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Evaluation Of Substance Abuse Measures In Identifying Drug Seeking Behavior

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EVALUATION OF SUBSTANCE ABUSE MEASURES IN IDENTIFYING DRUG SEEKING BEHAVIOR

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ABSTRACT

The opioid crisis consuming the U.S. has resulted in approximately 115 daily deaths that may be partially due to prescribing practices of opioid-based medications. Screeners used to assess for opioid abuse are often dichotomous, face-valid, and allow individuals to easily hide their substance abuse. The current study examined if brief screeners can be used to detect opioid abuse that is intentionally hidden, and proposed that modifying dichotomous response sets to Likert-scales will increase variability in responses, resulting in better detection of hidden substance abuse. It was hypothesized that individuals instructed to malinger will have lower scores on the original and Likert-scale versions as compared to honest responders. Additionally, it was hypothesized that Likert-scale versions will demonstrate greater internal consistency among both malingerers and honest responders as compared to dichotomous versions, and Likert-scale versions will demonstrate better prediction of group membership as compared to the original dichotomous versions of the measures. Finally, it was hypothesized that the SASSI-4 will be the best measure at predicting group membership. Participants were 226 undergraduate students and an online substance abuse population. Participants were asked to complete screeners examining substance abuse and demographic information. Results indicated that individuals instructed to malinger had lower scores on all measures compared to honest responders, some Likert-scale versions demonstrated greater internal consistency, the DAST and ORT were the best predictors, and the SASSI-4 was one of the worst measures compared to all screeners. Overall, results provide support to further explore the utility of brief screeners in detecting hidden substance abuse.

CHAPTER 1

INTRODUCTION

Opioid abuse is a significant problem in the United States. In 2005, annual substance abuse treatment admissions primarily for opioid abuse increased to 254,000, a notable increase from the 228,000 admissions in 1995, and encompassed between 14-15% of all substance abuse treatment admissions during this time (Stine & Krosten, 2013). In 2006, over 2.1 million teenagers abused prescription drugs, which included 33% of teenagers between the ages of 12 and 17 that were considered to be new prescription drug users (Stine & Krosten, 2013). The ever-increasing estimates regarding the prevalence of opioid use is associated with increased mortality rates that have risen over the last two decades. According to the Centers for Disease Control and Prevention (CDC; 2017), between 1999 and 2016 630,000 people died from a drug overdose. Of the 63,600 overdose deaths in 2016, 66% were caused by opioid consumption. Overdose deaths by opioid intake are nearly 5 times higher today than in 1999, with a current estimation of 115 Americans dying daily due to opioid use (CDC, 2017).

Loss of life is not the only notable problem resulting from the opioid epidemic. In 2016, overall societal economic burden from opioid use that included criminal justice, workplace, and healthcare costs was approximately $78.5 billion (Leslie et al., 2019). Many have speculated about the origin of the current opioid crisis, and most identify overprescribing opioids in health care settings as one of many etiological factors for the current epidemic. For example, Peavey and colleagues (2012) explored the prevalence of dependence to prescription-based opioids prior to heroin use, and found 39% of the 433 participants who were heroin injectors reported

dependency to prescription opioids before transitioning to heroin. Others have noted birth cohort effects as an indicator of prescription opioid misuse. For example, Martins, Keyes et al. (2010) reported that individuals born between 1944-1963 showed a 56% to 60% increase in nonmedical prescription opioid use. Thus, accessibility of opioids, both prescription and illicit based, has become particularly problematic in relation to the current opioid epidemic in the United States (Blagen, 2015; Sharma et al., 2016).

The concern surrounding the opioid epidemic has led researchers to identify how individuals are obtaining opioids, including opioid-based medications, as some have argued that overprescribing opioid-based medications is one of many factors that influenced the current opioid crisis. Currently, opioid-based pain medications are the most commonly prescribed group of medications in the United States (Sarzi-Puttini et al., 2012) with roughly half of opioid-based prescriptions coming from primary care providers (PCPs; Dowell et al., 2016). Researchers have stated that opioid-based medications are illegally distributed or improperly consumed, and rates of opioid-related addiction and overdose deaths continue to rise (Volkow & McLellan, 2016). One possible challenge for PCPs is distinguishing between individuals who misreport or hide substance use from those with a genuine need for opioid-based medication. According to Jamison and colleagues (2014) nearly half of participating physicians reported they did not receive specific training focused on appropriate practices for prescribing opioid medications. Additionally, research suggests that PCPs do not feel confident exploring issues of substance abuse with patients, nor do they have the expertise to detect drug seeking behavior, substance abuse, or the early stages of addictive behavior (Anderson et al., 2013; Bhamb et al., 2006; Dougherty, 2012; Manjiani et al., 2014; Volkow & McLellan, 2016). Thus, further understanding

of malingering and drug-seeking behavior is warranted along with effective screeners to identify those at risk of abusing opioids and opioid-based medications.

