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The Effectiveness Of Brief Measures In Screening For Malingered Chronic Pain In A Primary Care Setting

Ande J. Seybert-Williams
Indiana State University

The Effectiveness of Brief Measures in Screening for Malingered Chronic Pain in a Primary Care Setting

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by

Ande J. Seybert-Williams, M.S.

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ANDE J. SEYBERT-WILLIAMS

EDUCATION

August 2019 — **Doctorate of Psychology in Clinical Psychology**
Indiana State University, Terre Haute, IN

December 2012 — **Master of Science in Clinical Psychology**
Morehead State University, Morehead, KY

May 2010 — **Bachelor of Science in Psychology with Concentration In Equine Assisted Learning**
Midway College, Midway, KY

May 2010 — **Associates of Arts in Equine Management with Minor in Business Administration**
Midway College, Midway, KY

SUPERVISED CLINICAL EXPERIENCE

June 2018 – present — **Tennessee Valley VA Healthcare System**
Clinical Neuropsychology Intern
Tennessee Valley VA Healthcare System
Nashville, TN

August 2017- May 2018 — **Graduate Clinician**
Vanguard Eldercare
Indianapolis, IN

July 2017- April 2018 — **Graduate Clinician**
Indiana University Health- Neuroscience Center
Indianapolis, IN

January 2016-June 2017 — **Graduate Geropsychology Clinician**
Union Hospital Lugar Center & Family Medicine Residency
Terre Haute, IN

August 2015 – August 2017 — **Graduate Clinician**
Indiana State University Psychology Clinic
Terre Haute, IN

August 2015 – May 2016 — **Graduate Clinician**
Indiana State University ADHD Evaluation Clinic
Terre Haute, IN

January 2015-May 2016	**Graduate Clinician** Meadows Manor East/Franciscan Union ACO Terre Haute, IN
May 2012- Aug 2012	**Outpatient Services Graduate Student Intern** Ridge Behavioral Health System Lexington, KY
January 2012-May 2012	**Graduate Student Intern** Morehead State University Counseling Center Morehead, KY
May 2011- Aug 2011	**Graduate Clinician** Kentucky Neuroscience Institute Lexington, KY

SUPERVISION EXPERIENCE

August 2017 – May 2018	**Peer Supervisor** Indiana State University Terre Haute, IN

RESEARCH EXPERIENCE

July 2018-Present	**Internship Research: Quality Improvement Project** Tennessee Valley VA Healthcare System
August 2015-May 2018	**Dissertation Research** Indiana State University Terre Haute, IN
July 2015-May 2018	**Neurophonemics Lab Research Assistant** Richard L. Roudebush VA Medical Center Indianapolis, IN
August 2014- May 2015	**Graduate Research Assistant** Indiana State University ADHD Clinic Terre Haute, IN
August 2013-May 2014	**Neuropsychology Lab Research Assistant** University of Kentucky Department of Psychology Lexington, KY

April 2011-August 2011	**Graduate Research Assistant** University of Kentucky Sander's Brown Center on Aging Lexington, KY
January 2011- May 2012	**Graduate Research Assistant/Thesis Research** Morehead State University Cognitive Psychopathology Laboratory Morehead, KY

SELECTED SEMINARS ATTENDED

April 2018	Behavioral and Lifestyle Interventions and Cognition in Older Adults 1 hour
	Cognitive Rehabilitation 1 hour
March 2018	The Aging Brain: Assessments, Treatments, & Interventions for Alzheimer's Disease & Other Dementias 8 hours
February 2018	Cognitive profile in normal aging of older adults 1 hour
November 2017	APA Integrated Care Model: Collaborative Care Model 8 hours
October 2017	Family Medicine Midwest Annual Conference
September 2017	38th Forum for Behavioral Science in Family Medicine
	Union Hospital Annual Geriatric Conference 6 hours
June 2017	Indiana Rural Health Association Annual Conference
	Neuropsychology Assessment Seminar 8 hours
January 2017	Star Behavioral Health Providers Tier One Training: Military Culture 8 hours
October 2016	Midwest Pain Society 40th Scientific Meeting

June 2016	Alzheimer's Disease: Awareness, Caregiver Support and Patient Care 8 hours
April 2016	IU Mini-Medical School: Dad are you okay? Depression in the Senior population 2 hours
January 2015	Seeking Safety: An Evidence Based Approach for Trauma and/or Addictions 6 hours
January 2015	Cognitive Behavioral Therapy for Insomnia 2 hours

COMMITTEE MEMBERS

Committee Chair: Jennifer Schriver, Ph.D.

Professor of Psychology

Indiana State University

Committee Member: P. Kevin Bolinskey, Ph.D., HSPP

Professor of Psychology

Indiana State University

Committee Member: Veanne Anderson, Ph.D.

Professor of Psychology

Indiana State University

ABSTRACT

With the increased focus on the "Opiate Epidemic" and prescription drug practices, there has been increased conversation in regard to improving the way physicians assess and treat chronic pain. Little empirical research has been devoted to developing formal assessment techniques which address the unique challenge of assessing pain in a primary care setting. The current study explores the effectiveness of commonly used physical and mental health self-report measures in detecting malingered chronic pain and drug-seeking in a health care setting. Moreover, the study compared individuals with and without formal chronic pain diagnoses or a history of chronic pain treatment. Ninety-seven chronic pain patients and ninety-one college students participated in this study and were assigned to an honest responders or a simulation group. Those that were assigned to the simulation group reported increased pain severity and disability compared to chronic pain patients honest responders. Additionally, traditional medico-legal measures demonstrated variable success at distinguishing simulators and honest responders. Simulators also endorsed more risk factors for potential opiate-based medication abuse, and more symptoms of depression and anxiety. It was expected that knowledge of chronic pain and familiarity with many of the study's measures would result in a more sophisticated response style when asked to simulate drug-seeking behavior. This was not the case, and on some measures, chronic pain patients in the simulation group displayed more overt patterns of malingering than student responders who were assumed to be less educated about pain. The concept of this study was formulated based on prior research on malingered neuropsychological disorders and medico-legal disability evaluations, and attempted to fill a gap in the research on the assessment of

feigned chronic pain in medical settings. This will help further develop methods which increase the effectiveness of assessing chronic pain symptoms in medical settings. As there is more of a push for improved assessment and treatment of chronic pain conditions, this area of research will continue to be important in the future.

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CHAPTER 1

INTRODUCTION

Approximately 50% of chronic pain cases are seen in a primary care setting, making chronic pain the fifth most common complaint in primary care (Sarzi-Puttini et al., 2012). Chronic pain is also known to be one of the most complex and difficult conditions to manage (Volkow & McLellan, 2016). Chronic pain is often defined as a pain response lasting more than 12 weeks or pain lasting longer than expected for the specific injury or illness (Gonzales, Martelli, & Baker, 2000; King, 2000). Approximately 15–25% of American adults have chronic pain conditions, including more than 50% of American adults over the age of 65 years (Sarzi-Puttini et al., 2012).

Opiate-based pain medications are often viewed as the treatment of choice for chronic pain (Butler, Budman, Fanciullo, & Jamison, 2010) and are currently the most commonly prescribed group of medications in the United States (Sarzi-Puttini et al., 2012), with approximately half of the opiate-based pain medications prescribed by primary care providers (Dowell, Haegerich, & Chou, 2016). The majority of opiate-based medication prescriptions written in 2014 were for short-term treatment—less than 3 weeks—however, approximately 9.6 to 11.5 million Americans are being treated with opiate-based medications longer-term (Volkow & McLellan, 2016). Opiate-based medications have been repeatedly demonstrated to be

beneficial in treating acute pain, however, the long-term effectiveness of opiate-based medication therapies has been less certain (Volkow & McLellan, 2016).

Regardless of the research about the effectiveness or ineffectiveness of opiate-based medications, the current literature supports two key issues in the area of chronic pain treatment and management. First, many opiate-based medications are illegally distributed or improperly consumed. Second, the rates of opiate-related addiction and overdose deaths are on the rise (Volkow & McLellan, 2016). The term "Opioid Epidemic" has been splashed across the media, and because many of the illegally distributed opioids are from physicians' prescriptions, physicians are being called upon to review prescription practices of opiate-based medications in relation to chronic pain patients (Volkow & McLellan, 2016). Jamison, Sheehan, Matthews, Scanlan, and Ross (2014) found that many primary care physicians (PCPs) report that managing chronic pain is stressful, with approximately 46% of physicians in the study suggesting they lacked training in prescribing opiate medications. PCPs reportedly lack knowledge about pain management or addiction medicine, and are accused of lacking the confidence for detecting abuse and early stages of addiction, identifying drug-seeking behavior, or discussing these abuse issues with their patients (Anderson, Wang, & Zlateva, 2013; Bhamb et al., 2006; Dougherty, 2012; Manjiani, Paul, Kunnumpurath, Kaye, & Vadivelu, 2014; Volkow & McLellan, 2016). Overall, it appears that physicians are struggling to fight an epidemic that is commonly viewed as 'their fault.'

One difficulty physicians have in identifying drug-seeking behavior is in differentiating genuine symptoms of pain versus feigned chronic pain (Dougherty, 2012). The literature suggests that many individuals who feign or exaggerate chronic pain symptoms do so in order to obtain opiate-based medications. Approximately seven to ten percent of opiate-based medication

diverted illegally occurs when an individual feigns pain symptoms and acquires an opiate-based medication prescription to give to a friend or family member. Some individuals will even go to several doctors to obtain multiple prescriptions for opiate-based pain medication—also known as 'doctor shopping' (Volkow & McLellan, 2016). Volkow and McLellan (2016) outlined several strategies to reduce the risk of opiate-based medications being diverted or misused with utilization of screening tools to assess for risk of substance abuse and identify patients with substance use disorders as a primary recommendation. Many doctors rely on screening tools for assessing substance abuse risk, but the research literature does not provide evidence of these practices being effective (Reuben et al., 2015). Prescription Drug Monitoring Programs (PDMPs) have been reported to be effective in identifying individuals who are most likely 'doctor shopping' and abusing or diverting prescription medications; however, logistically PDMPs are ineffective because states are not required to have such monitoring programs, and many states do not require physicians to report consistently (Volkow & McLellan, 2016). It appears that although there are logical recommendations available to help physicians manage the risk of misuse or diversion of opiate-based pain medications in primary care, the recommendations continue to fall short and remain ineffective in identifying malingered chronic pain and drug-seeking behaviors.

The field of psychology is often involved in the assessment, treatment, and management of chronic pain; however, the field has not focused on identifying drug-seeking behaviors in order to identify methods for reducing misuse of opiate-based medications. Psychological researchers in the field of forensic psychology have been studying ways to assess genuineness of impairments related to pain symptoms for more than a decade in order to enhance psychologists' ability to assess disability and worker's compensation claims (Bianchini, Etherton, Greve,

Heinly, & Meyers, 2008; Bianchini, Greve, & Glynn, 2005; Greve, Bianchini, & Brewer, 2013; Greve, Etherton, Ord, Bianchini, & Curtis, 2009). This research has focused on distinguishing feigned from genuine impairment, and has worked to develop specific criteria for identifying malingered pain-related disabilities (MPRD) (Bianchini et al., 2005). In this quest for knowledge, researchers have utilized traditional neuropsychological malingering measures (Bianchini et al., 2005; Etherton, Bianchini, Greve, & Ciota, 2005; Greve et al., 2013; Greve et al., 2009), personality assessment measures (Marek, Block, & Ben-Porath, 2015; McCord & Drerup, 2011; Tarescavage, Scheman, & Ben-Porath, 2015), and a plethora of self-report measures (Hawker, Mian, Kendzerska, & French, 2011; Kim, Yi, & Cynn, 2015). Some of the psychological instruments have demonstrated effectiveness in distinguishing feigned versus genuine impairment and symptom presentations, however, these measures are generally focused on determining the authenticity of disability claims and offer limited assistance to physicians charged with the task of determining authenticity of pain symptoms. Many of the measures are too time consuming to administer or too complex to interpret within the fast-paced culture of primary care. Therefore, these measures are often ineffective solutions for helping physicians identify patients who may be feigning or drug-seeking and at risk for misusing or diverting opiate-based medications. Also, for some measures deemed effective in the medico-legal context there is no research on their effectiveness in primary care. Similarly, the multiple measures which are currently used in primary care settings to assess pain symptom severity and impairment have not been researched to establish their effectiveness in distinguishing malingered chronic pain from genuine pain.

Overall, identifying potential methods of differentiating genuine chronic pain symptoms from possible feigned symptoms in primary care settings is an understudied area in the current

literature. The purpose of the current study was to investigate the effectiveness of several pain self-report measures commonly utilized by PCPs for distinguishing genuine pain from simulated pain in a primary care setting. Additionally, two brief measures utilized by forensic psychologists to assess exaggerated pain reports were included to see if their established effectiveness in the medico-legal arena translates into the primary care setting. Lastly, individuals with chronic pain and individuals without chronic pain were compared to examine group differences in malingered response patterns.

CHAPTER 2

LITERATURE REVIEW

Prescription Opiates Epidemic

Developing methods of identifying drug-seeking behaviors in chronic pain patients has been identified as an important step in aiding medical providers combating the opiate epidemic (Volkow & McLellan, 2016). The National Alliance for Model State Drug Laws (NAMSDL, 2016) reported that approximately 20% of American adults were using opioids for non-medical or off-label use. A study by the American Society of Addiction Medicine (ASAM, 2016) suggested that 94% of individuals using heroin did so because they could no longer obtain prescription pain medications, and approximately four out of five individuals using heroin had abused prescription pain medication prior to heroin use. Further, the ASAM suggested that in 2014, 1.9 million Americans were reported to have an addiction to prescription opiate-based pain medication, and 586,000 Americans were addicted to heroin. An estimated 18,893 Americans overdosed on prescription opiates, and another 10,574 Americans overdosed on heroin in 2014. From 1999 to 2010, overdose deaths related to prescription pain medication had increased approximately 400% in women and 207% in men, and heroin overdoses have more than tripled from 2010 to 2013. Physicians—particularly primary care providers (PCPs)—are often viewed as the cause of this epidemic due to ineffective use of opiate-based medication and poorly regulated prescription practices (Volkow & McLellan, 2016).

Opiate-based medications are the most common prescription written in the United States (Volkow & McLellan, 2016). The United States consumes approximately 80% of the world's opioid-based medications, and in 2015, American physicians wrote approximately 300 million prescriptions for opioid-based medication (Gusovsky, 2016). In reaction to the opiate epidemic, the federal government has encouraged the development of new prescription drug laws and prescription monitoring systems. The National Conference of State Legislators (NCSL, 2016) reported that approximately 194 bills related to prescription drug abuse and drug monitoring programs were introduced at the state level in 2015, with approximately 61 bills becoming enacted by 2016. In 2016 Indiana enacted IN S 214, a bill regarding prohibiting Medicaid reimbursement for opioid addiction treatments (e.g., Suboxone or Subutex), and IN H 1278, which discusses the Indiana Board of Pharmacy Prescription Monitoring (INSPECT) Program allowing reciprocity across medical professionals (e.g., dentists, physicians, nurse practitioners, and podiatrists) for tracking scheduled prescriptions/controlled substances via a shared electronic database. Although Indiana has been increasing their laws on regulating prescriptions, there are currently no federally mandated reporting practices, no mandated reporting between states, nor any standardization amongst the states on physicians' reporting consistency (Volkow & McLellan, 2016).

As of January 2016, there have been many changes to pain management and prescription policies recommended by state organizations, but only twenty-three states have adopted formal education requirements for physicians regarding issues such as pain management, identifying substance abuse disorders, and prescribing scheduled prescriptions/controlled substances (NAMSDL, 2016). Indiana is currently among the twenty-seven states which do not have formal education requirements for physicians regarding prescription drug issues. However, Indiana is

one of many states that require that physicians have documented treatment plans and informed consents for treating chronic pain conditions. Additionally, Indiana is among many states that also recommend that medical service providers perform both a physical assessment and a substance use disorder assessment prior to writing prescriptions for scheduled prescription/controlled substances (NAMSDL, 2016). However, these recommendations offer no suggestion on how PCPs should assess for pain symptoms or substance use disorders. As an added level of protection, many states have recommendations for when a physician should refer a patient to a specialist for pain management (NAMSDL, 2016). Indiana policy suggests that when a patient's daily opiate use equals approximately 60 morphine milligram equivalents (MME), the physician should review the case and consider referral to a pain management specialist. Such recommendations are unique since it has not been unusual practice for PCPs to manage some chronic pain patients on more than 100 MME (Volkow & McLellan, 2016). Overall, federal and state legislative bodies are attempting to decrease the risk of individuals becoming addicted to opiates and decrease the availability of prescription opiates for recreational use. However, these initiatives bring to light the difficult task physicians face for differentiating between genuine pain symptoms and malingered chronic pain in primary care settings.

