PREDICTING POTENTIAL RISK FACTORS OF PRESCRIPTION PAIN MEDICATION MISUSE IN A CHRONIC PAIN POPULATION THROUGH PROMIS GLOBAL HEALTH SCORE

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DEDICATION

I would like to thank the members of my Graduate Committee: Robert Gatchel, PhD, ABPP, Carl Noe, MD, and Richard Robinson, PhD. for their guidance, my parents for their continued support, and the patients at the McDermott Pain Center.

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by

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THESIS

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Abstract

BACKGROUND: Chronic pain patients who are treated through an interdisciplinary treatment program have shown to report less symptoms of pain by a substantial degree. (Gatchel & Okifuji, 2006) Aspects of the Biopsychosocial Model such as physical and mental health, as well as appropriate medication adherence, must be considered for treatment. This study attempts to reinforce the clinical utility of the Biopsychosocial model by illustrating differences in self-perceived physical and mental health status. Subsequently, we hope to identify the influence of mental vs. physical health on pain-behaviors. Overall we hope to find a correlation between a patient's self-reported health, using the Global Health Status PROMIS, and predicting their likelihood to abuse prescription pain medication, as measured through the PMQ (Pain Medication Questionnaire). Successively, clinicians can target the endorsement of poor mental health and/or poor physical health as a distinct concern in reducing pain behaviors such as prescription misuse.

SUBJECTS: The final sample included data from males and females evaluated for the Interdisciplinary Pain Program at the McDermott Pain Clinic at UT Southwestern Medical center. Participants who were not chosen to participate in the IPP were still included in the data set. As the McDermott Pain Clinic does not typically provide care for children and adolescents (<18 years), children and adolescents were excluded from the present study. The test groups will consist of participants between 18 and 90 years of age as referred to the program by psychologists, Dr. Travis Whitfill and Dr. Richard Robinson of UT Southwestern and capable of providing informed consent, able to read and speak English, experiencing non-malignant pain-related problems, and willing to allow access to their electronic medical records.

METHOD: Participants were administered a battery of assessments including the Pain Medication Questionnaire, Global Health Status PROMIS and other established measures of health and pain-related outcomes (e.g., SF-36, PROMIS pain-related measures) at baseline

RESULTS: The results in the current study suggest that the PROMIS mental health score is a significant predictor in examining the likelihood for prescription pain medication misuse. Although the predictor variables of PROMIS physical health, age and gender improved the overall variance of the model when examined as single predictors they were shown not to be significant. The first hypothesis was not supported as shown by the weak linearity in the scatter plots of PROMIS physical and PROMIS mental health scores. Surprisingly, the strength of the relationship of physical and mental health scores was not significantly correlated despite support in the literature; however, this may be due to sampling limitations. The second hypothesis was supported through findings that suggest PROMIS mental health score is a strong predictor of participants' PMQ score. Although PROMIS physical, age and gender improved the overall fit of the model their *p* values were not found to be significant when examined within the model. The latter part of hypothesis two that suggested age and gender would not be significant predictors of PMQ was supported, as their p-values found were .862 for age and .058 for gender, respectively.

DISCUSSION: The current study achieved its stated goals of evaluating the predictive utility of the Global Health Status PROMIS in comparison with the PMQ. The current study offers an important contribution to understanding and evaluating chronic pain and the multifaceted nature of Biopsychosocial outcomes. It is anticipated that future clinical research will continue to expand upon the implications from this study and contribute to more effective evaluation and treatment for individuals suffering from chronic pain and lend attention to risk factors of

prescription pain medication misuse. Through targeting psychological elements in addition to physiological pain reduction clinicians can help reduce risk factors of detrimental pain behaviors.

Keywords: Chronic pain, risk factors, self-report, PROMIS, pain medication, misuse

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

AMA - American Medical Association

EMCPM - Eugene McDermott Center for Pain Management

HIPAA - Health Insurance Portability and Accountability Act

ID - Interdisciplinary Treatment

PC - Psychosocial Component

PMQ- Pain Medication Questionnaire

PROMIS - Patient Reported Outcome Measurement Information System

SPSS - Statistical Product and Service Solutions

CHAPTER ONE

Introduction

Etiology of Pain and Implications

The biomedical model of pain was initially used as a comprehensive model to understand illness and injury. Throughout time further study discovered a new understanding of the roles of psychological and psychosocial variables of disease (Engel, 1977). Migraines, fibromyalgia, and other manifestations of pain are not neatly circumscribed illnesses with a singular physiological etiology. Chronic pain is not only a physical symptom but also a multidimensional illness that impacts all aspects of a patient's life. Rumination of pain, decreased functionality in personal, social and work activities, increased usage of prescriptions and health care services, deflated self-efficacy as well as learned helplessness are common effects of such disorder (Parsons, 1958). Current research suggests that a comprehensive model that can address these psychosocial factors in addition to the standard biomedical approach will reduce symptoms in a chronic pain population (Gatchel & Okifuji, 2006).

When an individual is exposed to malignant stimuli that cause tissue damage, the automatic response is to withdraw or escape the sensation. Thus through negative reinforcement, avoidance of adverse stimuli will increase. Contrastingly, positive reinforcement from social factors such as family support or financial stability through disability benefits can also lead to decreased motivation for recovery. Cognitive factors of pain suggest that a person's perception of pain is their reality and such appraisals and beliefs become critical for the prognosis of treatment. Certain beliefs may lead to maladaptive coping strategies and greater disability. Studies show that patients who attribute pain to a worsening degree will report more pain than patients with benign interpretations (Spiegel & Bloom, 1983). Awareness of the etiology of pain

and the Biopsychosocial factors that influence the potency of pain can lead to changing an individual's interpretation of pain. Subsequently, chronic pain patients who fail to develop insight into their cognitions and behaviors associated with pain may engage in greater medication seeking behaviors and potentially lead to abuse patterns (Geisser et. al., 1999).

Furthermore, the likelihood to misuse pain medication has been a common theme of discussion in recent literature. One of the goals in reducing prescription pain medication misuse is to prevent further secondary complications (e.g., organ dysfunction) to a patient's chronic pain. Another goal for tapering pain medication use is to reduce the tolerance effect that is typically associated with assimilation to usage, which creates a need for increased dosage. Thus it becomes necessary to understand the factors that contribute to the likelihood to abuse pain medication. The biomedical model suggests that the physical sensation of pain drives individuals to seek relief from symptoms. The Biopsychosocial perspective advocates for an integration of various factors to explain the experience of pain and the behaviors that follow. Through this study we will examine the self-report of patient's physical and mental status to determine contributors to the pain experience that may lead to a greater likelihood to misuse pain medication. Furthermore, we will analyze the association between self-perceived mental health and their PMQ score vs. self-perceived physical health to determine predictors of pain medication misuse.