Although different, malingering and drug-seeking behavior share distinct commonalities when describing behavioral characteristics of those at risk of abusing opioids and opioid-based medications. Malingering is defined by the *Diagnostic and Statistical Manual of Mental Disorders, 5th edition* (DSM-5) as the "intentional production or grossly exaggerated physical or psychological symptoms, motivated by external incentives such as obtaining drugs" (American Psychiatric Association, APA, 2013, p. 726). This behavioral pattern may be strongly suspected in a variety of areas including medicolegal contexts and when claimed stress is discrepant from objective findings and observations (APA, 2013). Drug-seeking behavior, by comparison, has historically been used as a descriptor without clear criteria, and often defines behavior that accentuates acquiring medications because of an active substance abuse problem, to give to family and friends, or to sell illegally (McCaffery et al., 2005). Regardless of whether the behavior is identified as malingering or drug-seeking, health care professionals are tasked with identifying these types of behaviors to prevent misdiagnosis and inappropriately prescribing opioid-based medications to certain patients. To combat this type of behavior, health care professionals might utilize screening instruments to assess substance abuse risk, but current research has yet to provide evidence for the efficacy of these measures (Reuben et al., 2015).

Currently, there is a dearth of research on utilizing brief drug screeners for the purpose of identifying malingering/drug-seeking behavior. Only one study by Wooley and colleagues (2013) examined the effectiveness of substance use measures in detecting denial of drug use; results indicated that denial was often undetected by the measures evaluated in the study. Although most screeners were designed to quickly and accurately identify drug use problems

from those honestly responding to questions, it is worth exploring if these same screeners can be used to detect malingering/drug-seeking behavior. One of the potential drawbacks of using these screeners is that most involve dichotomous, face-valid items that enable individuals who intend to hide their substance abuse to easily produce the desired result. As a result, it is proposed that modifying response sets of the original versions of screeners to Likert-scales will increase variability in responses, resulting in greater difficulty for individuals to deceive the screeners and a better ability to detect meaningful differences between those with substance abuse histories and those attempting to hide substance abuse problems. Overall, determining whether substance abuse screeners can be used to detect malingering/drug-seeking behavior would provide health care providers additional tools needed to combat prescription-opioid abuse and misuse. Thus, the purpose of the current study is to identify if commonly used screeners can be used to detect opioid abuse that is intentionally hidden from health care providers. It is the hope that findings from this study will provide vital information needed to begin developing screeners that detect malingering/drug-seeking behavior and misreporting substance use in health care settings.

CHAPTER 2

LITERATURE REVIEW

Opioid Epidemic

Identification of those at risk of abusing opioids has been a central theme in the battle against the opioid use epidemic. The opioid use epidemic has been connected to the growing need to treat pain in health care settings with prescription opioids (Kennedy-Hendricks et al., 2016), and presents a daunting task for health care providers to deliver adequate treatment for pain while acknowledging concerns of addiction possibilities in some patients (Mendelson et al., 2008). Along with opioid-based pain medication, illicit opioid use, such as heroin consumption, has increasingly become a national concern. Other forms of opioid-based medications, such as buprenorphine and methadone maintenance, have been used to curb the opioid crisis and are generally prescribed to those identified as having an addiction problem. However, these medically assisted treatments designed to treat opioid dependence can also be abused (Roche et al., 2008; Wu et al., 2008). Overall, the use of prescription opioids, illicit opioids, and opioid-based addiction medications comprise the current opioid use crisis observed in the United States.