Malingering

According to the Diagnostic and Statistical Manual of Mental Disorders– Fifth Edition (DSM-5; APA, 2013, p. 726), malingering is defined as the "intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives." In light of the opiate epidemic, external incentives from malingering chronic pain may include obtaining opiate-based medication. The DSM-5 cautions that clinicians should suspect malingering in medico-legal contexts, when there are discrepancies between reported

symptoms/distress and objective clinical findings, when the individual is not cooperative with evaluations or treatment, and when the individual has a diagnosis of antisocial personality disorder (APA, 2013). The DSM-5 criteria for malingering were not significantly changed from the DSM-IV-TR (APA, 2000) criteria which were heavily criticized by researchers for being overly moralistic and lacking in empirical support (Aronoff et al., 2007; Berry & Nelson, 2010; Rogers, 2010). Rogers (2010) noted that approximately two-thirds of true malingerers in legal settings are correctly identified when applying two or more of the DSM –IV TR criteria for malingering. However, for each person correctly identified as malingering, Rogers (2010) reported that four individuals with genuine symptoms would be incorrectly identified as malingering. He has suggested that the determination of malingering is largely based on the assumptions of an examiner and is often influenced by a clinician's assumptions about the individual (e.g., innocent until proven otherwise versus assumed to be malingering until proven otherwise). Rogers suggests that better defining the current criteria may help encourage more systematic approaches to the assessment of malingering and reduce misidentifying genuine pain patients as malingering (Rogers, 2013). Other researchers have noted the ineffectiveness of the criteria for malingering, and these results demonstrate the difficulty in the research for developing assessment methods which have a high rate for identifying malingerers, but also have a low false positive rate for honest responders (Fugett, Thomas, & Lindberg, 2014).

In attempts to revamp the current criteria for malingering, many researchers have been attempting to better define the concept of malingering (Etherton, 2014; Grover, Close, Wiele, Villarreal, & Goldman, 2012; Vukmir, 2004) in addition to developing symptom-specific criteria for identifying malingering in specific populations (e.g., Malingered Pain-Related Disability;

Bianchini et al., 2005). However, there is currently no gold standard on how to define or assess for malingered chronic pain.

The current literature highlights three main types of malingering classification: pure, partial, and false imputation (Fishbain, Cutler, Rosomoff, & Rosomoff, 1999; Iverson, 2006; McDermott & Feldman, 2007). Pure malingering occurs when the reported symptoms or impairment do not currently exist and have never existed. Partial malingering occurs when individuals intentionally exaggerate or over-report the severity of genuine symptoms. False imputation occurs when an individual purposefully attributes actual symptoms to an unrelated event in order to gain compensation. For malingered chronic pain in medical settings, it is assumed that individuals will tend to initially engage in partial malingering behaviors of exaggerating or magnifying pain symptoms rather than engaging in pure malingering of pain (McDermott & Feldman, 2007). This assumption is based on the tendency of many individuals with addiction to opiates to report that the addiction started following treatment for genuine pain. Rogers (2010) also noted that malingering is more likely to occur when evaluations are viewed as adversarial, when personal stakes for the individual are high, and when no other alternative explanations for symptom discrepancies appear viable. The overall study of malingered chronic pain has been heavily focused on pain-related disability (PRD) and malingered pain-related disability (MPRD) in the medico-legal context of disability claims, personal injury lawsuits, and workers compensation cases (Etherton, 2014; Martin & Schroeder, 2015; Stone & Merlo, 2012; Wiggins, Wygant, Hoelzle, & Gervais, 2012). Attempts at developing specific criteria for identifying MPRD have been proposed (Bianchini et al., 2005) and used in current research (Bianchini et al., 2008; Etherton, 2014; Greve et al., 2013). However, the proposed MPRD criteria focus on determining whether the resulting disability caused by the pain condition or

injury is genuine, and the criteria do not clarify the concept of malingered chronic pain symptoms or assist in developing methods for determining whether an individual's reported pain symptoms, themselves, are genuine.

Recommendations and current research with regard to differentiating between genuine and malingered pain symptoms has been heavily influenced by the literature about malingered neurological conditions (e.g., traumatic brain injury, attention-deficit/hyperactivity disorder) (Bianchini et al., 2005). The fields of psychology and medicine often assume that patients will be forthcoming and truthful about their physical, mental, and cognitive functioning (Rogers, 2012). However, Rogers (2010) identifies six distinct response styles individuals may engage in: 1) malingering, 2) defensiveness (the minimization of symptoms/faking good), 3) irrelevant responding (responses not related to clinical inquiry), 4) random responding, 5) honest responding, and 6) hybrid responding. The challenge in evaluating malingering is differentiating malingering from other response styles. Additionally, when an individual engages in suspect responding, Rogers (2012) has proposed gradations of malingering which encompass pure and partial malingering: 1) mild malingering, 2) moderate malingering, and 3) severe malingering. Mild malingering occurs when a patient exaggerates his/her symptoms, but the severity of the malingering is minimal. Exaggeration of symptoms rises to the moderate level when the individual begins to increase the severity of reported symptoms and impairment, and presents themselves as markedly impaired. Rogers (2010) identifies cases wherein symptom presentations appear to be extreme or completely fabricated as severe malingering. There is, however, a significant lack of empirical evidence to support these distinctions across physical and mental conditions.

The primary focus in malingering research has been on neurological conditions. Recommendations about the assessment of malingering in the neuropsychological literature center on looking for inconsistencies in a patient's performance across multiple measures, which has resulted in the field developing multiple symptom validity measures and techniques (Booksh, 2005; Jasinski et al., 2011). Rogers (2013) has emphasized the Test of Malingered Memory (TOMM; Tombaugh, 1996) as a specific measure for assessment of effort which may provide evidence for or against malingering. Tests such as the TOMM are simple tasks which are presented and described in such a way that the task appears deceptively difficult. Therefore, individuals attempting to malinger may perform more poorly on the measure. Assessment measures such as the Structured Inventory of Malingered Symptomatology (SIMS) have been used to assess over-endorsement of symptoms (Jasinski et al., 2011). Psychologists believe that individuals who are malingering will over-endorse symptoms, even those unrelated to their presenting issue (Booksh, 2005; Harp, Jasinski, Shandera-Ochsner, Mason, & Berry, 2011; Harrison, Edwards, & Parker, 2007). For example, in the medico-legal literature, individuals reporting chronic pain symptoms may also endorse more significant cognitive or psychological symptoms than expected from cognitively impaired or mentally ill individuals (Etherton, 2014). Unfortunately, the current literature suggests that neither psychologists nor physicians have had significant success in developing methods to assess malingered chronic pain, therefore, PCPs appear to be at a disadvantage in screening patients for feigned pain symptoms (Crighton, Wygant, Applegate, Umlauf, & Granacher, 2014).

The limitations in the malingered chronic pain literature have not gone unnoticed. Thoma (2010) stated that the assessment strategies for detecting malingered pain used in research is often inapplicable to clinical practice. For example, she and others have argued that the current

medical setting literature is lacking in case examples which demonstrate "gold standards" for identifying potential malingerers (Phelan, van Ryn, Wall, & Burgess, 2009; Shields et al., 2013). Distinguishing genuine pain symptom reporting from malingering is a necessary but often a challenging task for physicians in busy emergency room departments (Dougherty, 2012; Grover et al., 2012; Weiner et al., 2013) or primary care settings (Etherton, 2014; Klinar et al., 2013). The literature has also debated whether physicians are qualified to assess for or identify malingering of symptoms in chronic pain patient populations (Kumar, 2013) due to disparities in medical training on pain management and addictions medicine (Seroussi, 2015; Upshur, Luckmann, & Savageau, 2006; Volkow & McLellan, 2016; Vukmir, 2004). Arguments in the literature propose that it may be unrealistic to assume that physicians can differentiate between genuine pain symptoms and malingering; however, developing systems for physicians to identify "inconsistency profiles" or identify patients who may require more thorough assessment of pain symptom authenticity may be a valuable pursuit (Crighton et al., 2014).There may be significant value in researchers developing assessment methods for identifying patients at 'high risk' for malingering and educating physicians on how to utilize such assessment resources in their clinical practice.

Malingered Chronic Pain in a Medical Setting

Approximately 50% of chronic pain cases are managed and treated within a primary care setting, which makes chronic pain the fifth most common complaint in primary care (Rinkus & Knaub, 2008; Sarzi-Puttini et al., 2012). The increase of opiate-based medication and heroin abuse has stimulated discussion about how physicians can successfully manage and treat chronic pain and reduce the patient's risk of addiction (Butler et al., 2010; Edwards et al., 2011; Jamison et al., 2014; Meltzer et al., 2011). The development of assessment strategies focused on the

assessment of pain symptoms versus risk of addiction appears to be hindered by disagreements amongst medical providers regarding whether malingering is a valid concern in primary care (Kumar, 2013), even in cases of delayed recovery from pain symptoms (Aronoff et al., 2007). Patients with physically unexplained pain symptoms often get viewed as having non-organic pain or psychogenic pain—or pain without an anatomical basis, and malingering is rarely considered in the medical literature outside of disability or worker's compensation evaluations (Kumar, 2013). Physicians are focused on providing effective care for their patients, and they often assume that patient self-report is honest and true (Aronoff et al., 2007), and are not focused on verifying facts about patients' symptom complaints.

Recent literature has recognized the risk of addiction when using opiate-based medications to manage chronic pain, but has tended to focus on behavioral signs of drug-seeking in medical settings through observations or screeners (Butler et al., 2010; Dougherty, 2012; Edwards et al., 2011; Jamison, Serraillier, & Michna, 2011; Meltzer et al., 2011). It is often assumed that a significant amount of malingered chronic pain is in pursuit of opiate-based pain medication; however, the empirical literature has not focused on malingering with the intent for obtaining medication. The malingering research has previously only compared true chronic pain patients to simulators (e.g., college students) (Crighton et al., 2014), or compared chronic pain patients with and without financial incentives or involvement in legal cases (Bianchini et al., 2014). By and large, the literature has neglected how PCPs can evaluate the authenticity of pain symptoms in chronic pain patients.

Overall, the focus has been on managing the risk of addiction rather than on distinguishing genuine from malingered chronic pain symptoms. Keller et al. (2012) surveyed 81 physicians, and found that 82.9% of physicians believed that individuals addicted to opiates

started using opiates due to genuine pain symptoms. Additionally, approximately 71.5% of physicians are uncomfortable with managing potential opiate addiction/dependence. This suggests that physicians are not ignorant about the opioids epidemic, but may be struggling to help solve the crisis due to insufficient knowledge about pain management and a lack of assessment tools for pain. Multiple measures have been recommended for assessing opiate-based medication abuse risk and medication compliance (Butler et al., 2010; Edwards et al., 2011; Jamison et al., 2014; Meltzer et al., 2011); however, the medical literature continues to demonstrate an imbalance between researching malingered chronic pain and researching management techniques to reduce risk of addiction. According to the research literature, the current assessment tools for physicians are proving ineffective (Anderson et al., 2013; Anderson, 2008; Bhamb et al., 2006).

One reason that medical research has not focused significantly on the problem of pain malingering is the previously mentioned belief that many physicians are not convinced that patients attempt to malinger chronic pain. Estimated or actual frequency rates for malingered chronic pain in medical settings are lacking in the current literature (Thoma, 2010); however, frequency estimates for the rate of malingering in a medico-legal context are widely available (e.g., Aronoff et al., 2007; McDermott & Feldman, 2007). The Institute on Medicine's Committee on Pain suggested that malingering is rare in patient populations (Sarzi-Puttini et al., 2012); however, the literature estimates that approximately 36–44% of individuals involved in legal cases (e.g., worker's compensation, disability), and up to 36% of individuals not involved in legal cases are malingering pain symptoms (Aronoff et al., 2007; McDermott & Feldman, 2007). Additionally, the literature has documented that patients without pain-related symptoms have admitted to malingering somatic symptoms during an appointment with their physician

(Fishbain et al., 1999). Regarding physicians' overall level of concern about malingering, Williams and Schriver (2016) surveyed 55 family medicine physicians and residents and found that physicians were concerned about malingering approximately 36% of the time when treating chronic pain patients. Additionally, participants' confidence levels in differentiating between genuine and malingered symptoms, and in managing and treating chronic pain patients were not significantly impacted by education or continuing medical education related to drug-seeking or chronic pain. Surprisingly, physicians and residents who had previous education about drug-seeking behaviors estimated that malingering was less common. It appears that attitudes about the frequency of pain malingering as well as knowledge about how to assess for malingering are current obstacles in primary care for identifying drug seeking behavior.

Drug-Seeking Behaviors

The term "drug-seeking behaviors" is generally used as a descriptive term in conversations between medical providers and, unlike malingering, does not include clear criteria (McCaffery, Grimm, Pasero, Ferrell, & Uman, 2005). There is significant stigmatization in the medical setting about patients labeled as drug-seeking. Overall, drug-seeking can be considered any behavior that assists the patient in obtaining medications due to an active substance-abuse problem or for obtaining medication to sell illegally or divert to friends and family (McCaffery et al., 2005). For the purpose of the current study, the terms malingering and drug-seeking behavior will be used interchangeably.

Drug-seeking behaviors often include asking for a specific medication or dosage, use of patient aliases, multiple reports of loss/misplaced medication, current high prescription dosage of opiate-based medications, preoccupation with opiates, and reports that non-opiate medications are ineffective or the patient is allergic to them (Dougherty, 2012; Rinkus & Knaub, 2008).

Grover et al. (2012) reviewed charts of patients determined to be either drug-seeking or honest responders in order to quantify which behaviors were most commonly seen in the emergency room. Individuals were categorized as drug-seeking patients when they were enrolled with case management due to a substance abuse disorder or had been put on a care plan that limited access to narcotics, benzodiazepines, or muscle relaxants. The researchers found that individuals demonstrating drug-seeking behaviors tended to rate their pain as 10 or higher on a 10-point scale for pain more often than patients who did not have drug-seeking/addiction problems on their problems lists. Additionally, patients engaging in drug-seeking behavior tended to request parenteral—or intravenous— medications whereas none of the honest responder subjects did. This suggests that such behavior may be more highly predictive of drug-seeking. However, these findings contradicted the belief that reporting non-narcotic allergies was a factor for drug-seeking as it was found that this behavior was not strongly predictive of drug-seeking behavior. Such red flags are not always overtly presented to a physician, nor are they always easy to identify for physicians. Emergency room physicians are particularly at risk for missing these red flags because they have a small amount of time to treat a patient's symptoms and often do not have extensive knowledge of a patient's medical history (Dougherty, 2012).

Katz and Rondinelli (1998) suggested that four or more active opioid-based medication prescriptions from four or more pharmacies should be considered a red flag for potential questionable prescription activity and drug-seeking behavior. However, Weiner et al. (2013) criticized this recommendation and the utility of prescription databases in assessing for risk of drug abuse in chronic pain patients because of the delay in prescription reporting (e.g., lag times up to three weeks) and the complications of having residents prescribe medication under the supervision of another provider. They recommended that future research focus on developing a

standardized scoring system which predicts malingering or drug-seeking behaviors based on multiple clinical factors in addition to prescription-tracking database results. Additional screening tools may be beneficial to assist physicians when assessing the authenticity of pain.

Although noting drug-seeking behaviors has been recommended to identify suspicious patient behavior, there are still no standardized assessment measures for physicians to make sure they have identified these behaviors or to quantify a level of risk for malingering chronic pain in medical settings. The difficulty in assessing and managing chronic pain has resulted in a phenomenon of both undertreated and over-treated pain (Sarzi-Puttini et al., 2012). The literature suggests that individuals with undertreated pain tend to be at higher risk for developing patterns of drug-seeking behavior that has been classified as a "pseudo-addiction," or heavily seeking out medication for genuine symptoms, which tends to subside when pain symptoms are adequately treated (Sarzi-Puttini et al., 2012). It appears that physicians may greatly benefit from the development of effective screening measures to help identify patients at risk for exaggerating or malingering chronic pain symptoms.