CHAPTER TWO

Review of the Literature

Overview

Theories of Pain

The etiology of pain stems from a physiological and psychological event composed of the synergy between organs, neurotransmitters and human perception of pain. Pain is not only a sensory reaction to malignant stimuli but also a cognitive framework that develops into a learned behavior. Signals from sensory nerves in the presence of malignant stimuli are transferred to ensure cognitive structuring for future avoidance but in some cases impairing the somatosensory system. Neuropathic pain development requires more treatment variation including analgesics and coanalgesics to effectively reduce symptoms (Caraceni, A., Martini, C., Zecca, E., & Portenoy, R. K. 2004). It is estimated that neuropathic pain features are common in the majority of chronic pain patients (Torrance, N., Smith, B., Bennett, M., & Lee, A. 2006).

Nociception is the stimulation of nerves that communicate the damage of tissue to the brain. Pain is a subjective response to sensory input that is shaped through a person's current psychological status. Nociception can be described as nerve communication from potentially injured tissue. Interestingly, nociception can be present with or without perceptual experience of pain. For example, an individual may not experience the sensation of pain until they visibly notice a site of injury, which reinforces the perception of pain. Similarly, an individual can experience the sensation of pain even without nociception being present (Loeser, 1982). Such as when a limb has been amputated and an individual still experiences the sensation of pain that is called phantom limb pain. Other factors can contribute to the perception of pain such as biological pain tolerance, mental status, and sociocultural influence.

Psychological variables influence appraisals and perception of physiological signs. The Gate Control Theory of Pain presents psychological factors as an integral part of experiencing pain (Melzack, 1996). Although pain is initially regarded as a reflex to malignant stimuli the sensation can be modified to produce a less adaptive reaction. The GCT invokes a constant interaction of sensory systems as well as affect, cognition and behavior thus shaping the experience of pain to be interactive. The activation of the Central Nervous System in a pain process involves perception of the event thus eliciting integration of psychological variables such as cognition, learning, attention, and memory as well as behavioral variables such as avoidance.

Biopsychosocial Model of Pain

In order to accurately conceptualize the experience of pain, recent research has adopted a Biopsychosocial perspective of pain. (Gatchel, Peng, Peters, & Turk, 2007). The Biopsychosocial Model represents evolution from previous models that failed to incorporate a comprehensive system for explaining pain experiences (Engel, 1977). Contrastingly, biomedical models focused on attributing pain exclusively to physiological factors. However, a patient's pain experience cannot be fully explained by measures of nociceptive damage. Biological, psychological and environmental aspects of the pain experience work symbiotically. Psychological aspects of pain can include rumination of pain, depression, anxiety and with importance to this study; substance abuse. The psychological impact of chronic pain and its association to substance abuse is crucial in determining treatment outcomes. A patient's cognitions regarding their pain and overall mental health status play a role in pain behaviors such as actively seeking medication and leading to abuse patterns. Furthermore, evaluation of psychopathology could lead to understanding the association between chronic pain and opioid abuse.

The Biopsychosocial model proposes to evaluate patients from an interdisciplinary approach that takes into account psychological, societal, and cultural influences rather than focusing on physiological damage. Subsequently, assessments that include various influences in understanding pain are needed in order to effectively target treatment (Gatchel, et al., 2007). Instruments that measure psychological factors that affect treatment outcomes can include evaluating a patient's pain-related thinking patterns as well as their overall mental health status.

Effects of Chronic Pain

Physical impairment due to chronic pain has a variety of factors that influence level of disability. Gatchel (2004) found that occupational functioning is significantly impaired due to chronic pain. Missed days of work, mobility, and productivity on the job are all secondary effects of chronic pain that can lead to financial burdens. Education level and income has found to be a strong predictor of functional disability as well as a prognostic factor in recovery. (Deyo & Tsui-Wu, 1987) It can be argued that the level of education correlates with the income generated. Depending on the strenuous labor that is performed on a job site is at times inversely related to the amount of income generated. Furthermore, a person with limited education will typically work for a lower paying job with a higher demand on physical labor.

Chronic pain affects 2% to 45.6% of the world's population (Breen, 2002). Chronic pain is the leading cause of disability and unemployment in the country. Specifically, lower back pain has been reported as the most costly disability (Dolce & Raczynski, 1985). Thus management and rehabilitation of chronic pain should be extensively examined to educate health professionals on the most cost-effective treatment option. Studies indicate a substantial amount of practicing physicians feel incompetent in treating patients with chronic pain (Darer et. al, 2004). The sensation of overall dissatisfaction and inexperience treating chronic pain patients is heightened

when physicians and medical students feel uncertainty about their diagnosis and interpretation of pain severity thus developing more negative attitudes towards treatment. (Merrill, et.al, 1992) According to Straus, it is estimated that costs for treatment of one patient with chronic pain ranges from $9,000 to $19,000 per year. Aside from affecting employment, chronic pain produces negative side effects in a patient's life including daily functioning, psychological and social health (Gerstle, et.al, 2001). In order to help patients manage their pain, health professionals must understand the etiology of their discomfort to treat and rehabilitate. The American Academy of Pain Management reports that chronic pain is a prevalent problem as well as a costly problem. It is estimated that Americans spend more than $70 billion dollars per year on healthcare costs. It is important to consider noncompliance and medication misuse can contribute to prolonging medical care thus amplifying health care costs (Simmons et. al, 1988).

Mental Health

Chronic pain is not only a physically debilitating condition but can also affect the mental health of an individual. The experience of persistent pain is presumed to affect mood, cognition, and emotion, which are reflective of a person's health. Studies suggest there is a connection between psychological distress and healthcare outcomes (Sobel, 1995). Notably, developing a sense of hopelessness is found to be a substantial obstacle in treatment for patients with chronic upper extremity joint pain (Howard & Howard, 2012). Gatchel (1996) advocates for thorough psychological evaluation to reveal psychopathology that may interfere with treatment of chronic pain. Furthermore, taking into account other psychological factors such as cognitions of pain, affect in relation to pain, depression, anxiety and substance abuse. There is a connection between certain personality disorders such as individuals with histrionic, dependent, paranoid and borderline traits that are more likely to endorse chronic pain symptoms (Dersh, et al., 2002).

Treatment for Chronic Pain

Along with the risks of dependency, misuse and self-medication there are several other adverse side effects accompanied with extensive opioid use. According to the American Pain Society and the American Academy of Pain Medicine a secondary treatment regime is needed to reduce the side effects of opioid therapy. The extensive use of medication results in deterioration of organs that are impacted by medication overuse (Chou R. 2009). Conclusively, chronic pain patients that are taking dosages defiant of their provider's instruction may further perpetuate their illness leading to further medication seeking behaviors. Respiratory depression, constipation, nausea and vomiting are common side effects of pain medications; symptoms may be exacerbated depending on the chronicity of use (Chou R. 2009).

