within the rule of thumb of 1 and 4, thus indicating negligible auto-correlation.

Assumption 8: Noncollinearity. The variables should not be collinear with each other as identified by a Pearson's r for each IV against each of the other IVs to be less than .70. Pearson's r was obtained for all variables. Table D-2 – ODI Sections Correlations depicts the correlations of the 12 ODI sections with each other. All correlations were considerably below .70 except the correlation between Total with Range which was not significant. The result demonstrates the variables are not collinear.

Table D2

Oswestry Disability Index Sections Correlations

	Pain Intensity	Personal Care	Lifting	Walking	Sitting	Standing	Sleeping	Social Life	Traveling	Changing Degree of Pain	TOTAL	Range
Pain Intensity	1	.327	.238	.290	.357	.184	.344	.257	.141	.297	.556	.556
Personal Care	.327	1	.262	.270	.277	.216	.230	.506	.144	.166	.596	.596
Lifting	.238	.262	1	.252	.104	.311	.281	.427	.299	.232	.613	.613
Walking	.290	.270	.252	1	.156	.489	.160	.325	.337	.312	.622	.622
Sitting	.357	.277	.104	.156	1	-.041	.569	.381	.139	.301	.568	.568
Standing	.184	.216	.311	.489	-.041	1	.021	.250	.145	.056	.456	.456
Sleeping	.344	.230	.281	.160	.569	.021	1	.398	.270	.333	.635	.635
Social Life	.257	.506	.427	.325	.381	.250	.398	1	.217	.174	.693	.693
Traveling	.141	.144	.299	.337	.139	.145	.270	.217	1	.264	.496	.496
Changing Degree of Pain	.297	.166	.232	.312	.301	.056	.333	.174	.264	1	.512	.512
TOTAL	.556	.596	.613	.622	.568	.456	.635	.693	.496	.512	1	.
Range	.556	.596	.613	.622	.568	.456	.635	.693	.496	.512	.	1

Appendix C: Reliability Test of Survey of Satisfaction with Pain Management Regimen

Cronbach's Alpha on SPSS v 21 was used to test the reliability of the Survey of Satisfaction with Pain Management Regimen, Q5, Q6, Q7, Q8, and Q9 (five items). Q3 "How long have you lived with chronic pain" and Q4 "How many pain management physicians have you seen for treatment" were excluded from the test as they were not measuring of satisfaction, and the scales were open-ended and not the 5-point scale used to measure satisfaction. Table E1 depicts a strong Cronbach's Alpha (.779) indicating the internal consistency (reliability), i.e., the ability of the five-question instrument to produce similar results under consistent conditions, is high. A Cronbach's Alpha above .70 is commonly regarded as acceptable.

Table E1

Summary of Test of Survey of Satisfaction with Pain Management Regimen Reliability

Cronbach's alpha	Cronbach's alpha based on standardized items	*N* of items
.779	.771	5

	SSPMR Item Statistics	Mean	Std. Deviation	N
Q5	To what degree do you feel chronic pain has changed your life?	4.08	1.036	63
Q6	How confident are you that your current pain management physician can help you manage your pain?	4.05	1.224	63
Q7	How satisfied are you with your current treatment regimen (e.g., medication, alternatives to medication, SCS, injection for pain, etc.)	3.97	1.121	63
Q8	How satisfied are you with the attitude and care you receive from your current pain management staff and physician?	4.35	1.180	63
Q9	How empowered do you feel you are to deal with your pain after leaving your pain management physician's appointment?	3.67	1.403	63

Table E2 – *Inter-Item Correlation Matrix* depicts strong correlations (above .50) between Q and Q7 (.565), Q6 and Q8 (.558), Q6 and Q9 (.629), Q7 and Q8 (.630), Q7 and Q9

(.557), and Q8 and Q9 (.539) indicating that these questions are measuring similar concepts, i.e., satisfaction with treatment. The relatively weak correlation (less than .300) between Q5 and Q6 (.200) and Q5 and Q7 (.238) suggests that confidence in the respondent's physician and satisfaction with their pain treatment has little to do with how much they feel chronic pain had changed their lives. This notion is borne out by the regression analysis.

Table E2

Interitem Correlation Matrix

	SSPMR question	Q5	Q6	Q7	Q8	Q9
Q5	To what degree do you feel chronic pain has changed your life?	1.000	.200	.238	.043	.063
Q6	How confident are you that your current pain management physician can help you manage your pain?	.200	1.000	.565	.558	.629
Q7	How satisfied are you with your current treatment regimen (e.g., medication, alternatives to medication, SCS, injection for pain, etc.)	.238	.565	1.000	.630	.557
Q8	How satisfied are you with the attitude and care you receive from your current pain management staff and physician?	.043	.558	.630	1.000	.539
Q9	How empowered do you feel you are to deal with your pain after leaving your pain management physician's appointment?	.063	.629	.557	.539	1.000