Medical Assessment of Malingered Chronic Pain

Medical providers have very few tools with which to assess the authenticity of symptoms outside of the previously mentioned red flag behaviors. In a 2016 study by Williams and Schriver, physicians were unable to identify any specific methods for assessing for drug-seeking behaviors even when specifically asked to do so by the researchers. This is consistent with the present literature that stating many physicians only attempt to determine organic versus inorganic causes of pain symptoms (Rinkus & Knaub, 2008). Instead of labeling a patient as drug-seeking or malingering, a physician may state that the pain is inorganic and, therefore, may benefit from non-pharmaceutical interventions (e.g., psychological treatment such as cognitive behavioral

therapy; (Seroussi, 2015). Physicians heavily utilize instinct and range of motion/physical manipulation tasks to help assess a patient's pain symptoms. In utilizing such interventions, the physician is looking for inconsistencies between presentation and observed functioning (Rinkus & Knaub, 2008; Seroussi, 2015).

Overall, it appears there are two popular physical examination methods that appear to provide some level of objective assessment of pain symptoms: 1) the Waddell signs, and 2) the Flexion, Abduction, and External Rotation (FABER) test. The Waddell signs have often been recommended to help identify individuals who require more thorough assessment of symptom authenticity or who may benefit from psychological interventions (Rinkus & Knaub, 2008; Rohrlich, Sadhu, Sebastian, & Ahn, 2014). The Waddell signs are based on five non-organic signs: tenderness (e.g., superficial, nonanatomical), stimulation (e.g., axial loading, rotation), distraction (e.g., straight leg raising), regional disturbances (e.g., weakness, sensory), and overreaction to pain (Waddell, McCulloch, Kummel, & Venner, 1980). Using this technique, a physician examines the patient and determines if they are "positive" in each area. When a patient is positive in three or more areas, it is considered clinically significant. Research has found that individuals who score positive on three or more of the Waddell signs have higher rates of depression, hypochondriasis, and hysteria as measured on the MMPI-2 (Maruta et al., 1997). Overall, there is mixed support for the effectiveness of the Waddell signs (Fishbain et al., 2003; Fishbain, Cutler, Rosomoff, & Rosomoff, 2004; Siqueira & Morete, 2014), but some continue to recommend their use for assessing chronic pain under the caveat that the signs should be considered within the context of the patient and not viewed as an independent physiological malingering screener (Apeldoorn et al., 2012).

The FABER test (flexion, abduction, and external rotation of the hip) has also demonstrated some effectiveness in identifying inconsistencies in patient reports and observed functioning, and ruling-out etiology of specific pain conditions such as lower back pain (Rinkus & Knaub, 2008). The difficulty with utilizing such assessment strategies is their subjectivity. Overall, tests such as the Waddell signs or the FABER test have not demonstrated reliability in distinguishing organic from non-organic pain, and have repeatedly been observed to underestimate the amount of pain an individual is experiencing (Fishbain et al., 2003). Additionally, there tends to be significant variation amongst examiners' interpretation of findings using the same techniques with the same patient (Fishbain et al., 2004). Thus, a more standardized approach that is not as vulnerable to the subjective opinion of the physician would be helpful in assessing authenticity of pain symptoms.

Pain management specialists have developed multiple screening tools to assist with identifying individuals who may be at risk for, or are currently misusing, prescription medications (Grover et al., 2012). These assessment measures include the Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R; Butler, Fernandez, Benoit, Budman, & Jamison, 2008), Opioid Risk Tool (ORT; Webster & Webster, 2005), Current Opioid Misuse Measure (COMM; Butler et al., 2007), Diagnosis, Intractability, Risk, and Efficacy Score (DIRE; Belgrade, Schamber, & Lindgren, 2006), and the Addiction Behavior Checklist (ABC; Wu et al., 2006). Measures such as the SOAPP-R, have recommended cut-off scores to alert physicians to an increased risk of substance abuse (Edwards et al., 2011; Passik & Kirsh, 2008), whereas other measures, such as the ORT or COMM, have some demonstrated utility in identifying the risk of addiction prior to prescribing opiates and in screening for symptoms of addiction in pain management settings (Butler et al., 2010; Passik & Kirsh, 2008). The DIRE has

been reported to be helpful in identifying chronic pain patients who may benefit from long-term opiate-based treatments (Bohn, Levy, Celin, Starr, & Passik, 2011; Jamison et al., 2011). However, many of the above measures have been accused of being difficult to accurately interpret, lacking accuracy in identifying those at risk of substance abuse, and for being developed using insufficient methodology with poor standardization (Chou et al., 2009). Overall, many of these measures have not been thoroughly tested in primary care settings (Butler et al., 2010; Butler, Budman, Fernandez, Fanciullo, & Jamison, 2009). Although they have demonstrated some effectiveness in identifying opiate abuse or identifying which patients may be appropriate for opiate-based treatments, they are still lacking utility in assisting physicians to assess the authenticity of pain symptoms.

There is a paucity of research on the use of pain-specific measures to evaluate malingering. McGuire and Shores (2001) compared responses of 40 patients with chronic pain to 20 student simulators on the Pain Patient Profile (P3) to see if the measure could discriminate the two groups. Although validity scale scores were not significantly different between the two groups, simulators scored significantly higher than the patient population on the clinical scales for Depression, Anxiety, and Somatization. The Depression scale, for example, correctly discriminated between simulators and genuine patients 80% of the time. In a second study, McGuire and Shores (2004) found that chronic pain patients reported less severe symptoms when the P3 was administered under normal instructions as compared to when patients were asked to exaggerate their pain. In the exaggeration trial, the researchers found that the validity scales on the P3 were effective in differentiating between trials (e.g., normal responding versus exaggerated responding). This study found evidence that simulators tend to endorse symptoms from multiple areas of functioning (e.g., depression, anxiety, and somatization) in addition to

over-endorsing level of functional impairment compared to honest responders. A limitation to measures like the P3 is the multi-step scoring method, which is often impractical for many primary care settings. Additionally, the P3 has been primarily recommended for use in forensic evaluations (McGuire & Shores, 2004) as opposed to busy primary care settings.

Psychological Assessment of Chronic Pain and Malingered Chronic Pain

Most of the research on malingered chronic pain has been done by psychologists using objective personality measures (McCord & Drerup, 2011; Witkin, Farrar, & Ashburn, 2013), neuropsychological measures (Iverson, Page, Koehler, Shojania, & Badii, 2007), and other psychological measures, such as quantitative sensory testing (Kucyi, Scheinman, & Defrin, 2015). The overall assumption in the malingering research is that individuals malingering pain symptoms will respond to items in such a way that the test scores will be able to reliably identify suspicious responding (Fugett et al., 2014).

To identify what methods are used by psychologists to evaluate for malingering in personal injury evaluations, Boccaccini, Boothby, and Overduin (2006) sent out a case vignette of an individual involved in litigation to clinical psychology forensic and pain specialists. The researchers found that over half of the psychologists specializing in forensic work, pain, or both recommended using the MMPI-2 to assess for malingering. The study also found that approximately one-third of forensic psychologists administered the Validity Indicator Profile (VIP) (Frederick, 2003). Approximately 23% of clinical psychologists specializing in both pain and forensic work recommended using the Structured Interview of Reported Symptoms (SIRS) (Rogers, Sewell, & Gillard, 2010), and fewer than 13% of psychologists in any of the groups recommended using the TOMM. These results suggest that psychologists recommend using multipurpose measures (i.e., contain validity scales to assess response style, and may provide

information on personality or symptomology) versus measures which are specific to effort testing or specific to pain. However, these psychological measures are often impractical for use in primary care settings due to their length.

Objective Measures

The Minnesota Multiphasic Personality Inventory (MMPI). The original purpose of the MMPI (Hathaway & McKinley, 1951) with pain patients was to discriminate between functional and organic sources of pain (Adams, Heilbronn, & Blumer, 1986; Vendrig, 2000). Even though the original MMPI was unable to distinguish etiology of pain symptoms, research into what the MMPI can tell clinicians and medical professionals has pushed on for decades, resulting in the MMPI/MMPI-2 becoming one of the most commonly used measures for assessing chronic pain, especially in forensic settings (Boccaccini et al., 2006; LaPilusa, 2010). Overall, the MMPI-2 *F* scale has proven to be insensitive to exaggeration of chronic pain symptoms, partly due to its focus on mental illness (Rubenzer, 2006). In the Palmer, Borras, Perez-Pareja, Sese, and Vilarino (2013) study, the *F* scale along with the *L* and *K* scales, mistakenly categorized chronic pain as malingering.

The Fake Bad Scale (FBS) scale has been stated to detect potential malingering or peculiar behavior (Greve & Bianchini, 2004; Rubenzer, 2006); however, others suggest the FBS scale only identifies individuals involved in litigation (Arbisi & Butcher, 2004). Lee, Graham, Sellbom, and Gervais (2012) found that individuals with genuine medical conditions (e.g., organic lower back pain) also elevated the scale to levels said to suggest malingering. Overall, the FBS scale has been examined in a number of research studies, but has demonstrated mixed findings that have deterred some clinicians from suggesting its use in forensic settings, especially for assessment of pain (Rubenzer, 2006). More recently, Nichols and Gass (2015) reported that

there are significant parallels between the FBS and Litigation Response Syndrome proposed by Lees-Haley (1988), and this adds to the hesitation many forensic evaluators have in regard to the validity of the FBS.

Many researchers have been looking for ways to enhance the MMPI's utility in the assessment of chronic pain. One attempt was by Meyers, Millis, and Volkert (2002), with the introduction of the Meyers Validity Index for the MMPI-2, which combined seven MMPI-2 scales and indices (F-K, F, Fp, Ds-r, ES, S-O, and FBS) to create a weighted score that could differentiate between true chronic pain and malingering. The value for each scale is based on whether it falls in a particular score range. For example, if the Fp T-score ranges from 75–89 the scale is given a value of 1, but it will receive 2 points if the scale is above a T-score of 90 (Meyers et al., 2014). According to Meyers et al. (2002), this method was able to counteract the effects of psychological distress (e.g., anxiety, depression) and had 100% specificity and 86% sensitivity in identifying malingered chronic pain when using a cut off score of > 5. Aguerrevere, Greve, Bianchini, and Meyers (2008) reviewed over 500 evaluations for neuropsychological and pain disability, and separated cases into financial incentive versus no financial incentive. Participants identified as drug seeking were placed in the non-financial incentive group. The participants were further classified into groups who met criteria for malingered neurocognitive dysfunction and malingered pain-related disability. The researchers found that an abbreviated version of the index using five scales and indices (F, Fp, ES, F-K, and FBS) was successful in differentiating between valid and malingered chronic pain reports using cut off scores of > 4 and > 3. Few studies, however, have utilized this index since its introduction. Additionally, the validity scales, and the MMPI-2 in general, have been reported to be vulnerable to coaching

effects (Rubenzer, 2006). Indices like the Meyers Validity Index may be extremely vulnerable to coached malingering due to the reliance on validity scale elevations.

The general theme throughout the literature on chronic pain and the revised MMPI-2-RF is that RC1 appears to be consistently elevated in chronic pain populations and is associated with increased pain severity and medication use (LaPilusa, 2010; Tarescavage et al., 2015). Much like the MMPI-2, the MMPI-2-RF's F-scale also appears vulnerable to coaching (Aguerrevere et al., 2008). Even when considering the strengths of the MMPI/MMPI-2/MMPI-2-RF, the large amount of test items and complex scoring rules out the MMPI's effectiveness for use by physicians in assessing authenticity of chronic pain symptoms in primary care settings.

Personality Assessment Inventory (PAI). The PAI (Morey, 1991) has been recommended for use in treatment planning and long-term management of chronic pain (Karlin et al., 2005), however, there is limited research on malingered chronic pain using the PAI. Hopwood, Orlando, and Clark (2010) compared PAI responses of 317 chronic pain patients to 152 college student pain simulators and demonstrated that the PAI could distinguish between true patients and chronic pain simulators. However, the authors noted that the PAI did not demonstrate adequate sensitivity for distinguishing malingered chronic pain, and therefore they would not recommend it be used in clinical practice.

Malingering Specific Measures

There have been multiple self-report measures used in psychological research regarding chronic pain assessment including the Life Assessment Questionnaire (LAQ) (Tearnan & Ross, 2012), the Validity Indicator Profile (VIP) (Frederick, 2003), the Structured Interview of Reported Symptoms (SIRS) (Rogers et al., 2010), and medical questionnaires such as the West Haven-Yale Multidimensional Pain Inventory (WHYMPI) (Kerns, Turk, & Rudy, 1985) and

McGill Pain Questionnaire (MPQ) (Melzack, 1987). Instruments like the WHYMPI and MPQ have often been used as outcome measures to track intervention progress (Hawker et al., 2011; Stroud, Thorn, Jensen, & Boothby, 2000). Other measures like the LAQ, VIP, and SIRS have been utilized to assess malingered pain symptoms, but are often too time consuming for the fast-paced primary care setting. The Modified Somatic Perception Questionnaire (MSPQ) (Main, 1983) and the Pain Disability Index (PDI) (Tait, Pollard, Margolis, Duckro, & Krause, 1987) are two brief, easily scored measures which have demonstrated some success in identifying malingered chronic pain symptoms and may be better suited for the primary care environment.

Bianchini et al. (2014) compared genuine chronic pain patients to college students simulating pain and found that the MSPQ and PDI were able to distinguish between malingered pain-related disability and non-malingered pain-related disability. They noted that the measures did not appear to be affected by objective medical symptoms (e.g., previous physical injury, spinal surgery, neurological symptoms). Crighton et al. (2014) found similar results when comparing litigant and non-litigant patients with chronic pain conditions. They reported that the MSPQ demonstrated a stronger ability to differentiate between groups than the PDI, but overall, both measures were recommended to be included in forensic evaluations.

Neuropsychological Measures

Because pain patients tend to report multidimensional impairment, which may include cognitive dysfunction (Greve et al., 2009), neuropsychological measures have also been used to evaluate malingering in this population. Etherton, Bianchini, Heinly, and Greve (2006) reported that patients involved in litigation who were suspected of malingering tended to score lower on intellectual assessments (e.g., Wechsler Adult Intelligence Scale-Revised, WAIS-R; and Wechsler Adult Intelligence Scale-Third Edition, WASI-III). Similar results were found by

Etherton (2014) who reported that chronic pain malingerers performed more poorly (scaled score of ≤70) on the Working Memory Index (WMI) of the WAIS-III as compared to genuine patients. Taken together, these results suggest that poor performance on cognitive assessment measures in the absence of a neurologic condition might suggest poor effort or intentional malingering (Etherton et al., 2006).

The Test of Malingered Memory (TOMM; Tombaugh, 1996) is a common symptom validity measure utilized in the neuropsychological literature (Etherton et al., 2005). According to Etherton et al. (2005), individuals experiencing laboratory-induced moderate to severe pain did not experience any decline of performance on the TOMM. Iverson et al. (2007) found that in non-laboratory induced pain situations, the TOMM appears to be unaffected by a patient's pain severity or level of depression. Greve et al. (2009) utilized cut-off scores for each of the three trials (e.g., Trial 1: <42; Trial 2: <47; Retention: <48) and found that the TOMM effectively identified 60.2% of patients who were malingering pain-related disability.

The Reliable Digit Span (RDS; Wechsler, 2014) task is another assessment measure which has been taken from the neuropsychological literature and applied to the assessment of chronic pain. Results regarding the RDS task have been inconclusive as to the instrument's effectiveness in screening for authenticity of symptoms (Greiffenstein, Gervais, Baker, Artiola, & Smith, 2013). The difficulty with many of these measures is that they have not been researched in primary care or medical settings, and are not easily administered in a fast-paced primary care setting.

Overall, psychologists have performed multiple studies looking at the utility of objective, self-report, and symptom validity measures in assessing malingered chronic pain, however, many of the assessment strategies are impractical for use in primary care. It appears that physicians

could benefit more from assessment measures specifically tailored for use in a primary care setting.