Pain Medication Misuse

A cohort study by the National Institute of Public Health on chronic pain researches the role of pain medications in relation to recovery and mortality. They're findings suggest that the overuse of strong opioids were associated with poor quality of life as well as higher risk of death in comparison to individuals without chronic pain. The study also found that individuals using opioids were less likely to recover from chronic pain in comparison to individuals not using opioids (Sjorger, P., Gronbak, M., Peuckman, V., & Ekholm, O., 2010).

Research suggests there has been a substantial increase of 71% from the year 1997-2002 regarding the amount of pain prescriptions issued to patients. Gilson's study examined the frequency of medicinal uses of fentanyl, hydromorphone, meperidine, morphine, and oxycodone. Oxycodone was the most used throughout this time frame and increased significantly, 402.90% (Gilson, 2004 et al.). It can be implied that the over prescribing of pain medication is a direct result of patients' over use of their medication. Subsequently, research shows that patients who

abuse pain medications, specifically opioid analgesics are also likely to misuse other drugs. Patterns in behaviors of substance misuse are seen across drug types (Savage, 2004 et. al). It is feasible to predict that patients who develop a pattern of chronic pain medication abuse will also abuse other legal and illegal drugs. Evidence suggests that maladaptive behaviors such as opioid misuse can be influenced by emotional and behavioral adjustment to pain (Geisser et. al., 1999). Contemplation of the potential of pain medication abuse is often considered prior to prescription. Screening measures are typically used to predict the likelihood of opioid abuse (Butler et. al, 2004).

Patient quality of life is a valued factor in health care. Total or partial reduction of symptoms alludes to a patient's quality of life. Patients' report of their global health is essential in tailoring treatment plans. According to past studies, items that measure patients' global health illustrates a prognosis of recovery as well as health care utilization (Bjorner, J. B., Fayers, P. M., & Idler, E. L., 2005). Pain perceived by the patient is real and tangible in their opinion and should be treated in the most effective and expedited way to alleviate patients' discomfort. Initially relieving patient's symptoms is efficaciously resolved by administration of opioids or other medicinal agents that alleviate symptoms. According to The American Academy of Pain Medicine, there is an overall consensus that the majority of chronic pain patients require a medicinal form of treatment, either an opioid or non-analgesic to help chronic pain patients reduce symptoms (Clin. J., 1997). However, studies show that a prolonged effect of pain medication use can result in dependency and abuse of the medication (Chelminski, et. al, 2005).

Interdisciplinary Pain Program

Interdisciplinary Pain Programs are formed with the perspective of conceptualizing a patient's illness from a Biopsychosocial approach and encompassing treatment across

Biophysiological, psychological, and social factors. ID programs have a cohesive outlook of rehabilitation among providers that includes continual communication between providers and patients regarding treatment and prognosis for recovery. ID programs work collaboratively with various health care professionals (e.g., physical therapy, psychologists, physicians) to design patient tailored and cost-time effective pain program. Interdisciplinary treatment for chronic pain has empirical validity supporting its use (Gatchel & Okifuji, 2006; Turk & Swanson, 2007). The communication of the etiology of a patients' pain as well as the steps to rehabilitation are discussed among providers. Furthermore, addressing each aspect of aforementioned Biopsychosocial Model within a pain treatment regimen allows expertise of various healthcare professionals to target a singular disorder that manifests through a variety of symptoms.

The difference between an interdisciplinary program and a multidisciplinary program that also involves various health care providers that similarly target symptom reduction is the collaboration of the team to cohesively work in unison to combat a patient's illness (Noe & Williams, 2012). Typically ID programs involve the partnership of physicians, clinical psychologists, and physical therapists. Allied healthcare providers such as vocational rehabilitation counselors, nurses, research managers, nutritionists, chaplains, and case managers can sometimes be involved in treatment as well. Evidence shows that the availability of ID programs is contingent upon insurance coverage. Due to lack of coverage by some health insurance policies many individuals are not treated interdisciplinary thus a greater potential for error in treatment (Robbins, et al., 2003). Moreover, some aspects of ID programs such as psychotherapy or physical therapy are not completely covered or not covered at all by managed healthcare policies.

Summary

Chronic pain is a debilitating condition of physiological and psychologically encompassing etiology. Physicians find it difficult to treat such condition and tend to rely on pain medication prescription as a primary means of relieving patient suffering. The Biopsychosocial Model conceptualizes the illness from a heterogeneous approach. Interdisciplinary Chronic Pain Management programs reinforce the effectiveness of the model in understanding and treating pain. The Biopsychosocial Model provides understanding to the factors that are not addressed through singular medicinal treatment. The model also gives insight to the symbiosis of a person's perceived mental health and how it may differ from their physical health, which can lead to differences in behaviors. In order to appropriately address chronic pain from a psychological perspective measures are needed in understanding the association between mental health and pain behaviors. The present study aims to illustrate disparities between poor physical health and poor mental health shown in nonlinear differences in PROMIS mental health and PROMIS physical health scores. Secondly this study will provide an assessment of the predictive value of a person's mental health status vs. their physical health status assessed through the two-factor model of the PROMIS global health measure with respect to scoring higher on the PMQ suggesting greater likelihood to abuse pain medication in relation to an inverse endorsement of a deteriorated health status. The results from this study will produce empirical advancements that will help to emphasize mental health status as a factor in the pain experience and pain behaviors that may influence pain medication misuse, thus, persuading providers to treat chronic pain from a psychological perspective in conjunction with medicinal treatment that addresses physical relief.

Aim

The overall aim of the current study is to reinforce the clinical use of the Biopsychosocial Model specifically incorporating Global Health Status PROMIS and PMQ as valuable tools in efforts to identify predictive factors of prescription pain medication misuse through assessing psychological and physiological elements. The specified aim is to examine the relationship between patients' self-report of physical health and mental health. Subsequently, to determine predicative variables of prescription pain medication misuse; in regard to their Pain Medication Questionnaire score based on the association between participants' self-perceived mental health and physical health respectively.

Hypotheses

Hypothesis One

It is hypothesized that there will be a positive correlation between the PROMIS Global Mental Health score and the PROMIS Global Physical Health Score. By running a simple correlation and graphing the data sets singularly and together will demonstrate a strong linear relationship. The Global Mental Health score is generated by summing responses to Global02, Global04, Global05, and Global10 rescored. Global Physical Health score is generated by summing responses to Global03, Global06, Global07 rescored, and Global08 rescored. Global 02, Global03, Global04, Global05 and Global 06 are measured by a five-point selection response (i.e., 1=Poor, 2=Fair, 3=Good, 4=Very good, 5=Excellent) Global 07 is recoded so that high scores reflect better functioning.