Prescription Opioids

The prevalence of prescription opioid abuse has been drastically increasing since the turn of the 21st century. For example, from 1999 to 2011, consumption of oxycodone increased by almost 500%, and more than doubled for hydrocodone, leading to a quadrupled overdose death rate over the same period (Barry, 2018; Kolodny, et al., 2015; Sharma et al., 2016). Additionally, a distinct increase in emergency room visits for nonmedical prescription-based opioid use occurred along with an approximate 900% increase in individuals pursuing addiction treatment

for prescription-based opioids from 1997 to 2011 (Kolodny et al., 2015). The increase in prescribing opioid medications has also been linked to heroin consumption. Specifically, the National Survey on Drug Use and Health (NSDUH) indicated that four out of five heroin users first used prescription opioids before transitioning to heroin, whereas other studies noted that approximately 39% of individuals used prescription-based opioid medications before transitioning to heroin (Kolodny et al., 2015; Peavey et al., 2012). This may be due to heroin becoming increasingly cheaper and used more frequently compared to prescription opioids (Kolodny et al., 2015; Sharma et al., 2016).

There was a 19% reduction in opioid prescriptions from 2006 to 2017; however, there were still more than 191 million opioid prescriptions provided to American patients in 2017 (Center for Disease Control and Prevention, 2017). This reduction in prescribing opioids to patients included an overall decline in dose strength of opioid prescriptions since 2008, suggesting healthcare providers are becoming more cautious in their prescription practices. Still, 2016 reports indicated approximately 11.5 million Americans endorsed misusing prescription-based opioids in the past year. Methadone, oxycodone, and hydrocodone are considered the most common drugs involved in prescription overdose deaths, and were associated with between 70,637 and 175,949 national visits to emergency departments in 2009 (Kolodny et al., 2015). These statistics provide a glimpse of the current opioid epidemic problem, as illicit opioid use and diverted opioid-based medications designed to treat opioid addiction are prevalent as well.

Illicit Opioids

Between the mid-1990s and early 2000s, over 100,000 individuals between the ages of 12 and 25 experimented with heroin (Fellers, 2016). Additionally, approximately 228,000 individuals sought substance abuse treatment for heroin addiction in 1995 (Fellers, 2016).

Estimates of heroin use almost doubled between 2002-2005 and 2009-2011 for individuals between 18 and 25 (Martins, Segura, et al., 2017). Between 2000 and 2009, approximately 3.5 million people used heroin, including 1 million people who became addicted (Stine & Krosten, 2013). The accessibility and purity of heroin have also increased tremendously, with some estimates above 60% purity, which enhances its addictive qualities (Sharma et al., 2016). In addition to the increased purity of heroin, the opioid agonist fentanyl, designed to treat severe pain, has been illicitly made and often mixed with heroin, leading to a sharp increase in overdoses (Barry, 2018; CDC, 2017). The increased use of illicit opioids produced an increase in emergency room visits in 2009, with 213,118 visits due to heroin use (National Institute on Drug Abuse, 2015). Heroin-related overdose deaths increased by five times between 2010 and 2016 that includes over 15,469 deaths in 2016 (CDC, 2017).

The Probable Cause of Increased Opioid Consumption

Although the true cause of the opioid epidemic remains heavily debated, researchers have indicated the overprescribing practices of opioid-based medications as one factor that led to a distinct increase in the prevalence of opioid addiction, and subsequent rise in overdose deaths and heroin use (Blagen, 2015; Kanouse & Compton, 2015; Kennedy-Hendricks et al., 2016; Kolodny et al., 2015; Sharma et al., 2016; Van Zee, 2009; Vashishtha et al., 2017). According to Kolodny et al. (2015), the origin of the current crisis began between the late-80s and mid-90s. In 1986, a widely cited paper suggesting that prescription opioids could be used safely and on a long-term basis for non-cancer-related pain sparked a gradual increase in opioid prescriptions throughout the late-80s. In 1992, guidelines from the Agency for Healthcare Quality Research asserted addiction concerns regarding opioids for pain treatment were unfounded and almost half of patients were not receiving acceptable postsurgical analgesia (Kanouse & Compton, 2015).

A significant increase in opioid use accelerated rapidly soon after the introduction of OxyContin in 1995 (Kolodny et al., 2015; Van Zee, 2009). This medication was marketed aggressively by pharmaceutical companies, subsequently leading to OxyContin being the most abused drug in the United States by 2004 (Kolodny, et al., 2015; Van Zee, 2009). Additionally, in 1995 the American Pain Society advocated that pain be considered as a "fifth vital sign," as there were concerns that pain was not being treated effectively and the treatment for chronic pain was believed to be varied and limited (Kanouse & Compton, 2015). This sentiment was echoed by the American Academy of Pain Medicine in 1998 who also advocated for the use of opioids for pain management (Kanouse & Compton, 2015).