Significance of the Current Study

There is increasing pressure on physicians to successfully distinguish between genuine and malingered pain symptoms (Etherton, 2014), but many physicians feel unprepared to properly assess, treat, and manage chronic pain patients in a primary care setting (Laws, 2016). Individuals who malinger pain symptoms may be attempting to obtain opiate-based medications. There are currently no empirical studies assessing the ability of self-report measures to identify drug-seeking behaviors in primary care settings, and the development of instruments which may assist in identifying patients who are malingering pain or engaging in drug-seeking behaviors would be beneficial.

Much of the current psychological research on pain malingering has focused on forensic contexts related to disability and the measures used in these studies often have long administration times, complicated scoring rules, and require complex interpretation by a psychologist. The current study explored the effectiveness of commonly used physical and mental health self-report measures in detecting malingered chronic pain and drug-seeking in a primary care setting. For the current study, the instruments chosen were brief measures which required minimal administration time, and are instruments which have been developed by medical professionals for the purpose of assessing pain symptoms. A simulation design was utilized such that groups of pain patients and college students without pain were asked to either malinger or respond honestly to all measures. Simulation designs that use actual patients are considered superior to those that only study non-clinical groups (Rogers, 1998). This study adds to the literature on assessing malingered chronic pain in a primary care setting versus medico-

legal settings, and adds to our knowledge of the effectiveness of brief screening measures in assessing for malingered pain.

Hypotheses

1.) Replicating prior findings in medico-legal research, individuals asked to malinger chronic pain were expected to endorse items and obtain scores suggesting significantly higher levels of pain and greater functional impairment across pain-related measures compared to pain patients or student honest responders. It was also expected that chronic pain patient honest responders would endorse significantly higher levels of pain and report greater functional impairment as compared to college student honest responder participants.

2.) The current study attempted to extend prior research on the Pain Disability Index and Modified Somatic Perceptions Questionnaire by using the two measures in a primary care setting. Cut-off scores for likely and probable malingering have been proposed in the forensic literature but have yet to be applied in a primary care setting. It was expected that both simulation groups would exceed the cut-off scores for malingering, however, the college student simulators were expected to endorse more items than the chronic pain patient simulators. This is consistent with previous literature about feigning neurocognitive disorders (e.g., ADHD) where naïve simulators often over-endorsed symptoms compared to clinical populations (Jasinski et al., 2011). The participants in the honest responder conditions were expected to remain below the cut-off scores established to identify possible malingerers.

3.) Substance abuse screening measures have yet to be administered in a study of malingered chronic pain in a primary care setting. However, it was expected that college student

simulators would endorse more items—thus exceeding established cut-off scores—compared to chronic pain patient simulators. No significant difference was expected between the chronic pain patient simulator and honest responder groups. It was assumed that individuals with chronic pain would engage in more sophisticated simulation and drug-seeking approaches due to their familiarity with the screening measures and physicians' evaluation practices and, therefore, endorse fewer items on the substance abuse screeners.

4.) Psychological screening measures for depression and anxiety have yet to be administered in a study of malingered chronic pain in a primary care setting. It was expected that both simulation groups would report higher levels of depression and anxiety than the honest responder groups. It was also anticipated that college student simulators would report significantly higher levels of depression and anxiety relative to chronic pain patient simulators. As demonstrated in the malingering literature, individuals asked to simulate symptoms of a specific impairment (e.g., pain symptoms) not only demonstrate deficits in that area, but will also demonstrate deficits across multiple psychiatric symptoms in excess to those reported by normal honest responders or individuals with the specific impairment (Booksh, 2005; Harp et al., 2011). There was no significant difference expected between the student and chronic pain patient honest responder groups.

CHAPTER 3

METHODOLOGY

Overview and Design

The present study sought to evaluate the ability of brief self-report measures to detect malingered chronic pain in a college population sample and a chronic pain sample. Rogers (2008) recommended including clinical populations in both experimental and honest responder conditions as the gold standard for malingering research. Following this recommendation, the present study utilized a 2 (simulator vs. respond honestly) x 2 (college student vs. chronic pain patient) analogue simulation research design in order to address effectiveness of brief self-reports in detecting drug-seeking behavior in clinical and non-clinical populations.

Power Analysis

The necessary sample size for statistical significance was determined by conducting a power analysis. A medium effect size was assumed, although this is not based on previous studies due to the dearth of research comparing groups on these measures. There has been limited malingering/drug-seeking research conducted with chronic pain patients, and there has been no malingering research conducted using the measures selected for this study in a primary care setting. A power analysis using recommendations from Cohen (1992) with a power of .80 and alpha of .05 was used to minimize Type I and Type II errors. The power analysis suggested

that 45 participants would be needed per group when four groups are being compared on individual measures using an ANOVA.

Participants

The participant pool consisted of two groups: 106 undergraduate students and 103 chronic pain patients. Individuals in the chronic pain sample who did not endorse having a chronic pain condition and individuals in the student sample who endorsed having a chronic pain condition were removed from the final sample. The total number of participants whose data was used for the study was 190, including 52 chronic pain patient honest responders, 47 chronic pain patient simulators, 41 student honest responders, and 50 student simulators. Undergraduate students were recruited from introductory psychology classes at Indiana State University. They were awarded course credit for their participation. Students were excluded from participating if they had a chronic pain condition or if they had received treatment for chronic pain. The college student participants were randomly assigned to one of two groups: chronic pain simulation or honest responders.

Chronic pain patients were recruited from the Union Health Pain Clinic. This facility is located in Terre Haute, IN, and sees over 150 patients per month. Patients asked to participate in the study had a current diagnosis of a chronic pain condition. Chronic pain patients were assigned to one of two groups: chronic pain simulation or honest responders. All participants were given the opportunity to submit their contact information in a drawing for a $20.00 gift card from Amazon.

Demographic characteristics for all participants (N = 190) are displayed in Table 1. Regarding the gender make-up of the sample, 35.3% (n = 67) of the participants were male, and 64.7% (n = 123) were female. In the chronic pain patient sample, 38.4% (n = 38) were male and

61.6% (n = 61) were female. Regarding the student sample, 31.9% (n = 29) were male and 68.1% (n = 62) were female. A chi-square test was performed and there was not a relationship found between group assignment (simulation or honest responders) and sex of the participant (male or female); χ^2 (1, N = 190) = 4.08, p = 0.253. Age of participants ranged from 18 to 86 years (M = 35.39), with chronic pain patients being significantly older (M = 50.13, SD = 15.17) than the student population (M = 19.35, SD = 2.13); t(188) = 19.18, p < 0.001. In regards to between-group comparisons, the simulation collapsed group (M = 32.26, SD = 17.04) was significantly younger compared to the collapsed honest responder group (M = 38.66, SD = 20.34); t(188) = 2.35, p = 0.02. Within-group comparisons demonstrated no significant difference in age between students in the simulation (M = 19.22, SD = 2.44) versus honest responder condition (M = 19.51, SD = 1.69); t(89) = 0.649, p = 0.518. However, chronic pain patients in the honest responder condition (M = 53.75, SD = 14.74) were significantly older than individuals in the simulation group (M = 46.13, SD = 14.77), t(97) = 2.567, p = 0.012. The racial makeup of the whole sample was 73.2% Caucasian/White, 22.1% African American/Black, 2.1% Multiracial, 1.6% Hispanic/Latino, 0.5% Asian/Pacific Islander, and 0.5% Middle Eastern. Most of the racial diversity was found in the student sample. No relationship was found between group assignment (simulation vs. honest responder) and ethnicity of the participant; χ^2 (5, N = 190) = 6.99, p = 0.222. As for education, 52.6% had some college but no Bachelor's degree, 37.4% held a high school diploma/GED, 4.7% held a bachelor's degree, 2.6% held no high school diploma, 1.6% held a Master's/Doctoral degree, and 1.1% had some graduate school credit but no degree. No relationship was found between group assignment (simulation vs. honest responder) and level of education; χ^2 (5, N = 190) = 3.40, p = 0.639.

Within the chronic pain participant sample, there was not a significant difference between number of chronic pain conditions reported by individuals in the honest responder group (M = 2.37, SD = 1.48) and the simulation group (M = 2.38, SD = 1.24); $t(97) = -0.06$, $p = 0.949$. Overall, 84.8% (n = 84) of chronic pain participants had a history of lower back pain, 40.4% (n = 40) neck/shoulder pain, 38.4% (n = 38) arthritis/osteoarthritis, 25.3% (n = 25) nerve damage, 24.2% (n = 24) headaches/migraines, 1.0% (n = 1) multiple sclerosis, 1.0% (n = 1) fibromyalgia, and 15.2% (n = 15) reported one or more other chronic pain conditions (e.g., knee, foot, ankle pain, SI joint). Across the entire sample (chronic pain patients and students), 50.5% of participants had not been previously prescribed a narcotic, and 48.9% of participants had been previously prescribed a narcotic.

Measures

All study participants completed the following self-report measures.

Demographic Questionnaire. Participants completed a demographic questionnaire (see Appendix C) which included demographic information such as age, sex, gender, ethnicity, and level of education. To assist in identification of exclusion criteria, the demographic questionnaire also included questions regarding history of chronic pain diagnoses.

Patient-Reported Outcomes Measurement Information System (PROMIS). The National Institute of Health (NIH) developed a group of self-report measures designed to assess multiple facets of physical, mental, and social health (Askew et al., 2016). The PROMIS group of measures was developed using items from multiple instruments, in addition to expert collaboration in developing additional test items. The multiple measures have been adapted into a variety of formats including paper-pencil, fixed length or computer-adaptive testing, and short-forms. For the current study, short forms of the Pain Behavior, Pain Interference, and Pain

Table 1

Full Sample Demographics

Variable	*N(%)*	*M (SD)*
Gender		
Male	67 (35.3)	
Female	123 (64.7)	
Age		35.39 (18.95)
Race		
Caucasian	139 (73.2)	
African American/Black	42 (22.1)	
Multiracial	4 (2.1)	
Hispanic	3 (1.6)	
Asian American/Pacific Islander	1 (0.5)	
Middle Eastern	1 (0.5)	
Education		
Some College, No Bachelor's	100 (52.6)	
High School Degree/GED	71 (37.4)	
Bachelor's Degree	9 (4.7)	
No High School Diploma	5 (2.6)	
Master's Degree/Doctoral Degree	3 (1.6)	
Some Graduate school, but no degree	2 (1.1)	
History of Chronic Pain Condition		
Yes	99 (54.1)	
No	91 (45.0)	
Number of Chronic Pain Condition		1.31 (1.53)
Source of Chronic Pain Condition		
Low Back	91 (47.9)	
Neck/Shoulder Pain	42 (22.1)	
Arthritis/Osteoarthritis	38 (20.0)	
Headaches/Migraines	28 (14.7)	
Nerve Damage	26 (13.7)	

Table 1

Full Sample Demographics Continued…

Variable	*N (%)*	*M (SD)*
Multiple Sclerosis	1 (0.5)	
Fibromyalgia	1 (0.5)	
Other[a]	16 (8.4)	
History of being prescribed narcotics		
Yes	93 (48.9)	
No	96 (50.5)	

Note. The sample contained 190 participants.

[a] Within this group, 12 individuals have 1 other source of pain, 2 individuals had 2 other sources of pain, and 2 individuals had 3 other sources of pain.

Intensity scales were used. Overall, the PROMIS measures were published in 2012 and have limited reliability and validity studies; however, the PROMIS measures are being strongly encouraged for use in primary care settings (Amtmann et al., 2010; Askew et al., 2016; Flynn et al., 2015). Cook et al. (2016), Cella et al. (2010), and Rothrock et al. (2010) have reported that the PROMIS pain scales demonstrate clinical validity and correlate with other well-established scales.

PROMIS- Pain Behavior Short Form (PROMIS-PB). The PROMIS-PB (see Appendix D) was designed to identify the types of behaviors the chronic pain patient may be experiencing. It is a six-item scale that is rated on a six-point scale from 1 (Had no pain) to 6 (Always). The responses are combined into a total score (including T-score) with higher scores suggesting that the individual is engaging in more pain behaviors. The scores on the PROMIS-PB measure have been demonstrated to positively correlate with ratings of pain intensity (Cook, Schalet, Kallen, Rutsohn, & Cella, 2015; Pilkonis et al., 2015). Revicki et al. (2009) evaluated item-total correlations and internal consistency reliability (Cronbach's alpha) for the PROMIS-PB, and found that item-total correlations ranged from 0.44 to 0.87, and internal consistency reliability was 0.99. In the present study, the PROMIS-PB demonstrated strong internal consistency of 0.94. In terms of concurrent validity, Khanna et al. (2012) calculated the correlation between the PROMIS-PB and the Short Form 36-Item Health Survey Bodily Pain Index to be 0.66.

PROMIS- Pain Interference-Six Item (PROMIS-PI). The PROMIS-PI (see Appendix E) was designed to assess how pain interferes with an individual's daily functioning and daily activities. The instrument is a six-item scale that is rated on a five-point scale from 1 (Not at all) to 5 (Very much). The responses are combined into a total score (including T-score) with higher scores being consistent with greater interference from pain in daily life. For the PROMIS-PI

scale, Cella et al. (2010) reported the Cronbach's alpha internal consistency reliability estimate at 0.99 and reported that the adjusted item-total correlations ranged from 0.59 to 0.89. In the current study, the PROMIS-PI demonstrated strong internal consistency of 0.96. The PROMIS-PI scale has demonstrated acceptable concurrent validity with other measures related to pain (e.g., 0.78 with Brief Pain Inventory; 0.73 with SF-36 Bodily Pain), and has also demonstrated discriminant validity with scores on PROMIS measures of fatigue (0.48), anxiety (0.35), and depression (0.33), respectively) (Cook et al., 2015).

PROMIS-Pain Intensity Short Form (PROMIS-PIn). The PROMIS-PIn (Appendix F) was designed to assess the severity of pain symptoms with a three-item scale which is rated on a five-point scale from 1 (Had no pain) to 5 (Very severe). The responses are combined into a total score (including T-score) with higher scores being consistent with more intense pain. The PROMIS-PIn was modeled after more traditional numeric rating or visual analog-rating pain scales, and was expanded to inquire about an individual's average pain, worst pain over the past week, and the patient's current pain. The PROMIS-PIn has demonstrated acceptable concurrent validity with the pain severity scale and pain interference scales from the Brief Pain Inventory (0.83 and 0.74, respectively) (Cella et al., 2010). In the present study, the PROMIS-PIn demonstrated an internal consistency of 0.91.

Oswestry Disability Questionnaire (ODQ). The ODQ (Fairbank & Pynsent, 2000) is a 10-item scale which attempts to describe the chronic pain patient's ability to complete daily activities. Respondents endorse descriptions of functioning, and each item is rated on a six-point scale. The ODQ (see Appendix G) is scored by summing all items for a total score, and calculating a percentage of disability score, with higher scores suggesting greater levels of pain disability. Research has demonstrated that the measure has good 24-hour to four-day test-retest

reliability ranging from 0.91–0.99 (Fairbank & Pynsent, 2000), and internal consistency reliability (Cronbach's alpha) of 0.93 (Kim et al., 2015). In the present study, the ODQ demonstrated strong internal consistency of 0.96.

Short Form 36-Item Health Survey Version 2 (SF-36v2). The SF-36v2 (Ware, 2000) is a 36-item scale which focuses on the assessment of overall health. There are multiple subscales which assess specific health areas (Hawker et al., 2011). This measure (see Appendix H) has been included in multiple studies about the assessment of chronic pain (Amtmann et al., 2010; Hawker et al., 2011; Johnsen et al., 2013) and appears to have well-established reliability and validity. In the present study, the SF-36v2 demonstrated an internal consistency of 0.71. The two-item bodily pain subscale (SF-36v2-BP) assesses pain intensity rated on a six-point scale from 1 (None) to 6 (Very severe), and pain interference rated on a five-point scale from 1 (Not at all) to 5 (Extremely). The overall scale is scored on a range of 0–100, with 50 serving as an "average point" for the scale with higher scores indicating increased or "better" general health (Hawker et al., 2011). For the current study, comparisons between groups were made using the total score and the bodily pain subscale. In the present study, the SF-36v2-BP demonstrated an internal consistency of 0.87.