Hypothesis Two

It is hypothesized that there will be significant variance of PMQ (Pain Medication Questionnaire) accounted for by the "physical health status" assessed using PROMIS Global Physical Health Score as a predictor of PMQ. Furthermore, through running a hierarchical

multivariate regression using PMQ as the dependent variable and using the physical health scores as a predictor variable. Subsequently, when adding PROMIS Global Mental Health as an additional predictor to the model for PMQ will produce a similar variance effect. In order to determine if either variable increases the predictability of PMQ, a multimodal analysis will be explored. It is hypothesized that PROMIS Global Mental Health when analyzed with Physical Health will also increase the predictability effect of PMQ. The variables of gender and age will be added as later steps of a hierarchical multivariate regression to test if they increase the fit of the model to better predict PMQ as a dependent variable and whether or not they're significant within the model itself. It is hypothesized that gender and age will not significantly improve the model and will not be significant predictors when examined individually.

CHAPTER THREE

Method

Study Design

Setting

The participant data was collected at the outpatient pain clinic; Eugene McDermott Center for Pain Management (EMCPM). The EMCPM is part of The University of Texas Southwestern Medical Center, located in Dallas, Texas. The EMCPM adopts an interdisciplinary pain management program, as its primary treatment for chronic pain as well as pain management through physician care and/or physical therapy. Data collected for this study was acquired from all patients who were evaluated including those selected for the Interdisciplinary Pain Program and those who may have received a different type of pain management care. Selection criteria to the interdisciplinary pain program are dependent upon evaluation of a patient's medical records by the attending physicians. The International Review Board of the University of Texas Southwestern Medical Center monitored the collection of data and its use.

Participants

The final sample included data from males and females admitted into the Interdisciplinary Pain Program at the EMCPM at UT Southwestern Medical center. As the McDermott Pain Clinic does not typically provide care for children and adolescents (<18 years), children and adolescents were excluded from the present study. The test groups consisted of participants between 18 and 90 years of age as referred to treatment by psychologists, Dr. Travis Whitfield and Dr. Richard Robinson of UT Southwestern and capable of providing informed consent, able to read and speak English, experiencing non-malignant pain-related problems, and willing to allow access to their electronic medical records. The racial demographics of all

participants were controlled by acquiring participants from various ethnic backgrounds, however due to location of sampling it is noted that the majority of participants fell into three main categories; Caucasian, Hispanic, and African American. Ethnicity and race will not be directly measured in this study but will be discussed in the sample size and demographics section.

The PMQ and PROMIS Mental Health bank are not available in alternative languages thus; non-English speaking patients will be excluded from the study. Moreover, patients who are physically unable or unwilling to complete the measures were excluded from the study. Patients will be informed that declining to participate will not adversely affect the treatment received at McDermott Pain Clinic at UTSW.

Measures

Patient Reported Outcomes (PRO)

Patient reported outcomes (PROs) are a tool used to obtain a more accurate interpretation of a patient's perspective of pain, illness, and treatment efficacy. PROs are Self-completed questionnaires assessing a patient's health interference and illness (Fitzpatrick et al. 1998). The PRO measures aim to enhance the patient's skills in communicating with their provider.

Assessment Center is an online database that is funded by the NIH-funded Patient-Centered Outcomes Research Institute (PROMIS), which, stores, organizes, and manages PROs (Gershon, et al., 2010). The measures in Assessment Center are empirically validated comprehensive self-report items. The clinical utility of such measures allow health care providers to time-effectively assess patients without risk of biased responding due to interviewer influence.

PROMIS measures

The National Institute of Health started the Patient-Reported Outcomes Measurement Information System (PROMIS) to develop item banks that effectively measure symptoms across

chronic illnesses. PROMIS derived measured have shown to be consistently reliable and valid across testing. (Cella, et al., 2007) The self-report measure allows interpretable data to become available in clinical practice to use for treatment planning. The PROMIS item banks use an "In the past 7 days" time frame reporting reference in regards to a five-point selection response (i.e., 1=Poor, 2=Fair, 3=Good, 4=Very good, 5=Excellent). Other items on the PROMIS Global Health Short-Form rating average pain uses an 11-point response scale (i.e., 0=No pain to 10=Worst imaginable pain). PROMIS is used to enhance precision, minimize tedious responding methods, and improve the comparison to other health related measures. (Rose M, Bjorner JB, Becker J, Fries JF, Ware JE, 2008) Overall, PROMIS was comprised to establish a standardize assessment system to increase clinician reliability in evaluating patient symptoms across illnesses.

PROMIS v.10/1.1- Global Health Scale

Items on the PROMIS Global Health SF use a two-factor model to measure current mental health and overall physical health and functioning. An advantage of using the Global Health SF is the brevity to complete in comparison to the SF-36. The global health items are self appraisals of general health that comprise an overall health status as opposed to assessing specific health concerns. (Hays, R. D., Bjorner, J., Revicki, R. A., Spritzer, K. L., & Cella, D., 2009) The PROMIS global health items include pure mental health rating that assess mood and ability to think as well as a pure physical health rating (Hays, R, et al., 2009). The item bank allows clinicians to obtain an overall mental health score and physical health score by summing their respective items. Summing responses to Global02, Global04, Global05 and Global10 rescored generates the Global Mental Health score. Summing responses to Global03, Global06, and Global07 rescored, and Global08 rescored generates global Physical Health score. Global 02,

Global03, Global04, Global05 and Global 06 are measured by a five-point selection response (i.e., 1=Poor, 2=Fair, 3=Good, 4=Very good, 5=Excellent) Global 07 is recoded so that high scores reflect better functioning (i.e., 0=No pain to 10=Worst imaginable pain) (Hays, R.D., Bjorner, J., Revicki, R. A., Spritzer, K. L., & Cella, D., 2009).

PMQ (Pain medication questionnaire)

This measure assesses the *current level of risk* for potential misuse of prescription opioid medication. The self-completed survey consists of twenty-six assessment items. The patient responses are scored on a five-point Likert scale. Risk categories include: Low risk (0-20), Moderate risk (21-20) and High risk (31+). Scores in the high-risk categories can be interpreted as endorsing likelihood for substance abuse, poor functioning and high psychological and social distress. Patients who fall in the lowest group 0 to 34 have a minimum potential of opioid abuse. (Adams, et al., 2004)

IRB Consent forms, HIPPA forms, Research Laptop with Internet access to complete questionnaires. Participants used Assessment Center to complete the self-report measures. Assessment Center is an online database that will collect the index scores of the Pain Medication Questionnaire, SF-36, and PROMIS Bank v1.0/1.1 – Global Health Scale.