Prior to the introduction of OxyContin and emphasis on the importance of treating pain, numerous physicians were reluctant to prescribe prescription opioids on a long-term basis for common chronic conditions, citing concerns about physiological dependence, tolerance, and addiction (Kolodny et al., 2015). To subdue these concerns, Purdue Pharma provided approximately 20,000 educational programs on pain treatment between 1996 and 2002, and through this programming provided massive influence on physician prescribing practices throughout the United States (Kolodny et al., 2015; Van Zee, 2009). Purdue Pharma also provided financial support to a number of pain-related organizations including the American Pain Society and the American Academy of Pain Medicine, who in turn promoted identification and treatment of pain and use of prescription opioids (Kolodny et al., 2015). Physician-spokespersons for opioid manufacturers minimized the addictive qualities of opioid medications by producing papers and providing lectures claiming addiction is rare and distinctly different from physical dependence (Kennedy-Hendricks et al., 2016; Kolodny et al., 2015; Van Zee, 2009). Marketing also included unsubstantiated claims of the benefits of long-term opioid use,

since long-term clinical trials establishing the efficacy and safety of opioid medications for chronic non-cancer pain were never conducted (Kolodny et al., 2015).

Although the origin of the opioid epidemic is unclear, the campaign efforts of Purdue Pharma and other pharmaceutical companies arguably influenced prescriber practices of opioid-based pain medications (Kolodny et al., 2015). Currently, opioid-based pain medications are the most commonly prescribed group of medications in the United States (Sarzi-Puttini et al., 2012), with roughly half of opioid-based prescriptions coming from primary care providers (PCPs; Dowell et al., 2016). This may be due, in part, to the major changes in prescription practices that occurred in the 1990s as PCPs began prescribing more opioids than ever before, possibly without adequate training (Kanouse & Compton, 2015). For example, a 2000 study found that 56% of medical residency programs surveyed required training in substance abuse, and those that reported this indicated the training was minimal at best (as cited in Kanouse & Compton, 2015). Additionally, Jamison et al., (2014) found that approximately 46% of PCPs reported they lacked training in prescribing opioids. These studies highlight the concern that PCPs lack proper training to effectively identify and distinguish those who need opioid-based pain medications from those who may be intentionally malingering symptomology to obtain medications for nonmedical purposes. Overall, there is a growing need for PCPs to be accurate when prescribing opioid-based pain medications. Without adequate training or measures to assist in accurate diagnosis, it appears opioid prescribing practices of PCPs will continue to hinder the efforts of curbing the opioid epidemic.

Diversion of Opioid-Based Medications

In response to the ongoing opioid epidemic, medically-assisted treatment was developed and implemented throughout the United States, and includes the use of methadone and

buprenorphine as commonly used methods for the treatment of opioid use disorders and chronic pain (Trescot et al., 2015; Vashishtha et al., 2017). Methadone, a μ-opioid receptor agonist, and buprenorphine, a μ-opioid receptor partial agonist, are both physician prescribed and FDA approved, and are often used in conjunction with psychosocial and psychotherapeutic treatment (Brezing & Bisaga, 2015; Connery, 2015; Getz, 2014; Greenwald et al., 2014; Hser et al., 2015; Mendelson et al., 2008; Miller et al., 2011; Rosenblum, 2008). Although the use of methadone and buprenorphine produce positive results in treating opioid addiction, a number of researchers are concerned with the abuse potential and diversion efforts for these medications (Duffy & Mackridge, 2014; Furst, 2014; Johnson & Richert, 2015a; Johnson & Richert, 2015b; Roche et al., 2008; Wu et al., 2008).

One of the main concerns regarding opioid-based addiction medication is the diversion of the substances for extrinsic gain. For example, Furst (2014) highlighted this problem and indicated that one reason to divert buprenorphine was to illicitly sell the substance, promoting further misuse by drug abusers and recreational users. Furst (2014) also noted that overprescribing practices and lack of action to mitigate misuse and diversion in drug treatment settings bolsters the proliferation of illicitly used buprenorphine. Similarly, Johnson and Richert (2015b) stated that patients receiving opioid-based addiction medication consider diversion of buprenorphine and methadone as mostly positive (83.7%), morally right (76.8%) and without any significant risk of detection (66.9%). They also noted in a separate study that individuals who divert methadone and buprenorphine are a small, heterogeneous group and continued illicit drug use remains a common risk factor for this type of behavior (Johnson & Richert, 2015a).