Pain Disability Index (PDI). The PDI (Tait et al., 1987) is a common screening instrument used in general specialist clinics (e.g., orthopedic, rheumatologic, and neurosurgical) to assess functional ability in a number of areas (e.g., occupational, social, sexual, activities of daily living) (Bianchini et al., 2014). The scale has seven items rated on an 11-point Likert scale from 0 (No disability) to 10 (Worst disability). The responses are combined into one total score with higher scores associated with increased pain-related disability; however, significantly elevated scores are associated with increased risk of malingering. The PDI (see Appendix I) has

been well documented to have good one-week test-retest reliability(r = 0.91) (Gronblad, 1993) and good internal consistency (α = 0.74–0.86). The PDI has also demonstrated strong correlations with other pain disability measures (e.g., ODQ, r = 0.86–0.90) (Crighton et al., 2014; Gronblad, 1993; Tait, Chibnall, & Krause, 1990). In recent literature, the PDI has demonstrated some utility in detecting malingered pain-related disability in medico-legal contexts using the following cut off scores: $\geq$ 62, malingering likely; 55–61, malingering probable but cannot be reliably differentiated; <55, malingering unlikely (Bianchini et al., 2014). The current study utilized the recommended cut-off scores to determine the effectiveness of differentiating between malingerers and honest responders. In the present study, the PDI demonstrated strong internal consistency of 0.97.

Modified Somatic Perceptions Questionnaire (MSPQ). In addition to the PDI, the MSPQ (Main, 1983) is also a common screening instrument used in general specialist clinics (e.g., orthopedic, rheumatologic, and neurosurgical) (Bianchini et al., 2014). The measure was initially developed to assess distress in back pain patients but has been utilized in a variety of settings with multiple conditions (Crighton et al., 2014). The MSPQ (see Appendix J) is a 13-item scale which is rated on a four-point Likert scale with responses from 0 (Not at all) to 3 (Extremely, could not have been worse). The responses are combined into a total score and higher scores have been associated with increased pain-related impairment, general distress, and negative affectivity (Hawker et al., 2011). Overall, the MSPQ has been documented to have good internal consistency (α = 0.78) (Bianchini et al., 2014). In the present study, the MSPQ demonstrated strong internal consistency of 0.96. Significantly elevated scores are associated with increased risk of malingering. In recent literature, the MSPQ has demonstrated slightly higher utility than the PDI in detecting malingered pain-related disability in medico-legal

contexts using the following cut off scores: ≥ 17, malingering likely; 10–16; malingering probable but cannot be reliably differentiated; <10, malingering unlikely (Bianchini et al., 2014). The current study utilized the recommended cutoff scores to determine the effectiveness of differentiating between malingerers and honest responders.

Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R). The SOAPP-R (Butler et al., 2009) is a 12-item scale rated on a 5-point Likert scale with responses from 0 (Never) to 4 (Very Often). The responses are combined into one total score with higher scores indicating a greater risk for opioid abuse. The SOAPP-R (see Appendix K) was developed to decrease the transparency of the questions regarding substance abuse found on the original version, and has demonstrated a specificity of 0.68 and sensitivity of 0.80 for identifying patients at higher risk of substance abuse using the recommended cutoff score of greater than or equal to 18. Butler et al. (2008) reported that the SOAPP-R demonstrated five-month test-retest reliability of 0.94 and good internal consistency ($\alpha = 0.86$). In the present study, the SOAPP-R demonstrated an internal consistency of 0.90.

Patient Health Questionnaire-Nine Item (PHQ-9). The PHQ-9 (Kroenke & Spitzer, 2002) is a nine-item screener for symptoms of depression that is rated on a four-point Likert scale with responses from 0 (Not at all) to 3 (Nearly every day). The PHQ-9 (see Appendix L) is scored using a total score with higher scores suggesting the individual is experiencing more severe symptoms of depression. The measure is reported to have good internal consistency ($\alpha = 0.87$), and one-week test-retest reliability ($r = 0.81–0.96$) (Bombardier & Smiley, 2015). In the present study, the PHQ-9 demonstrated an internal consistency of 0.92. This measure is often used in chronic pain research (Johnsen et al., 2013; Poleshuck et al., 2010) and is commonly used in primary care settings (Cameron, Crawford, Lawton, & Reid, 2008; Löwe et al., 2008). In

a study completed by Dum, Pickren, Sobell, and Sobell (2008) with substance abuse populations, the PHQ and Beck Depression Inventory were highly correlated ($r = 0.91$).

Generalized Anxiety Scale- Seven Item (GAD-7). Another commonly used measure in primary care is the GAD-7 (Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007), a seven-item anxiety symptom screener that is rated on a 4- point scale with responses from 0 (Not at all) to 3 (Nearly every day). The GAD-7 (see Appendix M) is scored using a total score with higher scores suggesting the individual is experiencing more severe symptoms of anxiety. The GAD-7 has well established internal consistency ($\alpha = 0.92$) (Mills et al., 2014) and test-retest reliability, and (Löwe et al., 2008; Seo & Park, 2015) has demonstrated a sensitivity of 80% and specificity of 86% for identifying anxiety conditions in substance users when using a cut-off score of ≥ 9 (Delgadillo et al., 2012). In the current study, the GAD-7 demonstrated an internal consistency of 0.93. The GAD-7 is correlated with other measures of anxiety such as the Beck Anxiety Index ($r = 0.76$) in pain populations (Seo & Park, 2015).

Procedures

Chronic pain patient participants were recruited from Union Health Pain Clinic in Terre Haute, IN. Participants were invited to participate at their regularly scheduled appointments and were offered an opportunity to enter to win a $20.00 gift card for their participation in the study. Undergraduate college students were recruited through the ISU SONA-Online Research Sign-Up System and were provided course credit after completing the measures. All participants completed informed consent forms prior to data collection and all participants were debriefed about the study at the conclusion of the testing session.

Following completion of necessary consents, all participants were randomly assigned to one of two groups: the simulation group or the honest responder group. Simulation participants

were given a scenario (provided below) and asked to use this information to complete the study measures as though they were the person in the scenario who is drug-seeking. Chronic pain patients were reassured multiple times that their assignment to the simulation group was random and did not reflect any aspect of their current treatment at the pain clinic. The scenario is modified from scenarios used by Bianchini et al. (2014) and Quinn (2003).

> "Imagine that you have been in an accident and suffered an injury to your neck, shoulder and back. Initially you experienced long-lasting pain but now that you are mostly healed, you have hardly any pain, and you are experiencing no further significant problems due to the injury. However, you were previously prescribed prescription pain medication and you would like to continue to have the medication even though you no longer have any pain. In order to get pain medications, you need to convincingly act like a person who has pain. Your task today is to complete the following questionnaires as if you were experiencing severe, persistent, pain in order to obtain narcotic pain medications (e.g., Percocet, Oxycodone, OxyContin, Norco)."

After being presented with the scenario, simulation participants were given the following instructions:

> "Imagine yourself as the person in the above scenario and try to fill out the following questionnaires while convincingly acting like someone who is trying to obtain prescription pain medications by presenting with pain symptoms. Please be aware that the following measures are able to detect individuals attempting to fake pain."

Honest responder participants did not read any scenario and were only given the following instructions:

> "Please fill out the following questionnaires honestly."

All chronic pain participants were offered a financial incentive for their participation. Incentives have demonstrated some performance enhancement in malingering simulation research (Elhai et al., 2007). All chronic pain participants who completed the questionnaires had the opportunity to win a $20.00 gift card for Amazon.com. A total of four gift cards were given, with one participant from each of the four groups being randomly selected to receive a gift card. Individuals interested in being placed in the drawing for the gift cards were asked to provide a valid email address in order to be contacted after the study. Email addresses were stored separately from consent forms in order to protect the anonymity of participants.

Following the presentation of instructions, participants were then asked to give the researcher an oral summary regarding what s/he understood they were to do for the study as a manipulation check. If the researcher believed that the individual did not understand the task, the participant was asked to reread the scenario and summarize the task again. No participants were eliminated due to failure to correctly summarize the task on the second attempt.

All pain patient participants completed the measures in an individual setting using paper-pencil format. Group assignment was determined by drawing a card from a hat. College students were randomly assigned based on appointment times selected through SONA. College students in the honest responder condition were given the option of completing the questionnaires individually or in a small group (e.g, 5–10 participants) setting using paper-pencil format. College students assigned to the simulation condition completed the questionnaires individually using a paper pencil format.

Data Analysis

All scoring of standardized measures was completed according to the standardized instructions included in the manuals or standardized instructions for each assessment instrument.

To ensure accuracy of scoring and data entry of all measures, cross-checking of scoring was conducted and a random subset of the data was inspected to ensure accuracy of data entry.

Descriptive statistics were performed to examine participant characteristics, and measures were evaluated for internal consistency. For Hypothesis 1, overall comparisons between groups' total scores on the pain-related questionnaires were completed using individual t-tests comparing collapsed simulator and honest responder groups. Additionally, individual t-test analyses were completed to make within- and between-group comparisons for the chronic pain patient and college student simulator and honest responder groups. Hypothesis 2 was tested using individual t-tests for between collapsed group comparison, and for within group comparisons for the PDI and MSPQ. Chi-Square analysis was used to test the goodness of fit between the groups' total scores and known-group membership. Overall between- and within-groups' total score comparisons on the SOAPP-R for Hypothesis 3 were completed using individual t-tests. Chi-Square analysis was used to test the goodness of fit between the groups' total scores and known-group membership. For Hypothesis 4, overall comparisons between-groups' total scores on the PHQ-9 and GAD-7 were completed using individual t-tests. Individual t-test analyses were completed to determine level of significance between and within the college student and chronic pain patient simulators and honest responder groups.

CHAPTER 4

RESULTS

Data was analyzed using the IBM SPSS statistical software version 19 (IBM Corp., 2010). The first step in data analysis involved examining the data for outliers or excessive missing data. Participants with excessive missing data were eliminated. Additionally, participants in the pain patient population who reported not having a chronic pain condition and students reporting they had a chronic pain condition were eliminated. The means and standard deviations for the measures included in the present study can be found in Table 2. A summary of Pearson correlations between measures for each of the participant groups can be found in Table 3 and Table 4.

Pain Severity, Discomfort, and Disability Measures

The first hypothesis predicted that participants asked to feign chronic pain and engage in drug-seeking behaviors would endorse higher pain severity, pain interference, disability, and engagement in pain behaviors as compared to honest responders. Additionally, participants asked to feign chronic pain and engage in drug-seeking behaviors would also report poorer general health compared to honest responder participants. Performance across the PROMIS-PB, the PROMIS-PI, the PROMIS-PIn, ODQ, and the SF36v2 was used to examine this hypothesis. On the PROMIS-PB, participants in the simulation condition reported significantly higher pain behavior ratings compared to the participants in the honest responder condition $t(149) = -7.21$, p

< 0.001, *d = -1.05*. Within-group comparisons demonstrated no significant difference between pain behavior ratings of students and chronic pain patients in the simulation condition; *t*(95) = 0.36, *p* = 0.723, *d = 0.07*. Similar performance was observed on the PROMIS-PI with participants in the simulation condition reporting significantly higher pain interference ratings compared to the honest responder condition *t*(138) = -8.99, *p* < 0.001, *d* = 1.31. Within-group comparisons demonstrated no significant difference between pain interference ratings of students and chronic pain patients in the simulation condition; *t*(93) = -0.50, *p* = 0.620, *d* = -0.10. On the PROMIS-PIn, participants in the simulation condition reported significantly higher total pain intensity compared to participants in the honest responder condition *t*(155) = -8.23, p < 0.001, *d* = -1.20. Within-group comparisons demonstrated no significant difference between pain intensity ratings of students and chronic pain patients in the simulation condition; *t*(95) = 0.22, *p* = 0.825, *d* = 0.04. On the ODQ, patients in the simulation condition reported significantly higher disability ratings compared to the honest responder condition *t*(180) = -10.58, *p* < 0.001, *d* = -1.54. Within group comparisons demonstrated no significant difference between disability ratings of students and chronic pain patients in the simulation condition; *t*(95) = -0.47, *p* = 0.643, *d* = -0.09. In regard to general health as measured by the SF-36v2 (higher scores indicating more positive views of health), participants in the simulation condition reported overall poorer health compared to participants in the honest responder condition *t*(158) = 9.19, *p* < 0.001, *d* = 1.34. There was no significant difference between students and chronic pain patients in the simulation condition (*t*(95) = -1.69, *p* = 0.094, *d* = -0.34). On the bodily pain subscale of the SF36v2, the simulation participant group reported higher bodily pain and discomfort compared to the honest responder group (*t*(134) = 8.48 , *p* < 0.001, *d* = 1.24). There was no significant difference

between the chronic pain patients and students in the simulation condition; $t(95) = -0.65$, $p = 0.517$, $d = -0.13$.

The first hypothesis also predicted that chronic pain patients in the honest responder group would endorse significantly higher levels of pain and report greater functional impairment as compared to students in the honest responder condition. This was found for all relevant questionnaires. More specifically, on the PROMIS-PB, chronic pain patients in the honest responder condition endorsed significantly higher ratings of pain behaviors compared to students in the honest responder condition; $t(49) = 5.731$, $p < 0.001$, $d = 1.25$. On the PROMIS-PI, chronic pain patients in the honest responder condition reported significantly higher pain interference ratings compared to students in the honest responder group; $t(64) = 7.631$, $p < 0.001$, $d = 1.63$. On the PROMIS-PIn, chronic pain patients in the honest responder condition reported significantly higher pain intensity than students in the honest responder condition; $t(86) = 11.11$, $p < 0.001$, d 2.32. Chronic pain patients in the honest responder condition reported significantly higher disability percentages on the ODQ as compared to students in the honest responder condition; $t(85) = 12.48$, $p < 0.001$, $d = 2.53$. On the SF-36v2 (higher scores indicating more positive views of health), chronic pain patients in the honest responder condition reported significantly poorer general health compared to students in the honest responder condition; $t(89) = -11.18$, $p < 0.001$, $d = -2.99$. In regard to the SF-36v2 Bodily Pain Scale, chronic pain patients in the honest responder group reported significantly more bodily pain and discomfort compared to students in the honest responder group; $t(91) = -14.53$, $p < 0.001$, $d = -2.92$.

Medico-Legal Measures: PDI & MSPQ

The second set of hypotheses (Table 2) focused on two measures used in medico-legal contexts, the Pain Disability Index (PDI) and Modified Somatic Perceptions Questionnaire (MSPQ). First, it was expected that both the student and chronic pain patient simulation groups would have total scores on the PDI and MSPQ which exceeded established cut-off scores for likely malingering (PDI: $\geq$ 62, MSPQ: $\geq$17, respectively). The simulation group, overall, did not have scores which exceeded established cutoffs for likely malingering on the PDI. However, a relationship was found between group assignment (simulation vs. control condition) and classification of malingering risk on the PDI; χ^2 (2, N = 188) = 40.75, $p < 0.001$. Overall, 70.2% (n = 132) of participants were classified correctly using established cut-off scores. Specifically, 21.6% (n = 21) of participants in the simulation condition were correctly identified as likely malingering and 26.8% (n = 26) were identified as probable malingering. In addition, 93.4% (n = 85) of honest responders were correctly identified as honest responders. In contrast, 29.8% (n = 56) of participants were incorrectly classified using established cut-off scores, with 51.1% (n = 50) of simulators being incorrectly identified as honest responders, 2.2% (n = 2) of honest responders incorrectly identified as likely malingering, and 4.4% (n = 4) of honest responders incorrectly identified as probable malingering.

Regarding performance on the MSPQ, the simulation group exceeded established cutoffs, and a chi-square analysis found a relationship between group assignment (simulation vs. control condition) and classification of malingering risk on the MSPQ; χ^2 (2, N = 190) = 52.65, $p <$ 0.001. Overall, 74.2% (n = 141) of participants were classified correctly using established cut-off scores. Specifically, 49.5% ($n = 48$) of participants in the simulation condition were correctly identified as likely malingering and 20.6% ($n = 20$) were identified as probable malingering. In

addition, 78.5% (n = 73) of honest responders were correctly identified as honest responders. In contrast, 25.8% (n = 49) of participants were incorrectly classified using established cut-off scores, with 29.9% (n = 29) of simulators being incorrectly identified as honest responders, 6.5% (n = 6) of honest responders incorrectly identified as likely malingering, and 15.1% (n = 14) of honest responders incorrectly identified as probable malingering.