Procedures

Data for this study was collected at the McDermott Pain Clinic at the University of Texas Southwestern Medical Center. Due to the restrictive policies of the UTSW patient system as well as HIPPA laws, prior to administration of assessments all participants provided written consent to participate. Examiners completed extensive trainings regarding patient confidentiality through CITI program as well as EPIC. All participants were informed there would be no compensation for their participation. All participants completed the PROMIS Global Health Scale, Pain

Medication Questionnaire as well as a series of other self-report assessments that were not used for this study. Each assessment was self administered individually and electronically through the Assessment Center database. There was no time limit for completing the assessment, however most participants completed testing within 30-45 minutes.

Statistics

The data was analyzed using SPSS software. The final sample size included 206 participants due to variance in N attributed to non-completion of measures. Running initial tests of frequency and normal distribution were used to determine the parameters of the data set. Subsequently, running a simple correlation and graphing the data sets singularly and together was done to demonstrate the type of relationship between PROMIS global mental health and physical health scores. Furthermore, running a hierarchical multivariate regression using PMQ as the dependent variable and using the mental health and physical scores as predictor variables was also used. Additionally, gender and age were added as later steps of the hierarchical multivariate regression to see if they increase the overall fit of the model to better predict PMQ as a dependent variable and whether or not they're significant within the model itself.

Aim

The overall aim of the current study is to reinforce the clinical use of the Biopsychosocial Model specifically incorporating Global Health Status PROMIS and PMQ as valuable tools in efforts to identify predictive factors of prescription pain medication misuse through assessing psychological and physiological elements. The specified aim is to examine the relationship between patients' self-report of physical health and mental health. Subsequently, to determine predicative variables of prescription pain medication misuse; in regard to their Pain Medication

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CHAPTER FOUR

Results

Sample Size and Demographics

The sample size for the current study included 206 participants. Included in the sample group were all participants who completed the baseline time-point measures. Various factors contributed to variance in *n*, including participant non-completion of items within the PROMIS measures and PMQ. Participants (adult outpatients who were initiating care or receiving ongoing care at EMCPM) were asked to complete various measures centered on their perception of pain, medication use, and other demographic and historical measures regarding the patient's pain experiences. Study personnel using the PROMIS-based web resource "Assessment Center" accessed these measures online. The instruments utilized for the current study were the Pain Medication Questionnaire, PROMIS Global Health Measure as well as demographic questions taken from other measures to aid in the illustration of the clinical sample.

As part of the evaluation upon intake of being treated at the EMCPM, participants are asked to answer information regarding their current experience of pain, psychiatric diagnosis, frequency of physical exercise and questions about disability benefits. This information was collected for purpose of conceptualizing a treatment plan for the patients admitted. The information is relevant in communicating the clinical presentation of the participants in this current study. In assessing the participants current pain upon intake, the greatest frequency of pain reported from a scale of 0-10 where 0=no pain and 10=worst pain most individuals reported their pain to be 7. Notably, when participants were asked to rate their average weekly pain from a scale of 0-10 where 0=no pain and 10=worst pain, the largest frequency also fell at 7 suggesting their pain to be consistently distressing. Participants were also asked whether they

have received a prior psychiatric diagnosis, 62.3% of individuals reported they had not received a psychiatric diagnosis. When asked about participants' frequency and regularity in exercise regime, 72.2% of the 206 participants reported they do not exercise frequently. Furthermore, to investigate the level of impact their pain has on their employability, participants were asked whether they were currently receiving disability benefits due to their pain. Overall, 67.8% participants reported they are currently receiving disability benefits.

Further demographic data reported here represents information obtained at baseline. By gender, there were 72.22%females and 27.78% males. The larger frequency of females in this cohort is consistent with literature that states there are more women who report conditions of chronic pain. The study sample consisted of Caucasian (55.8%), Black (12.8%), Asian (1.2%), American Indian or Alaska Native (0.24%), Native Hawaiian or Other Pacific Islander (0.48%), and 2.4% of participants who described themselves as other. In terms of ethnicity 60.63% were Not Hispanic or Latino, 7.49% were Hispanic and Latino, and 31.88% did not provide data on their ethnicity. The mean age of the participants in this overall sample was 51.30 (SD= 16.91), and the ages ranged from 18 to 86 with the greatest frequency falling at 49 years of age.

Statistical Analyses

Mean score for the PMQ at baseline was 24.39 (Min: 5 and Max: 71). The mean score for the PROMIS-Global Mental Health Score was 40.48 (28.40-53.30). The mean score for PROMIS-Global Physical Health Score was 36.73 (23.50-54.10). Given the norms for the chronic pain population, the current sample demonstrated endorsement of fair mental health and physical impairment. Initially we ran the statistical analysis using the raw scores of PROMIS Physical and Mental health, the results are as follows: The data set was graphed to show the frequency and distribution of the PMQ total, PROMIS mental health score, and PROMIS

physical health score, respectively. The histogram appeared to illustrate a normal distribution for PMQ scores and PROMIS mental health scores but not for the PROMIS physical health data set. Subsequently, taking a closer look at the distribution through tests of normality, it was found that none of the data sets were within parameters as the Shapiro-Wilk test was significant shown by the value of $p<.001$. Furthermore the relationship of PROMIS physical health and PROMIS mental health made evident through scatter plots was shown to have a weak relationship.

Raw Score Analysis

A nonparametric multivariate linear regression analysis was performed to determine how well participants' self-report of their physical health (PROMIS Physical health score) predicted the likelihood to abuse prescription opioid medication (high PMQ score). As shown in Table 1 the regression analysis revealed that "physical health scores" were not significant in the amount of variance, adjusted $r^2=.006$, $F(1,205) =2.334$, $p<.128$. The regression analysis also revealed that within the model the variable "physical health score" did not account for a significant amount of variance in the "likelihood to predict prescription pain medication misuse", standardized $\beta=-.106$, $t (205) =-1.528$, $p=.128$.

A predictor variable of participants' self-report of mental health (PROMIS mental health score) was added to the model of participants' self-report of their physical health (PROMIS Physical health score) to determine any change in variance in predicting the likelihood to abuse prescription opioid medication (high PMQ score). The regression analysis revealed that a combination of the variables "physical health scores" and "mental health score" accounted for a significant amount of variance in the variable "likelihood to abuse opioids", adjusted $r^2=.062$, $F(2,205) =7.797$, $p<.001$. The regression analysis also revealed that within the model, the variable "mental health score" accounted for a significant amount of variance in "likelihood to

predict prescription pain medication misuse", standardized β=-.262, t (205) =-3.622, p<.001. Whereas the predictor variable, "physical health scores" was not significant within the model, rendering standardized β=-.013, t (205) =-.186, p=. 853.