Concerns regarding illicitly used and diverted methadone has been the topic of research over the last 10 years. Duffy and Mackridge (2014) reported that 60% of participants illicitly

obtained methadone after failing to pick up their methadone prescription. Twelve percent of the participants in the study reported using diverted methadone when not in treatment, along with 14% who reported providing their prescription to others in order to help with opioid withdrawal. Researchers indicated that helping others was a motivation to divert methadone (80%) more so than making money to buy other drugs (25%; Duffy & Mackridge, 2014). Also noted was the continued use of other illicit-based substances in conjunction with methadone treatment, which presents as an additional concern for individuals receiving this type of care. Illicit methadone use has also been observed in 1.6% of 383 participants recruited from six community-based methadone clinics and included 4.7% who reported a history of regular use (Wu et al., 2008). Although research participants report primarily altruistic motivations for diverting methadone, it remains a significant concern when opioid abuse is treated with medically assisted programming.

Similar to Wu et al. (2008), Roche et al. (2008) reported that 73% of 81 participants endorsed illicit methadone use before medically assisted treatment began, and 55% reported continued illicit use during treatment, stating illicit methadone was available at a low cost. Duffy and Mackridge (2014), Furst (2014), Johnson and Richert (2015a), Roche et al., (2008), and Wu et al. (2008), highlight a growing concern among health care professionals that methadone and buprenorphine treatment for opioid abuse are frequently diverted for external gain. Even though methadone and buprenorphine are heavily regulated, use of these medications present a common concern similar to prescription opioid-based pain medication and illicit heroin use. Thus, it appears prudent to identify resources health care professionals can use to detect opioid abuse when prescription opioids are considered for any form of treatment.

Malingering and Drug Seeking Behavior

Considering the proliferation of opioid abuse and the desire to obtain opioid-based substances, identifying individuals at risk of opioid abuse and addiction is paramount in medical settings. Indeed, many individuals struggling from opioid abuse may desire to hide or deny their use from healthcare professionals for a variety of reasons, including the stigma associated with addiction or for other external gains. This effort to intentionally hide or deny opioid abuse presents added difficulties for healthcare professionals and may manifest in malingering a variety of ailments, including pain, to obtain opioid-based medications. Thus, it is important to understand the ways in which opioid abusers attempt to obtain opioid-based medication and drug-seeking behavior that may coincide with this problematic endeavor.

Malingering is defined by the DSM-5 as the "intentional production or grossly exaggerated physical or psychological symptoms, motivated by external incentives such as obtaining drugs" (APA, 2013, p. 726), This behavioral pattern may be strongly suspected in a variety of areas including medicolegal contexts and when claimed stress is discrepant from objective findings and observations. When an individual is pursuing opioid-based medications for nonmedical purposes, they may attempt to conceal or mask their substance use, specifically opioid consumption, by presenting with fabricated symptoms of another physical or psychological problem that would require medication. This results in prescribers having to identify a genuine need for medication from disingenuous presentation, which makes it more difficult to provide the adequate care an individual needs. To understand how substance abuse problems may be presented, researchers have recognized four primary response styles of disacknowledgement, misappraisal, denial, and exaggeration as common indicators of deception when substance abuse is of concern (Rogers & Kelly, 1997; Stein et al., 2018).

According to Rogers and Kelly (1997) and Stein et al. (2018), the disacknowledgement response style consists of an individual disclaiming knowledge of their drug use or consequence from their use. This individual may report that they do not know of, or do not remember, using drugs or the consequences stemming from their use. The disacknowledgement response style is often specific to situations in which an individual misreports substance abuse, although it is unclear if the individual is sincere or not in the report. Similarly, the misappraisal response style consists of individual efforts to misreport substance abuse, but it is apparent that the individual is not attempting to conceal the use. The account is based solely on misinformation rather than an overt attempt to consciously deceive. For example, an individual may remember consuming opioids but claim to have difficulty correctly recalling the number of pills ingested.

The exaggeration and denial response styles of substance abuse mirror commonly acknowledged malingering and defensiveness terminology. For the exaggeration response style, the individual deliberately aggrandizes drug use or its consequences and may brag or boast about drug consumption or its effects. Exaggeration occurs less often than other response styles and is attributed to the individual's desire to lessen other unacceptable behavior or to enhance desirability. For example, an individual may over-report substance use to increase social desirability within a particular group. Lastly, the denial response style, more commonly known as defensiveness, is indicative of an individual who intentionally minimizes or rejects drug use or its consequences for a specific reason that may include wanting to avoid consequences or treatment, social desirability, or a reluctance to take responsibility for their behavior.