It was also predicted that students in the simulation condition would endorse significantly more disability than chronic pain patients in the simulation condition. On the PDI, students in the simulation condition did not endorse significantly more disability compared to chronic pain patient participants in the simulation condition; $t(95) = 0.39$, $p = 0.694$, $d = 0.08$. Likewise, students did not endorse higher levels of somatic symptomatology on the MSPQ compared to chronic pain patient participants in the simulation condition; $t(95) = -1.28$, $p = 0.204$, $d = -0.26$.

Finally, both the chronic pain patient and student honest responder groups were expected to remain below the established cut-off scores established for probable (PDI: 55–61; MSPQ: 10–16 respectively) and likely malingering (PDI: $\geq$ 62, MSPQ: $\geq$17 respectively). As predicted, chronic pain patients and students in the honest responder condition remained under established cut-off scores for the PDI and the MSPQ.

Substance Abuse Measure

The third hypothesis focused on the use of an established opioids-specific substance-abuse risk scale in detecting feigned chronic pain. It was predicted that students in the simulation condition would obtain higher scores on the SOAPP-R than all other groups, exceeding established cut-off scores of >18. Overall, the collapsed simulation group's average score on the SOAPP-R exceeded the established cut-off scores for a positive screen, and a relationship was found between group assignment (simulation vs. honest responder condition) and classification

of abuse and drug-seeking risk on the SOAPP-R; χ^2 (1, N = 190) = 57.63, p < 0.001. However, contrary to prediction, there was not a significant difference between chronic pain patients and students in the simulation condition; t(93) = 0.35, p = 0.733, d = 0.07. Both groups exceeded established cut-off scores for a positive screen. Specifically, 55.3% (n = 26) of chronic pain patients and 64% (n = 32) of students in the simulation condition were identified as having a positive screen, compared to 9.6% (n = 5) of chronic pain patients and 4.9% (n = 2) of students in the honest responder condition.

It was also predicted that there would not be a significant difference between chronic pain patients in the simulation condition and those in the honest responder condition. This prediction was not supported with chronic pain patients in the simulation condition obtaining significantly higher scores compared to chronic pain patients in the honest responder condition; t(73) = -4.97, p < 0.001, d = 1.04.

Psychiatric Symptomatology Measures

The fourth set of hypotheses focused on psychiatric screeners for depression (PHQ-9) and anxiety (GAD-7). First, it was predicted that the simulation groups would report higher levels of depression and anxiety than the honest responder groups. As expected, participants in the simulation condition endorsed significantly higher levels of depressive symptoms compared to honest responder participants; t(182) = -5.67, p < 0.001, d = -0.84. Likewise, participants in the simulation group endorsed higher anxiety symptom severity compared to honest responder participants, t(183) = -4.71, p < 0.001, d = -0.70.

It was also predicted that college students in the simulation condition would report significantly higher levels of depression and anxiety relative to chronic pain patients in the simulation condition. However, this hypothesis was not supported, as there was not a significant

difference between chronic pain patient participants' endorsement of depressive symptoms compared to students in the simulation condition); $t(94) = 1.03$, $p = 0.308$, $d = 0.21$. Similarly, there was not a significant difference between chronic pain patients' endorsement symptoms of anxiety and students' report of anxiety symptoms in the simulation condition ($t(94) = 1.27$, $p = 0.206$, $d = 0.26$).

Finally, it was predicted that there would be no significant difference between the chronic pain patient and student honest responder groups' endorsement of symptoms of anxiety and depression. This prediction was supported due to no significant difference on endorsement of symptoms of depression by chronic pain patients and college students, $t(86) = 0.04$, $p = 0.972$, $d = 0.01$, and no significant difference on endorsement of symptoms of anxiety by chronic pain patients and college students, $t(87) = -1.14$, $p = 0.254$, $d = -0.24$.

Table 2

Means and Standard Deviations by Condition

		PROMIS Pain Behavior SF-7	PROMIS Pain Interference SF-6	PROMIS Pain Intensity SF-3	ODQ	SF-36 V2 Total Score[a]	SF-36 V2 Bodily Pain[a]
	N	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*
Collapsed Control	93	57.48(10.18)	59.50(9.82)	49.67(11.36)	26.48(22.45)	51.59(23.61)	51.00(29.89)
Chronic Pain	52	62.42(4.50)	65.09 (5.84)	57.28(7.43)	41.89(16.85)	36.02(18.01)	29.12(18.34)
Students	41	51.22(11.86)	52.42(9.28)	40.01(7.46)	6.94(9.78)	71.34(12.39)	78.75(14.60)
Collapsed Simulation	97	66.30(6.09)	69.80(5.20)	61.09(7.24)	58.48(19.02)	24.84(15.49)	21.76(14.89)
Chronic Pain	47	66.53(5.09)	69.53(4.68)	61.26(6.46)	57.55(18.74)	22.13(14.76)	20.74(14.37)
Students	50	66.09(6.95)	70.06(5.67)	60.94(7.98)	59.36(19.43)	27.40(15.88)	22.72(15.44)

Note: [a] denotes that scoring is reversed with lowers scores representing increased bodily pain and poorer general health; ODQ (Oswestry Disability Questionnaire).

Table 2

Means and Standard Deviations by Condition Continued.

		PDI	MSPQ	SOAPP-R	PHQ-9	GAD-7
	N	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*
Collapsed Control	93	20.99(20.07)	6.19(5.45)	10.22(6.69)	7.68(5.79)	6.03(5.34)
Chronic Pain	52	33.97(16.47)	6.15(5.27)	10.90(6.98)	7.70(5.89)	5.44(5.53)
Students	41	4.54(9.19)	6.24(5.74)	9.44(6.33)	7.66(5.75)	6.73(5.09)
Collapsed Simulation	97	50.01(14.64)	17.02(9.71)	20.22(10.10)	13.26(7.38)	10.14(6.40)
Chronic Pain	47	50.62(15.59)	15.72(9.53)	20.60(11.21)	14.07(7.97)	11.00(6.98)
Students	50	49.44(13.82)	18.24(9.82)	19.88(9.08)	12.52(6.80)	9.34(5.77)

Note: PDI (Pain Disability Index), MSPQ (Modified Somatic Perceptions Questionnaire), established medico-legal cut off scores are as follows: PDI, <55 malingering unlikely, 55–61 probable but cannot be reliably differentiated, > 62 malingering likely; MSPQ: <10 malingering unlikely, 10–16 probable but cannot be reliably differentiated, >17 malingering likely, SOAPP-R (Screener and Opioid Assessment for Patients with Pain-Revised); established cut-off scores: >18 positive screen, <18 negative screen.

Table 3

Correlations Between All Measures for Honest Responder Participants

	PROMIS Pain Behavior SF-7	PROMIS Pain Interference SF-6	PROMIS Pain Intensity SF-3	ODQ	SF-36 V2 Total Score	SF-36 V2 Bodily Pain	PDI	MSPQ	SOAPP-R	PHQ-9
PROMIS-PI	0.83**									
PROMIS-PIn	0.76**	0.84**								
ODQ	0.63**	0.78**	0.81**							
SF-36 V2 Total Score	-0.50**	-0.62**	-0.67**	-0.80**						
SF-36-V2 Bodily Pain	-0.65**	-0.69**	-0.80**	-0.78**	0.74**					
PDI	0.59**	0.76**	0.77**	0.89**	-0.73**	-0.75**				
MSPQ	0.33**	0.35**	0.25*	0.22*	-0.21*	-0.21*	0.33**			
SOAPP-R	0.38**	0.46**	0.26*	0.38**	-0.40**	-0.23*	0.46**	0.50**		
PHQ-9	0.21*	0.23*	0.11	0.23*	-0.39**	-0.10	0.27*	0.56**	0.65**	
GAD-7	0.40	0.09	0.00	0.02	-0.17	0.04	0.04	0.44**	0.52**	0.71**

Note: * $p<0.050$, ** $p<0.000$.

Table 4

Correlations Between all Measures for Simulation Participants

	PROMIS Pain Behavior SF-7	PROMIS Pain Interference SF-6	PROMIS Pain Intensity SF-3	ODQ	SF-36 V2 Total Score	SF-36 V2 Bodily Pain	PDI	MSPQ	SOAPP-R	PHQ-9
PROMIS-PI	0.73**									
PROMIS-PIn	0.63**	0.70**								
ODQ	0.50**	0.59**	0.66**							
SF-36 V2 Total Score	-0.48**	-0.55**	-0.57**	-0.73**						
SF-36-V2 Bodily Pain	-0.56**	-0.70**	-0.69**	-0.68**	0.76**					
PDI	0.56**	0.61**	0.56**	0.75**	-0.75**	-0.67**				
MSPQ	0.35**	0.36**	0.35**	0.47**	-0.48**	-0.40**	0.42**			
SOAPP-R	0.32**	0.25*	0.22*	0.37**	-0.49**	-0.31**	0.33**	0.43**		
PHQ-9	0.30**	0.27**	0.26*	0.47**	-0.64**	-0.41**	0.53**	0.49**	0.79**	
GAD-7	0.34**	0.27**	0.25*	0.42**	-0.57**	0.37**	0.48**	0.51**	0.77**	0.88**

Note: * $p<0.050$, ** $p<0.000$.

CHAPTER FIVE

DISCUSSION

Overview

The purpose of this study was to explore the effectiveness of commonly used physical and mental health self-report measures in detecting malingered chronic pain and drug-seeking in a primary care setting. Providing treatment for chronic pain in a primary care setting is a unique challenge that is fraught with challenges for providers who often feel "stressed" or "overwhelmed" by the challenges related to distinguishing genuine versus feigned symptoms, and identifying effective strategies for assessment and management of pain symptoms (Anderson et al., 2013; Bhamb et al., 2006; Dougherty, 2012; Jamison et al., 2014; Manjiani et al., 2014; Volkow & McLellan, 2016). There is currently limited research on effective assessment strategies for drug seeking and feigned symptoms of pain. In the on-going "opioid epidemic", primary care physicians are in the spotlight as both the cause and future solution regarding opioid prescriptions, but there is limited research to guide physicians about how to improve their standard of care (Volkow & McLellan, 2016). Recommendations from the American Pain Society and Agency for Healthcare Policy and Research continue to recommend that physicians trust patients' self-reported pain (Tuck, Johnson, & Bean, 2018), but then physicians are

sometimes penalized for under- or over-treating pain symptoms in their patients. Therefore, more attention on how to best collect self-reported pain information is warranted.

A review of the extant literature reveals that commonly used physical exam strategies (e.g., Waddell signs) are ineffective in detecting feigned pain symptoms (Fishbain et al., 2003; Fishbain et al., 2004; Siqueira & Morete, 2014; Tuck et al., 2018). Furthermore, most of the studies done on the assessment of malingered pain using subjective and objective measures are specifically related to forensic disability cases or involve the use of psychological measures which involve long administration times and interpretation of complex profiles. Traditional psychological measures are too cumbersome for physicians to use in the fast-paced environment of primary care. Instead, the field may benefit from evaluating current accepted self-report measures used in primary care and brief measures from the forensic field to look for new ways these measures may assist physicians in assessing and treating their patients with chronic pain. By better understanding the potential value of the current measures, the field can then begin to tailor updated recommendations to assist physicians in recognizing 'red flags' in patient presentations or at least better put the patient report into a broader context which is necessary to better manage chronic pain (Tuck et al., 2018). Therefore, the current study is a first step in exploring how chronic pain patients and non-chronic pain patients might respond to specific measures commonly given in primary care settings when malingering for the purposes of drug seeking. At this time, none of the measures used in the current study have been utilized outside the forensic realm to evaluate the instrument's effectiveness in assessing genuine versus feigned chronic pain. This study begins to fill the gap in the current research.

Pain Severity, Discomfort, and Disability Measures

It was hypothesized that individuals asked to malinger chronic pain would endorse items and obtain scores suggesting significantly higher levels of pain and greater functional impairment across pain-related measures compared to those in the honest responder condition. It was also expected that honest responder chronic pain patients would endorse significantly higher levels of pain and report greater functional impairment as compared to college student honest responders. All of these findings were supported. These findings are consistent with the study by Grover et al. (2012) which found that in the emergency room individuals demonstrating drug-seeking behaviors tended to rate their pain significantly higher than patients who did not have drug-seeking/addiction problems on their problems lists. Although participants in the present study did not endorse pain at the maximum levels as seen in the Grover et al. (2012) study, the pattern of reporting increased severity of symptoms is consistent across the broader feigning/malingering literature focused on various conditions/diagnoses such as ADHD, cognitive deficits, and psychosis (Booksh, 2005; Duncan, 2005; Harp et al., 2011; Harrison et al., 2007; Tuck et al., 2018).

This finding does not provide definitive evidence that high pain and disability ratings are directly related to feigned/malingered pain symptoms. Such conclusions would be complicated by a number of factors. First, it is often assumed that pain is the direct result of an identifiable cause (e.g., tissue damage); however, Tuck et al. (2018) estimate that up to 85% of pain patients report pain related to no identifiable process. There is also no expected amount of pain or disability rating given a specific injury or condition, and there is evidence that central sensitization (amplification of pain in the spinal cord) also plays a strong role in an individual's perception of pain (Tuck et al., 2018). Secondly, how individuals interpret what qualifies as

mild, moderate, or severe pain is also heavily subjective. Chanques et al. (2010) demonstrated that when assessing pain symptoms in ICU patients using five different pain intensity and disability scales, ratings were variable across the measures when administered consecutively. This suggests that how individuals interpret the question may heavily influence how they respond or rate their pain on a specific measure. For example, in the present study, participants were asked consecutively to rate their pain intensity on the PROMIS-PIn ('*What is your level of pain right now?*' rated on a 5 point Likert scale with 1 representing no pain and 5 representing severe pain) and the ODQ ('Pain Intensity' with individuals identifying one of 6 statements '*The pain is* mild, moderate, fairly severe, etc *at this moment*'). Individuals in the honest responder groups maintained comparable ratings of mild pain across both measures, whereas the experimental group rated their pain as moderate on the PROMIS-PIn and fairly severe on the ODQ. However, it cannot be ruled out that the order in which questions were asked did not influence the results because the measures were administered in the same order. Additionally, it cannot be ruled out that reading level of the individual and vocabulary used in the question may influence the way individuals responded to the question. For example, on the PROMIS-PB, multiple participants were unsure what the word 'grimaced' meant and reported that they changed their rating following the examiner clarifying what the word meant. It is unclear how many other participants had similar confusion about the word or other phrases and did not ask for clarification.

Finally, although the current data demonstrated that individuals in the simulation groups reported significantly higher levels of disability compared to honest responder groups, this conclusion is based on average scores. Score ranges across participants in all four categories varied, and simulation and honest responder group scores heavily overlapped across multiple

measures. Therefore, pain and disability ratings may tend to be higher in individuals who are feigning pain symptoms, but are not conclusive in the absence of other information. Pain has repeatedly been described as a subjective process and, therefore, pain intensity and disability ratings are just that—subjective and inconclusive as a sole measure of malingering and drug-seeking.

Medico-Legal Measures: PDI & MSPQ

It was hypothesized that both simulation groups would exceed the cut-off scores for malingering on the PDI and MSPQ, but the college student simulators were expected to endorse more items than the chronic pain patient simulators. It was also expected that participants in the honest responder conditions would remain below the cut-off scores established to identify possible malingerers. Some of these findings were supported, but it was found that college student and pain patient simulators did not significantly differ in endorsement of items across both measures.