Additionally, age and gender variables were added to the raw score model to examine a stronger fit and significance of predictability. Multivariate linear regression analysis was performed to determine how well the combination of participants' self-report of physical health (PROMIS Physical health score), mental health self-report (PROMIS mental health score), age and gender predicted the likelihood to predict prescription pain medication misuse (high PMQ score). Given that 72% of the participants were female, gender variables were coded as a 1 for males and a 0 for females to establish a baseline. The regression analysis revealed that a combination of the variables "PROMIS physical health scores", "PROMIS mental health score", age and gender accounted for a significant amount of variance, adjusted r^2=.070, F(4,205) =4.839, p<.001, at the .05 level of significance. Although the model becomes stronger with the added predictor variables, the regression analysis revealed that within the model, the variable "physical health score" did not account for a significant amount of variance in prescription opioid abuse, standardized β=-.004, t (205)=-.061, p=.952. The model also revealed that age and gender did not account for a significant amount of variance in the likelihood to predict prescription pain medication misuse, where the age variable demonstrated standardized β=.012, t (205) =.174, p=.862 and gender variable demonstrated standardized β=.129, t (205) =1.906, p=.058. Interestingly, the variable "Mental health score" continued to be significant in the amount of variance predictability of prescription opioid abuse, β=-.262, t (205) =-.3.603, p<.001.

T-Score Analysis

In order to further examine the relationship of the predictor variables we converted the raw scores of the PROMIS Mental and Physical health into their respective t-scores (Hays, R.D., Bjorner, J., Revicki, R. A., Spritzer, K. L., & Cella, D., 2009). The data analysis is as follows: Similarly to the analysis of raw scores, the data set was graphed to show the frequency and distribution of the PMQ total, PROMIS mental health score, and PROMIS physical health score, respectively. The histogram appeared to illustrate a normal distribution for PROMIS mental health scores and for the PROMIS physical health data set however, there were evident outliers found in the distribution of PMQ scores. Subsequently, taking a closer look at the distribution through tests of normality, it was found that none of the data sets were within parameters as the Shapiro-Wilk test was significant shown by the value of $p<.001$.

An examination of the scatter plots suggested the presence of weak linearity between PROMIS physical health and PROMIS mental health. However, all of the variables' respective data sets were outside of the limits of normality. Accordingly, nonparametric procedures were utilized to show the relationship between the variables. A nonparametric multivariate linear regression analysis was performed to determine how well participants' self-report of their physical health (PROMIS Physical health score) predicted the likelihood to predict prescription pain medication misuse (high PMQ score). As shown in Table 2 the regression analysis revealed that "physical health scores" were not significant in the amount of variance, adjusted $r^2=.006$, $F(1,205)=2.303$, $p=.131$. The regression analysis also revealed that within the model, the variable "physical health score" did not account for a significant amount of variance in the "likelihood to predict prescription pain medication misuse", standardized $\beta=-.106$, $t(205)=-1.517$, $p=.131$.

A predictor variable of participants' self-report of mental health (PROMIS mental health score) was added to the model of participants' self-report of their physical health (PROMIS Physical health score) to determine any change in variance in predicting the likelihood to predict prescription pain medication misuse (high PMQ score). The regression analysis revealed that a combination of the variables "physical health scores" and "mental health score" accounted for a significant amount of variance in the variable "likelihood to predict prescription pain medication misuse", adjusted r^2=.062, F(2,205) =7.744, p<.001. The regression analysis also revealed that within the model, the variable "mental health score" accounted for a significant amount of variance in "likelihood to predict prescription pain medication misuse", standardized β=-.261, t (205) =-3.612, p<.001. Whereas the predictor variable, "physical health scores" was not significant within the model, standardized β=-.051, t (205) =-.206, p=.837.

Additionally, age and gender variables were added to the model to examine a stronger fit and significance of predictability. Multivariate linear regression analysis was performed to determine how well the combination of participants' self-report of physical health (PROMIS Physical health score), mental health self-report (PROMIS mental health score), age and gender predicted the likelihood to predict prescription pain medication misuse (high PMQ score). Similar to the raw score data set, gender variables were coded as a 1 for males and a 0 for females to establish a baseline. The regression analysis revealed that a combination of the variables "PROMIS physical health scores", "PROMIS mental health score", age and gender accounted for a significant amount of variance, adjusted r^2=.069, F(4,205) =4.812, p<.001, at the .05 level of significance. Although the model becomes stronger with the added predictor variables, the regression analysis revealed that within the model, the variable "physical health score" did not account for a significant amount of variance in likelihood to predict prescription

pain medication misuse, standardized β=-.006, t (205)=-.078, p=.938. The model also revealed that age and gender did not account for a significant amount of variance in likelihood to predict prescription pain medication misuse, where the age variable demonstrated standardized β=.012, t (205) =.174, p=.862 and gender variable demonstrated standardized β=.129, t (205) =1.905, p=.058. Interestingly, the variable "Mental health score" continued to be significant in the amount of variance likelihood to predict prescription pain medication misuse, β=-.262, t (205) =-.3.594, p<. 001.

CHAPTER FIVE

Discussion

Following increasing attention to the increased amount of prescriptions used for chronic pain (Gilson, 2004 et al.) greater efforts are being investigated in treating and understanding patient symptoms, specifically controlling for secondary complications of medicinal treatments (e.g. prescription pain medication misuse). By adding to the developing literature on the PMQ's utility and comparison with newly established measures of global health outcomes, this study expands upon existing research and offers new clinically useful information in predicting prescription pain medication misuse.

In order to aid clinicians in understanding the unique symptoms in chronic pain patients, there have been a variety of self-report measures that have been employed to facilitate communication of a patient's distress. The NIH-funded PROMIS measures were developed to evaluate and compare a range of health-related outcomes. The Pain Medication Questionnaire is an important and increasingly utilized measure that has helped in assessing for abuse risk of pain medication. Extensive research is lacking in examining the relationship of PROMIS Global Health measure in relation to PMQ score prediction. In accordance with continued attention of self-report measures, the current study attempted to examine the psychometric performance of the PROMIS Global Health measures as compared with another measure of pain related behavior. More specifically, the study was designed to investigate and compare the predictive validity of the PROMIS Global Mental Health Score and PROMIS Global Physical Health Score in terms of Biopsychosocial outcomes in a chronic pain population as predictors of prescription pain medication misuse. The results indicate that the PROMIS Global Health measures demonstrated strong performance in multiple areas including construct validity and

Biopsychosocial outcome prediction. Overall, the PROMIS Global Mental Health score was found to be a strong individual predictor of potential to misuse pain medication where as the PROMIS Global Physical Health score helped improved the overall fit of the predictive model.