The simulation group as a whole did not have scores which suggested probable or likely malingering on the PDI, but did on the MSPQ. These results are inconsistent with the previous forensic-based study by Bianchini et al. (2014) which compared chronic pain patients to college students simulating pain and found that the MSPQ and PDI were both able to distinguish between malingered pain-related disability and non-malingered pain-related disability. In contrast, the present results are more similar to the results of Crighton et al. (2014) who reported that the MSPQ demonstrated a stronger ability to differentiate between groups than the PDI. In the current study, using the recommended cut-off score of $\leq$62, the sensitivity of the PDI was 47.4% which was comparable to the 10–47% sensitivity reported by Crighton et al. (2014) and higher than the 24% reported by Bianchini et al. (2014). In contrast, the current study

demonstrated a slightly higher specificity of 93.4% compared to 67–91% specificity reported by Crighton et al. (2014). The positive predictive power (PPP) in the current study was 88.5% and demonstrated a negative predictive power (NPP) of 62.5%. Using a cut-off score of ≤17, the sensitivity for the MSPQ was 69.1% across collapsed groups was lower than the 76–84% sensitivity reported by Crighton et al. (2014), but significantly higher than the 39% sensitivity reported by Bianchini et al. (2014). Likewise, the current MSPQ data demonstrated specificity of 77.3%, which was comparable to the 52–76% specificity reported by Crighton et al. (2014). In the current study, the MSPQ demonstrated a PPP of 77.0% and NPP of 69.4%. The PDI incorrectly labeled 6.6% (N = 6) of honest responders as malingering and 52.6% (N = 51) of simulators as responding honestly, as compared to the MSPQ labeling 22.7% honest responders as malingering and 30.9% of simulators as honest responders. Overall, the present findings do not provide evidence that previously recommended cut-off scores for the PDI or MSPQ used in isolation are an effective strategy for identifying drug-seeking behavior or feigned pain symptom reporting in non-litigation populations. In previous literature, Crighton et al. (2014) utilized a population including approximately 144 disability litigants and 154 non-litigating chronic pain patients who were receiving treatment at a chronic pain clinic, using MMPI-2RF cut-off scores for over-reporting as a method to assign individuals into credible and non-credible response groups. Bianchini et al. (2014) utilized referrals to a university clinic for psychological pain evaluations compared to a college student simulator design and utilized Malingered Pain Related Disability to assign participants to one of seven groups based on the Bianachini et al's (2005) criteria for malingered pain-related disability. The current study is one of the first studies to use a known simulation design across pain and college student populations.

For the second part of the hypothesis, it was assumed that the chronic pain patients' knowledge about chronic pain (based on having a pain condition) and experience with medical assessment of chronic pain symptoms would result in more sophisticated response patterns on the PDI and the MSPQ than college students. Such assumptions are based on previous studies (e.g., Suhr & Gunstad, 2007) which demonstrated that knowledge about a specific condition or diagnosis generally results in utilization of more sophisticated feigning techniques on self-report measures related to that specific condition. The present data is inconsistent with these findings and, instead, was more consistent with the literature demonstrating mixed results about the positive effects of knowledge on successful feigning/malingering (e.g., Edmundson, 2014; Rios & Morey, 2013; Tucha, Sontag, Walitza, & Lange, 2009). The hypothesis that participants in the honest responding conditions as a whole would remain below the cut-off scores established to identify possible malingerers was supported by the data.

Substance Abuse Measure

The SOAPP-R was used in this study as a measure of substance abuse. Although it was hypothesized that college student simulators would endorse more items on the SOAPP-R than chronic pain patient simulators, this finding was not supported. College students and chronic pain patient simulators both had elevated scores on the SOAPP-R. It was assumed that chronic paint patients would demonstrate more sophisticated response patterns given their knowledge and experience in the healthcare system and not present significantly different than honest responder pain patients. As seen with the PDI and MSPQ, these assumptions were not supported. This finding was particularly striking given the assumption that many patients receiving treatment for chronic pain are often subjected to extensive conversations about pain medication use with treatment providers (Becker et al., 2018). These conversations were expected to result

in chronic pain patients being more sensitive to these types of questions and, thus, responding to them in a way which did not trigger a positive screen for potential opiate abuse. However, of note, multiple genuine pain patients made comments about how 'drug-seekers' would just 'endorse everything' and not be 'that savvy.' Thus, it is likely that assumptions the chronic pain patients have about naïve strategies used by individuals who engage in drug-seeking behaviors may have influenced the way individuals in the simulation group responded.

In the present study, the SOAPP-R demonstrated a sensitivity of 59.8% and a specificity of 92.5%, which is inconsistent with findings from Butler et al. (2009) of 80% sensitivity and 68% specificity using medical center patients who were prescribed opioids. In the present study, the SOAPP-R demonstrated a PPP of 31.2% and a NPP of 10.8%. Again, the present study utilized a known-group design to assign participants to simulation and honest responder groups, which contrasts with the method utilized by Butler et al. (2009) who used the Aberrant Drug Behavior Index (ADBI) to classify which patients were misusing medications. Given the present findings and the previous literature, it is not conclusive that the SOAPP-R could be used in isolation to determine which patients are at risk of misusing opioids, but more research is warranted given that chronic pain patient simulators produced elevated scores despite the face-validity of the measure. Although, as originally stated by Butler et al. (2009), further exploration and development of such screeners is important in improving physicians' ability to identify warning signs for misuse of medications.

Psychiatric Symptomatology Measures

Lastly, it was hypothesized that both simulation groups would report higher levels of depression and anxiety than the honest responder groups. It was also expected that college student simulators would report significantly higher levels of depression and anxiety relative to

chronic pain patient simulators. There was no significant difference expected between the student and chronic pain patient control groups' endorsement of psychological symptoms. Many of these findings were supported, with the exception that college student simulators did not endorse significantly higher levels of depression and anxiety compared to their pain patient counterparts.

The current findings were consistent with the previous literature which demonstrates that individuals asked to simulate symptoms of a specific impairment (e.g., pain symptoms) not only demonstrate deficits in that area, but will also demonstrate deficits across multiple psychiatric symptoms in excess to those reported by normal controls or individuals with the specific impairment (e.g., Booksh, 2005; Harp et al., 2011). For example, in the present study, simulation group participants endorsed moderate levels of depression (M = 13.28, SD = 7.38) and anxiety (M = 10.14, SD = 6.40), which was significantly higher compared to the mild levels of depression (M = 7.68, SD = 5.79) and anxiety (M = 6.03, SD = 5.34) endorsed by honest responder participants. Of note, there was not a significant difference within the honest responder or simulation groups. Furthermore the simulation group endorsed significantly higher ratings on question 9 of the PHQ-9, '*Thoughts that you were better off dead or of hurting yourself,*' compared to the control group.

According to the literature, patients with chronic pain are at increased risk for depression and anxiety (e.g., Bener et al., 2013; Kroenke et al., 2007; Kroenke & Spitzer, 2002; Kroenke, Spitzer, Williams, & Löwe, 2010). Using the recommended cut-point score of >10 (Kroenke et al., 2010), 64.6% of simulators and 29.5% of honest responders obtained a positive screen for depression, and 50% of simulators and 19.1% of honest responders screened positively for anxiety. Although simulators were more likely to endorse higher levels of emotional distress, the

present study does not provide conclusive evidence that measures like the PHQ-9 and GAD-7 should be used in isolation for assessing for drug-seeking or malingered chronic pain. However, very high elevations on both measures may warrant further evaluation from other professionals (e.g., psychologists). Finally, there was no significant difference between college student and chronic pain honest responders. This was consistent with previous findings that rates of depression and anxiety are often similar between chronic pain patients (approximately 23% per Bair, Wu, Damush, Sutherland & Kroenke, 2010) and college students (approximately 4–22%, Eisenberg, Gollust, Golberstein, & Hefner, 2007; Hunt & Eisenberg, 2010).

In conclusion, the findings suggest that individual measures used in isolation would have limited applicability to determining which patients are potentially engaging in drug-seeking behaviors or malingering chronic pain symptoms. Instead, these findings appear consistent with the previous literature which suggests extreme ratings across multiple measures in different areas (e.g., pain intensity, psychological symptoms, substance abuse risk and disability) may be an adequate way for physicians to identify individuals who may benefit from additional evaluation (e.g., such as seeing a pain psychologist) (Larrabee, 2003; Victor, Boone, Serpa, Buehler, & Ziegler, 2009). In neuropsychological literature, the failure of two or more symptom validity measures suggests questionable effort on testing and can result in up to 50% variance in neuropsychological testing performance (Meyers, Volbrecht, Axelrod, & Reinsch-Boothby, 2011). Future research may benefit from evaluating similar algorithms to see if there is a distinct pattern of extreme response styles or failure rates on measures such as the PDQ or MSPQ which suggest questionable chronic pain symptom reporting or high risk for drug-seeking behavior.

Implications

The present findings highlight the complexity of assessing subjective pain symptoms and of using brief self-report measures to identify malingering among pain patients due to false positive/negative rates and screening measures that include no validity scales. Attempts have been made to develop cut-off scores for measures such as the PDI and MSPQ (Bianchini et al., 2014; Crighton et al., 2014), but this study suggests measures designed using populations involved in litigation may not seamlessly translate to a non-litigation context. Likewise, many of the measures used in the present study were designed to assess acute and chronic pain (e.g., PROMIS scales, ODQ, SF-36v2) as opposed to determining genuineness of pain symptoms or detect drug-seeking behaviors. Furthermore, the current self-report measures used in primary care settings lack validity scales. According to Rogers (2008), instruments with embedded validity scales which are intended to assess for over-reporting or inconsistent reporting have been helpful in detecting feigned psychopathology, and therefore, researchers believe that these could be beneficial for assessment of medical pathology (Edmundson, 2014; Tuck et al, 2018). However, the present study demonstrated the high risk of inaccuracy of such measures, and questions how much physicians and other providers can rely on such measures. Such ambitions to develop more effective measures are honorable, but the complexity of the biopsychosocial makeup of pain and the subjective nature of the pain experience makes this a daunting task. Therefore, looking more at endorsement patterns across measures which suggest high risk for malingering and drug-seeking may be more valuable than developing an isolated stand-alone instrument which risks high inaccuracy rates.

Some professionals debate whether malingered chronic pain and drug-seeking behavior is a significant issue in primary care (Rinkus & Knaub, 2008; Williams & Schriver, 2016) and

question the clinical utility of attempting to detect malingered chronic pain symptoms (Tuck et al., 2018). This debate on whether malingered chronic pain is an issue is often overshadowed by the discussion of how to best reduce misuse of opiate-based medications and more effectively treat chronic pain patients without the risk of addiction. Many professionals agree that the misuse of opiate-based medication is an issue, but there is no common agreement on how to best solve this problem (Volkow & McLellan, 2016). Additionally, physician have acknowledged discomfort in assessing for drug-seeking behavior and in treating chronic pain (Jamison et al., 2014). This is why measures like the SOAPP-R may be valuable tools in determining which patients are at risk for abusing opioid medications. In the present study, the SOAPP-R alone was found to be effective in differentiating simulators from honest responders, but it is unclear if the chronic pain patient simulators response styles would translate to the 'real-world' given their anecdotes that individuals engaged in drug-seeking would "endorse everything." Future research is needed to better define and conceptualize what drug-seeking behavior is and what it means for an individual to malinger chronic pain. As efforts are made to better identify patients who may not benefit from opiate-based interventions, research and discussions about how medical providers can best manage these patients is needed. Additional research in these areas are crucial as physicians tackle the 'opioid epidemic.'

Limitations

This study has several potential limitations. First, the chronic pain population was recruited from a pain clinic rather than from a primary care setting. By not recruiting directly from a primary care setting there are limitations to how these findings can be generalized to a primary care setting which may include more varied pain presentations than those captured from a specialty clinic population. However, the reason to recruit from the specialty clinic was due to

the accessibility of the clinic and the clear identification of potential participants for a study on pain patient populations.

Second, although the patients were being seen in a specialty clinic for pain, there was no verification procedure used in the present study to confirm that the person had chronic pain. It is common in the literature to rely on recruiting patients from specialty clinics when conducting chronic pain research (e.g., Crighton et al., 2014), however, there is no gold-standard for verifying the presence of a chronic pain condition which compares to the process of utilizing structured interviews (e.g., Structured Clinical Interview for DSM-IV) to verify symptoms related to specific psychopathology. To assist in clarifying chronic pain conditions, details were collected about the location or source of pain and how long the patient had experienced the pain. However, in the present findings there were approximately 19.1% (n = 19) of chronic pain patients who did not disclose length of chronic pain condition.

Another potential limitation was age and ethnicity differences amongst the participants. There was a significant age difference between the chronic pain patients and the student populations. The current literature (e.g., Dionne et al., 2006; Janevic, McLaughlin, Heapy, Thacker, & Piette, 2017) has demonstrated that older adults are more likely to experience symptoms of pain compared to younger adults. Ideally, this study would have included a sample of healthy adults of comparable age to individuals with chronic pain conditions because this would have allowed for more comparison between normative pain symptoms reported by healthy adults and adults with chronic pain within similar age groups. However, again due to logistical limitations, it was decided to use a college-based sample of convenience for this first step into this unexplored area of research. Additionally, there was a lack of ethnic diversity amongst the chronic pain sample. Previous literature suggests that ethnic differences exist in reporting pain

symptoms (e.g., Nicholl et al., 2015) and that Blacks tend to experience greater levels of pain-related disability compared to their White counterparts (Janevic et al., 2017). However, there is not clear evidence of ethnic differences in terms of malingering.

Another consideration is that some of the measures used in this study have limited psychometric data. The PROMIS measures were created in 2012, but have limited evidence of empirically supported reliability and validity beyond those involved in the scale's creation (Cook et al., 2016; Cella et al., 2010; Rothrock et al., 2010). However, inclusion of this measure was decided based on the increased adoption of its use in primary care settings (Amtmann et al., 2010; Askew et al., 2016; Flynn et al., 2015).

Lastly, a limitation of the present study was the inability to accurately measure the participants' motivation to malinger chronic pain or engage in drug-seeking behavior. Anecdotally, some of the chronic pain patients remarked that they were filling the forms out as they assumed "those drug addicts do." Comments such as these call into question whether the way they responded in the present study is how they would really present if attempting to obtain opiate-based medications, but it does suggest that participants in the simulation group understood the task presented to them. According to the present literature, monetary rewards offered to the simulation group have been found to help motivation, though effects sizes have been small (Elhai et al., 2007; Rogers & Cruise, 1998). In particular, Erdal (2004) demonstrated that monetary rewards resulted in individuals engaging in more flagrant malingering. Overall, the present study did not directly assess nor control for level of motivation, so the effect on the present results is unknown.

Despite the limitations of the present study, the findings provide some insight into the potential utility of commonly used, brief, symptom-focused self-report measures for assessing

malingered chronic pain symptoms. The extant literature in this area is extremely limited and often directed at the medico-legal field, but suggests that assessment of pain symptoms is a challenging process for primary care providers who often feel unprepared to adequately assess and treat chronic pain (Jamison et al., 2014). This study was able to demonstrate that individuals asked to purposefully engage in drug-seeking behaviors may endorse more intense levels of pain and disability, endorse a variety of symptoms (physical and psychological) in an indiscriminant manner at higher levels of severity, and endorse more risk factors for substance abuse compared to those responding honestly.

This study provides several ideas for further research including exploration of the connection between drug-seeking behaviors, malingered chronic pain and prescription practices of providers. This study was formulated based on previous research assessing the effectiveness of self-report measures to distinguish between credible and non-credible symptom reporting. It would be interesting to repeat the study and diversify the pain patient population based on ethnicity, gender, and location (e.g., rural vs. urban) and replace the student population with healthy controls of comparable age to the chronic pain subjects to further assess demographic factors which may impact response patterns. Furthermore, research with individuals who have successfully engaged in malingering or drug-seeking behaviors to obtain medication is needed to better understand the motivation and etiology of these behaviors. By understanding drug-seeking behavior, researchers can better improve methods of detecting such behaviors. Such research may also allow for the study of trends in prescription practices (by looking at what behaviors are successful in obtaining opiate-based medications). Improvements to current and development of new evaluation techniques or measures used by physicians may greatly enhance their ability to reduce the over-prescription of opiate-based medications, thus reducing the risk of misuse/abuse

of opioids. As the field of medicine continues to look for ways to improve pain management and the solution for the ‘opioid epidemic,’ this area of developing strategies to collect information about self-reported pain symptoms and assess for drug-seeking behaviors will continue to be important in the future as physicians continue to work toward reducing opiate abuse/misuse.