Study Findings

The overall two-factor model of the PROMIS Global Health measure demonstrated large effect sizes with respect to its association with the Pain Medication Questionnaire. However, there were weak correlations than expected between the PROMIS Global Mental Health Score and PROMIS Global Physical Health score. Although data in the literature strongly suggests an association between mental health and physical health status the finding in this study may be due to the disparity in mental functioning vs. physical functioning as more participants reported greater physical distress than mental distress. The PROMIS Global Mental Health score was found to be a strong predictor of PMQ scores suggesting a strong correlation between deteriorated mental health and a greater risk of the likelihood to predict prescription pain medication misuse.

The second hypothesis, examining PROMIS Global Physical Health score as a significant predictor of the likelihood to predict prescription pain medication misuse, was supported by the data. However, when looked independently as a single predictor PROMIS Global Physical Health score did improve the overall fit of the model. This predictive efficacy may be better explained by other psychosocial factors that are encompassed within the context of physical health. Similarly, after controlling for mean group differences, the current study also demonstrated the ability of the PROMIS Global Mental Health score to predict the likelihood to predict prescription pain medication misuse and additionally contributed significantly to the overall fit of the model. When examining age and gender as predictors in assessing risk in

predicting prescription pain medication misuse; they were also found to improve the overall fit of the model but not found to be significant predictors when examined individually. The complex interconnections between biophysiological and psychosocial aspects of pain require assessment from more than just a biomedical viewpoint. Taken collectively, these are important findings as they potentially may identify patients that would potentially worsen through medicinal treatment due to their vulnerability in risk for abuse. For example, providers could use the PROMIS Global Health measure as an evaluative tool to help highlight psychophysical barriers to treatment.

This study is innovative in assessing the PROMIS Global Mental Health score's predictive abilities compared with other established measures of pain related behavior. As such, it provides a unique opportunity to consider its relative performance in a research and clinical setting. The results found in the current study compliment previous studies on the physical and psychological factors' predictive utility. Further, results demonstrate the clinical application of the PMQ and PROMIS-based outcome measures.

Limitations

The current study featured only baseline data, thus there was a limited picture in assessing predictability and whether or not the relationship between variables would strengthen post IPP treatment. There is also a potential confound in the sample cohort given that the participants included were only treatment-resistant chronic pain patients referred to the IPP at EMCPM thus may not represent an accurate depiction of most chronic pain patients. Pain patients with a more acute onset may respond differently to the PROMIS Global Health Status measure and PMQ. However, the current study's sample matches well with the chronic pain demographics in past literature (Gatchel, et al., 1995). Additionally, the study only used data from one pain management clinic in Dallas, Texas. Responses may differ according to region.

As mentioned, there exist some limitations in the current study that provide room for improvement in future studies. Further analysis could be conducted in order to detect potential differences in health status reporting before and after IPP treatment in regards to their association with potential abuse. Additionally, using a control group that does not endorse chronic pain symptoms can be useful is examining the association of "healthy" group as a baseline in evaluation PROMIS global health status. Using the PMQ in clinical settings when treatment planning could also lead to potential gains in understanding risk factors associated with abuse for that specific patient.

Future Implications

Future research can evaluate the predictive validity of the PROMIS Global Mental Health in other types of treatment settings (e.g., primary care, inpatient settings, etc.). As the current study cohort was comprised exclusively of patients reporting non-malignant pain, additional consideration should be provided to evaluating the utility of the PROMIS Global Mental Health in a patient population with cancer-related chronic pain conditions or other autoimmune conditions. Comparisons with other established measures of health outcomes in these specific settings could, in conjunction with the current study, also add to the existing literature on the utility of the PMQ.

Summary

The results in the current study suggest that the PROMIS mental health score is a significant predictor of the likelihood to abuse opioid medication. Although the predictor variables of PROMIS physical health, age and gender improved the overall variance of the model when examined as single predictors they were shown not to be significant. The first hypothesis was not supported as shown by the weak linearity in the scatter plots of PROMIS

physical and PROMIS mental health scores. Surprisingly, the strength of the relationship of physical and mental health scores was not significantly correlated despite support in the literature; however, this may be due to sampling limitations. The second hypothesis was supported through findings that suggest PROMIS mental health score is a strong predictor of participants' PMQ score. Although PROMIS physical, age and gender improved the overall fit of the model their *p* values were not found to be significant when examined within the model. The latter part of hypothesis two that suggested age and gender would not be significant predictors of PMQ was supported, as their p-values found were .862 for age and .058 for gender, respectively. One could argue that age and gender aide in the predictability of the potential to abuse pain medication however the disparity in variance within this sample suggests that it is not a significant predictor.

Overall, the current study achieved its stated goals of evaluating the predictive utility of the two-factor model of PROMIS Global Health in comparison with the PMQ. The current study offers an important contribution to understanding and evaluating chronic pain and the multifaceted nature of Biopsychosocial outcomes. It is anticipated that future clinical research will continue to expand upon the implications from this study and contribute to more effective evaluation and treatment for individuals suffering from chronic pain as well as aide in understanding biopsychological factors in opioid abuse.

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Table 1

Raw Score Output: Multivariate Linear Regression Analysis

ANOVA			
Model Levels	df	F	Sig.
1. DV: PMQ IV: Physical Health Score	1	2.334	.128
2. DV: PMQ IV: Physical Health Score, Mental Health Score	2	7.797	.001
3. DV: PMQ IV: Physical HS, Mental HS, Gender, Age	4	4.839	.001

Note. DV = Dependent variable, IV = Independent Variables/Predictors, df = degrees of freedom

Table 2

T-Score Output: Multivariate Linear Regression Analysis

ANOVA			
Model Levels	df	F	Sig.
1. DV: PMQ IV: Physical Health Score	1	2.303	.131
2. DV: PMQ IV: Physical Health Score, Mental Health Score	2	7.744	.001
3. DV: PMQ IV: Physical HS, Mental HS, Gender, Age	4	4.812	.001

Note. DV = Dependent variable, IV = Independent Variables/Predictors, PMQ = Pain Medication Questionnaire, df = degrees of freedom

Table 3

Raw Score Output: Multivariate Linear Regression Analysis

Coefficients			
Model Levels	β	t	Sig.
1. Model		8.033	.000
Physical Health Score	-.106	-1.528	.128
2. Model		9.027	.000
Physical Health Score	-.013	-.186	.853
Mental Health Score	-.262	-3.622	.000
3. Model		7.509	.000
Physical Health Score	-.004	-.061	.952
Mental Health Score	-.262	-3.603	.000
Gender	.129	1.906	.058
Age	.012	.174	.862

Note. β = standardized Beta, t = t-score, Sig. = p-value

Table 4

T Score Output: Multivariate Linear Regression Analysis

Coefficients			
Model Levels	β	t	Sig.
1. Model		6.419	.000
Physical Health Score	-.106	-1.517	.131
2. Model		7.528	.000
Physical Health Score	-.015	-.206	.837
Mental Health Score	-.261	-3.612	.000
3. Model		6.751	.000
Physical Health Score	-.006	-.078	.952
Mental Health Score	-.261	-3.594	.000
Gender	.012	1.905	.058
Age	.129	.172	.864

Note. β = standardized Beta, t = t-score, Sig. = p-value

Appendix A

Measures

PMQ PAIN MEDICATION QUESTIONNAIRE© ***NAME:*** _____

In order to develop the best treatment plan for you, we want to understand your thoughts, needs and experiences related to pain medication. Please read each statement below and indicate how much it applies to you by marking your response with an "X" anywhere on the line below it.

1) I believe I am receiving enough medication to relieve my pain.

Disagree *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree*

2) My doctor spends enough time talking to me about my pain medication during appointments.

Disagree *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree*

3) I believe I would feel better with a higher dosage of my pain medication.

Disagree *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree*

4) In the past, I have had some difficulty getting the medication I need from my doctor(s).

Disagree *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree*

5) I wouldn't mind quitting my current pain medication and trying a new one, if my doctor recommends it.

Disagree *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree*

6) I have clear preferences about the type of pain medication I need.

Disagree *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree*

7) Family members seem to think that I may be too dependent on my pain medication.

Disagree *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree*

8) It is important to me to try ways of managing my pain in addition to the medication *(such as relaxation, biofeedback, physical therapy, TENS unit, etc.)*

Disagree *Somewhat Disagree* *Neutral* *Somewhat Agree* *Agree*

(Please continue on the next page)

9) At times, I take pain medication when I feel anxious and sad, or when I need help sleeping.

Never *Occasionally* *Sometimes* *Often* *Always*

10) At times, I drink alcohol to help control my pain.

Never *Occasionally* *Sometimes* *Often* *Always*

11) My pain medication makes it hard for me to think clearly sometimes.

Never *Occasionally* *Sometimes* *Often* *Always*

12) I find it necessary to go to the emergency room to get treatment for my pain.

Never *Occasionally* *Sometimes* *Often* *Always*

13) My pain medication makes me nauseated and constipated sometimes.

Never *Occasionally* *Sometimes* *Often* *Always*

14) At times, I need to borrow pain medication from friends or family to get relief.

Never *Occasionally* *Sometimes* *Often* *Always*

15) I get pain medication from more than one doctor in order to have enough medication for my pain.

Never *Occasionally* *Sometimes* *Often* *Always*

16) At times, I think I may be too dependent on my pain medication.

Never *Occasionally* *Sometimes* *Often* *Always*

17) To help me out, family members have obtained pain medications for me from their own doctors.

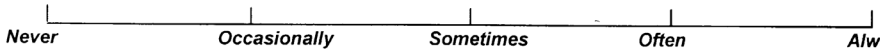
Never *Occasionally* *Sometimes* *Often* *Always*

18) At times, I need to take pain medication more often than it is prescribed in order to relieve my pain.

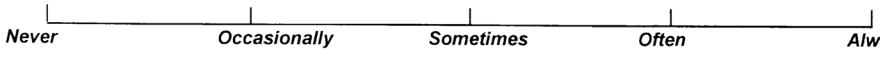
Never *Occasionally* *Sometimes* *Often* *Always*

(Please continue on the next page)

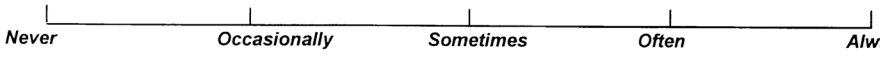
19) I save any unused pain medication I have in case I need it later.



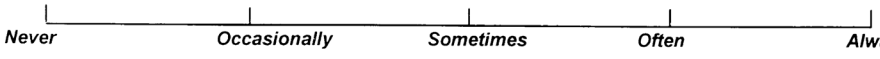
20) I find it helpful to call my doctor or clinic to talk about how my pain medication is working.



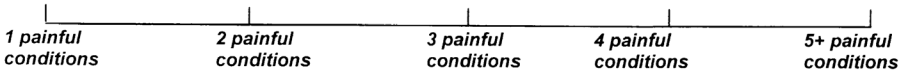
21) At times, I run out of pain medication early and have to call my doctor for refills.



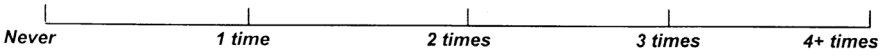
22) I find it useful to take additional medications *(such as sedatives)* to help my pain medication work better.



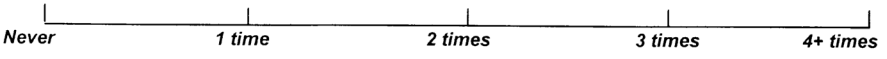
23) How many painful conditions *(injured body parts or illnesses)* do you have?



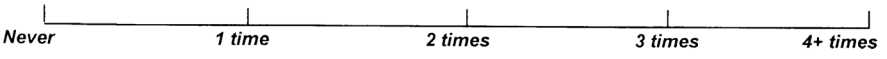
24) How many times in the past year have you asked your doctor to increase your prescribed dosage of pain medication in order to get relief?



25) How many times in the past year have you run out of pain medication early and had to request an early refill?



26) How many times in the past year have you accidentally misplaced your prescription for pain medication and had to ask for another?



(Stop)

BIOGRAPHICAL SKETCH

Gerardo Altamirano
gerardo.altamirano@mavs.uta.edu

EDUCATION/TRAINING *education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
The University of Texas at Arlington	B.A.	2011	Psychology/Spanish
The University of Texas Southwestern School of Allied Health Sciences	M.R.C	2014	Rehabilitation Counseling Psychology

Positions and Employment

Dinning Services Waiter
Del Frisco's Grille, Dallas TX 2013-2014

HIV Vaccine Research recruiter,
HIV/AIDS Research Unit, UT Southwestern Medical Center, Dallas TX 2012-2013

1st Grade Dual Language Teacher,
M.H. Moore Elementary, Ft. Worth TX 2011-2012

Clinical Experience

University Rehabilitation Services
Counseling Services, UT Southwestern Medical Center, Dallas TX 08/2013-08/2014

Supported Employment Services.
University Rehabilitation Services, UT Southwestern Medical Center,
Dallas TX 02/2014-08/2014

Neuropsychology Intern
Zale Lipshy University Hospital, UT Southwestern Medical Center,
Dallas TX 08/2013-02/2014