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Appendix A

Instructions Prior to Filling Out Tests for Malingering Participants

Task:

Imagine that you have been in an accident and suffered an injury to your neck, shoulder and back. Initially you experienced long-lasting pain but now that you are mostly healed, you have hardly any pain, and you are experiencing no further significant problems due to the injury. However, you were previously prescribed prescription pain medication and you would like to continue to have the medication even though you no longer have any pain. In order to get pain medications, you need to convincingly act like a person who has pain. Your task today is to complete the following questionnaires as if you were experiencing severe, persistent, pain in order to obtain narcotic pain medications (e.g., Percocet, Oxycodone, OxyContin, Norco).

Directions:

Imagine yourself as the person in the above scenario and try to fill out the following questionnaires and complete the following task convincingly acting like someone who is trying to obtain prescription pain medications by presenting with chronic pain symptoms.

Tell your researcher a summary of what you understand you are supposed to do for this part of the study.

Appendix B

Instructions Prior to Filling Out Tests for Honest Responder Participants

Directions:

Please fill out the following questionnaires honestly.

Tell your researcher a summary of what you understand you are supposed to do for this part of the study.

Appendix C

Demographic Questionnaire

1. Age:_____

2. Sex (Check one): ☐ Male ☐ Female

3. Ethnicity/Race:

   ☐ Caucasian/White (Non-Hispanic) ☐ African American ☐ Hispanic/Latino
   ☐ Native American ☐ Asian/Pacific Islander ☐ Middle Eastern
   ☐ Multiracial ☐ Other

4. Years of Education:

   ☐ No High School Diploma ☐ Bachelor's degree
   ☐ High School Diploma/GED ☐ Some Graduate School, but no degree
   ☐ Some College, no Bachelor's ☐ Master's/Doctoral Degree

5. Do you have a chronic pain condition: ☐ Yes ☐ No

   a. If Yes, how long have you had this condition: _____months _____ years

   b. What is the source of your pain:

      ☐ Low back ☐ Neck/Shoulder
      ☐ Arthritis/osteoarthritis ☐ Headaches/Migraines
      ☐ Multiple sclerosis ☐ Fibromyalgia
      ☐ Nerve damage (neuropathy) ☐ Other (please specify):_____

6. Have you ever been prescribed narcotics (e.g., Hydrocodone, Oxycodone, OxyContin, Morphine, or Norco) to treat a chronic pain condition: ☐ Yes ☐ No

7. What additional methods have you used to manage previous/current pain:

   ☐ Tylenol, Ibuprofen, or Aleve ☐ Acupuncture
   ☐ Exercise (e.g., Yoga) ☐ Chiropractic Manipulation
   ☐ Supplements/Vitamins ☐ Other (please specify):_____

Appendix D

PROMIS- Pain Behavior Measure

PROMIS-PB-SF7

Please respond to the following items by marking one circle per row

In the past 7 days…	**Had No Pain**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
1. When I was in pain I became irritable	O	O	O	O	O	O
2. When I was in pain I grimaced	O	O	O	O	O	O
3. When I was in pain I moved very slowly	O	O	O	O	O	O
4. When I was in pain I moved stiffly	O	O	O	O	O	O
5. When I was in pain I called out for someone to help me	O	O	O	O	O	O
6. When I was in pain I isolated myself from others	O	O	O	O	O	O
7. When I was in pain I thrashed	O	O	O	O	O	O

Appendix E

PROMIS-Pain Inference Measure

PROMIS-PI-SF6

Please respond to the following items by marking one circle per row

In the past 7 days…	**Not at all**	**A little bit**	**Somewhat**	**Quite a bit**	**Very Much**
1. How much did pain interfere with your enjoyment of life?	O	O	O	O	O
2. How much did pain interfere with your ability to concentrate?	O	O	O	O	O
3. How much did pain interfere with your day to day activities?	O	O	O	O	O
4. How much did pain interfere with your enjoyment of recreational activities?	O	O	O	O	O
5. How much did pain interfere with doing tasks away from home (e.g., getting groceries, running errands)?	O	O	O	O	O

In the past 7 days…	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
6. How much did pain keep you from socializing with others?	O	O	O	O	O

Appendix F

PROMIS-Pain Intensity Measure

PROMIS-PI-SF3

Please respond to the following items by marking one circle per row

In the past 7 days…	**Had no Pain**	**Mild**	**Moderate**	**Severe**	**Very Severe**
1. How intense was your pain at its worst?	O	O	O	O	O
2. How intense was your average pain?	O	O	O	O	O
	No Pain	**Mild**	**Moderate**	**Severe**	**Very Severe**
3. What is your level of pain right now?	O	O	O	O	O

Appendix G

Oswestery Disability Questionnaire

OLB-PDQ-10

This questionnaire has been designed to give us information as to how your back or leg pain is affecting your ability to manage in everyday life. Please answer by checking one box in each section for the statement which best applies to you. We realize you may consider that two or more statements in any one section apply but please just shade out the spot that indicates the statement which most clearly describes your problem.

Section 1 – Pain Intensity

- ❑ I have no pain at the moment.
- ❑ The pain is very mild at the moment.
- ❑ The pain is moderate at the moment.
- ❑ The pain is fairly severe at the moment.
- ❑ The pain is very severe at the moment.
- ❑ The pain is the worst imaginable at the moment.

Section 2 – Personal Care (washing, dressing, etc.)

- ❑ I can look after myself normally but it is very painful.
- ❑ It is painful to look after myself and I am slow and careful.
- ❑ I need some help but manage most of my personal care.
- ❑ I need help every day in most aspects of my personal care.
- ❑ I need help every day in most aspects of my self-care.
- ❑ I do not get dressed, wash with difficulty, and stay in bed.

Section 3 - Lifting

- ❑ I can lift heavy weights without extra pain.
- ❑ I can lift heavy weights but it gives extra pain.
- ❑ Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned (i.e. on a table).
- ❑ Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.
- ❑ I can lift only very light weights.
- ❑ I cannot lift or carry anything at all.

Section 4 – Walking

- ❑ Pain does not prevent me walking any distance.
- ❑ Pain prevents me walking more than 1mile.
- ❑ Pain prevents me walking more than ¼ of a mile.
- ❑ Pain prevents me walking more than 100 yards.
- ❑ I can only walk using a stick or crutches.
- ❑ I am in bed most of the time and have to crawl to the toilet.

Section 5 – Sitting

- ❑ I can sit in any chair as long as I like.
- ❑ I can sit in my favorite chair as long as I like.
- ❑ Pain prevents me from sitting for more than 1 hour.
- ❑ Pain prevents me from sitting for more than ½ hour.
- ❑ Pain prevents me from sitting for more than 10 minutes.
- ❑ Pain prevents me from sitting at all.

Section 6 – Standing

- ❑ I can stand as long as I want without extra pain.
- ❑ I can stand as long as I want but it gives me extra pain.
- ❑ Pain prevents me from standing more than 1 hour.
- ❑ Pain prevents me from standing for more than ½ an hour.
- ❑ Pain prevents me from standing for more than 10 minutes.
- ❑ Pain prevents me from standing at all.

Section 7 – Sleeping

- ❑ My sleep is never disturbed by pain.
- ❑ My sleep is occasionally disturbed by pain.
- ❑ Because of pain, I have less than 6 hours sleep.
- ❑ Because of pain, I have less than 4 hours sleep.
- ❑ Because of pain, I have less than 2 hours sleep.
- ❑ Pain prevents me from sleeping at all.

Section 8 – Sex life (if applicable)

- ❑ My sex life is normal and causes no extra pain.
- ❑ My sex life is normal but causes some extra pain.
- ❑ My sex life is nearly normal but is very painful.
- ❑ My sex life is severely restricted by pain.
- ❑ My sex life is nearly absent because of pain.
- ❑ Pain prevents any sex life at all.

Section 9 – Social Life

- ❑ My social life is normal and causes me no extra pain.
- ❑ My social life is normal but increases the degree of pain.
- ❑ Pain has no significant effect on my social life apart from limiting my more energetic interests, i.e. sports.
- ❑ Pain has restricted my social life and I do not go out as often.
- ❑ Pain has restricted social life to my home.
- ❑ I have no social life because of pain.

Section 10 – Traveling

- ❑ I can travel anywhere without pain.
- ❑ I can travel anywhere but it gives extra pain.
- ❑ Pain is bad but I manage journeys of over two hours.
- ❑ Pain restricts me to short necessary journeys under 30 minutes.
- ❑ Pain prevents me from traveling except to receive treatment.

Appendix H

Short Form 36-Item Health Survey Version 2

SF-36V2

Choose one option for each questionnaire item.

1. In general, would you say your health is:
   1- Excellent
   2- Very Good
   3- Good
   4- Fair
   5- Poor

2. **Compared to one year ago**, how would you rate your health in general **now**?
   1- Much better than one year ago
   2- Somewhat better than one year ago
   3- About the same
   4- Somewhat worse than one year ago
   5- Much worse than one year ago

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. **Vigorous activities**, such as running lifting heavy objects, participating in strenuous sports	O	O	O
4. **Moderate activities**, such as moving table, pushing a vacuum cleaner, bowling or playing golf	O	O	O
5. Lifting or carrying groceries	O	O	O
6. Climbing several flights of stairs	O	O	O
7. Climbing one flight of stairs	O	O	O
8. Bending, kneeling, or stooping	O	O	O
9. Walking more than one mile	O	O	O
10. Walking several blocks	O	O	O
11. Walking one block	O	O	O
12. Bathing or dressing yourself	O	O	O

During the past four weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	Yes	No
13. Cut down on the amount of time you spent on work or other activities	O	O
14. Accomplished less than you would like	O	O
15. Were limited in the kind of work or other activities	O	O
16. Had difficulty performing the work or other activities (for example, it took extra effort)	O	O

During the past four weeks, have you had any of the following problems with your work or other regular activities as a result of emotional problems (such as feeling depressed or anxious)?

	Yes	No
17. Cut down on the amount of time you spent on work or other activities	O	O
18. Accomplished less than you would like	O	O
19. Didn't do work or other activities as carefully as usual	O	O

20. During the past four weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?
    1- Not at all
    2- Slightly
    3- Moderately
    4- Quite a bit
    5- Extremely

21. How much bodily pain have you had during the past 4 weeks?
    1- None
    2- Very mild
    3- Mild
    4- Moderate
    5- Severe
    6- Very Severe

22. During the past four weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?
    1- Not at all
    2- A little bit
    3- Moderately
    4- Quite a bit
    5- Extremely

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the past 4 weeks...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
23. Did you feel full of pep?	O	O	O	O	O	O
24. Have you been a very nervous person?	O	O	O	O	O	O
25. Have you felt so down in the dumps that nothing could cheer you up?	O	O	O	O	O	O
26. Have you felt calm and peaceful?	O	O	O	O	O	O
27. Did you have a lot of energy?	O	O	O	O	O	O
28. Have you felt downhearted and blue?	O	O	O	O	O	O
29. Did you feel worn out?	O	O	O	O	O	O
30. Have you been a happy person?	O	O	O	O	O	O
31. Did you feel tired?	O	O	O	O	O	O

32. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?
    1- All of the time
    2- Most of the time
    3- Some of the time
    4- A little of the time
    5- None of the time

How TRUE or FALSE is each of the following statements for you.

	Definitely True	Mostly True	Don't know	Mostly False	Definitely False
33. I seem to get sick a little easier than other people	O	O	O	O	O
34. I am as healthy as anybody I know	O	O	O	O	O
35. I expect my health to get worse	O	O	O	O	O
36. My heath is excellent	O	O	O	O	O

Appendix I

Pain Disability Index

PDI

The rating scales below are designed to measure the degree to which aspects of your life are disrupted by chronic pain. In other words, we would like to know how much pain is preventing you from doing what you would normally do or from doing it as well as you normally would. Respond to each category indicating the overall impact of pain in your life, not just when pain is at its worst.

For each of the 7 categories of life activity listed, please circle the number on the scale that describes the level of disability you typically experience. A score of 0 means no disability at all, and a score of 10 signifies that all of the activities in which you would normally be involved have been totally disrupted or prevented by your pain.

Family/Home Responsibilities: This category refers to activities of the home or family. It includes chores or duties performed around the house (e.g. yard work) and errands or favors for other family members (e.g. driving the children to school).

No Disability 0__. 1__. 2__. 3__. 4__. 5__. 6__. 7 __. 8__. 9__. 10__. Worst Disability

Recreation: This disability includes hobbies, sports, and other similar leisure time activities.

No Disability 0__. 1__. 2__. 3__. 4__. 5__. 6__. 7 __. 8__. 9__. 10__. Worst Disability

Social Activity: This category refers to activities, which involve participation with friends and acquaintances other than family members. It includes parties, theater, concerts, dining out, and other social functions.

No Disability 0__. 1__. 2__. 3__. 4__. 5__. 6__. 7 __. 8__. 9__. 10__. Worst Disability

Occupation: This category refers to activities that are part of or directly related to one's job. This includes non-paying jobs as well, such as that of a housewife or volunteer.

No Disability 0__. 1__. 2__. 3__. 4__. 5__. 6__. 7 __. 8__. 9__. 10__. Worst Disability

Sexual Behavior: This category refers to the frequency and quality of one's sex life.

No Disability 0__. 1__. 2__. 3__. 4__. 5__. 6__. 7 __. 8__. 9__. 10__. Worst Disability

Self Care: This category includes activities, which involve personal maintenance and independent daily living (e.g. taking a shower, driving, getting dressed, etc.)

No Disability 0__. 1__. 2__. 3__. 4__. 5__. 6__. 7 __. 8__. 9__. 10__. Worst Disability

Life-Support Activities: This category refers to basic life supporting behaviors such as eating, sleeping and breathing.

No Disability 0__. 1__. 2__. 3__. 4__. 5__. 6__. 7 __. 8__. 9__. 10__. Worst Disability

Appendix J

Modified Somatic Perception Questionnaire

MSPQ

Please describe how you have felt during the PAST WEEK by marking a check mark (✓) in the appropriate box. Please answer all questions. Do not think too long before answering.

	Not at all	A little, slightly	A great deal, quite a bit	Extremely, could not have been worse
Heart rate increase				
Feeling hot all over				
Sweating all over				
Sweating in a particular part of the body				
Pulse in neck				
Pounding in head				
Dizziness				
Blurring of vision				
Feeling faint				
Everything appearing unreal				
Nausea				
Butterflies in stomach				
Pain or ache in stomach				
Stomach churning				
Desire to pass water				
Mouth becoming dry				
Difficulty swallowing				
Muscles in neck aching				
Legs feeling weak				
Muscles twitching or jumping				
Tense feeling across forehead				
Tense feeling in jaw muscles				

Appendix K

Screener and Opioid Assessment for Patients with Pain-Revised

SOAPP-R

The following are some questions given to patients who are on or being considered for medication for their pain. Please answer each question as honestly as possible. There are no right or wrong answers.

	Never	Seldom	Sometimes	Often	Very Often
1. How often do you have mood swings?	O	O	O	O	O
2. How often have you felt a need for higher doses of medications to treat your pain?	O	O	O	O	O
3. How often have you felt impatient with your doctors?	O	O	O	O	O
4. How often have you felt that things are just too overwhelming that you can't handle them?	O	O	O	O	O
5. How often is there tension in the home?	O	O	O	O	O
6. How often have you counted pills to see how many are remaining?	O	O	O	O	O
7. How often have you been concerned that people judge you for taking pain medication?	O	O	O	O	O
8. How often do you feel bored?	O	O	O	O	O
9. How often have you taken more pain medication than you were suppose to?	O	O	O	O	O
10. How often have you worried about being left alone?	O	O	O	O	O
11. How often have you felt a craving for medication?	O	O	O	O	O
12. How often have others expressed concern over your use of medication?	O	O	O	O	O

Appendix L

Patient Health Questionnaire- Nine Item

PHQ-9

Over the PAST TWO WEEKS, how often have you been bothered by the following problems?

	Not at all	Several Days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	O	O	O	O
2. Feeling down, depressed, or hopeless	O	O	O	O
3. Trouble falling or staying asleep, or sleeping too much	O	O	O	O
4. Feeling tired or having little energy	O	O	O	O
5. Poor appetite or overeating	O	O	O	O
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down.	O	O	O	O
7. Trouble concentrating on things, such as reading the newspaper or watching TV	O	O	O	O
8. Moving or speaking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around more than usual	O	O	O	O
9. Thoughts that you were better off dead or of hurting yourself in some way	O	O	O	O