Of the four common response styles among those abusing substances, three types of distortions are most commonly observed. These include distortions regarding the "(1) amount and type of substance abuse, (2) immediate behavioral and psychological effects of substance

abuse, and (3) consequent impairment and psychological sequelae from cumulative substance abuse" (Rogers & Kelly, 1997, p. 111). In order to detect these distortions when misreporting substance abuse is of concern, a number of methods and measures are suggested. To detect a distortion of the amount and types of substances abused, Rogers and Kelly (1997) and Stein et al. (2018) propose assessing the accuracy of the individual's report through laboratory procedures. Immediate behavioral and psychological effects of substance abuse have not been thoroughly investigated, and there is currently no standardized method to assess this type of distortion. Conversely, psychometric methods tend to identify long-term effects and sequelae of substance abuse, including disorders resulting from chronic use. These methods are an indirect method of assessing genuineness of reports and may also assist in identifying cognitive deficits and personality characteristics, such as delinquency, that are common among substance abusers.

The response styles for misreporting substance abuse noted above highlight a challenging task for physicians to accurately assess patient reports of substance use, especially when opioid-based medications are considered. Considering that the exaggeration response style would inevitably limit access to opioids prescribed by a physician, it seems likely that disacknowledgement, misappraisal, or denial would be the most common response styles observed in healthcare settings. Still, the response styles and common distortions recognized by researchers only identify verbal reports of symptomology that may suggest opioid abuse or misuse. Along with verbal reports, researchers have recognized behavioral presentations frequently referred to as "drug-seeking" behavior that are often considered more than verbal report when prescribing opioid-based medications.

The term "drug-seeking" is often considered a stigmatizing idiom without clear criteria; it is used both in the literature and by health professionals, and generally describes behaviors of

individuals attempting to obtain opioid-based pain medication (Hamdan-Mansour et al., 2012; McCaffery et al., 2005). Some have posited that drug-seeking behavior may be observed in active addiction, pseudo-addiction, or as part of deviant behavior such as drug diversion (Weaver & Schnoll, 2002). Others define drug-seeking as knowingly breaking the law by seeking and obtaining controlled drugs in order to illicitly sell them; this may be driven by chemical dependency or a motivation to obtain medication for drug dealers who hired them (Goldman, 1999). McCaffery et al. (2005) reported that nurses generally described individuals engaging in drug-seeking behavior as those who frequent different emergency departments to obtain opioids, provide inconsistent reports about pain or medical history, or request refills because their medication was lost or stolen. Similar results were found by Hamdan-Mansour et al. (2012) among Jordanian nurses who indicated that stating the name and dose of the opioid and a preference of needles over pills were viewed as additional indicators of drug-seeking behavior. Overall, drug-seeking behavior appears rooted in displaying specific behavioral patterns to obtain opioid-based medications for non-medical purposes.

To assist in identifying drug-seeking behaviors, Pretorius and Zurick (2008) recommended that a systematic approach be implemented when drug-seeking is suspected. They suggested involving multiple health care professionals, recognizing suspicious behavior, obtaining a thorough history of present illness, and examining inconsistencies in an exam as steps to identify drug-seeking behavior. Involving multiple health care professionals, such as encouraging office staff in a primary care setting to observe an individual's level of functioning, may assist in identifying inconsistencies in reported symptoms. Family members accompanying the individual, along with previous physicians and pharmacists, are also recommended as resources with whom to consult to determine consistencies in patient reports. Suspicious

behavior among potentially drug-seeking individuals includes a tendency to be obsessive and impatient, calling for immediate appointments after missing follow-up appointments, and requesting adjuvant pain management medications. The identification of drug-seeking behavior appears to be a multifaceted endeavor that may be challenging in the fast-paced environment of health care settings, supporting the need for effective screening measures to help identify patients at risk of concealing abuse.

Malingered Chronic Pain

Considering that the primary use of opioids in medical settings is to treat pain, some may attempt to malinger chronic pain to obtain opioid-based medications for nonmedical purposes. Chronic pain is the fifth most common complaint in primary care settings, as approximately 50% of chronic pain cases are managed and treated within primary care offices (Rinkus & Knaub, 2008; Sarzi-Puttini et al., 2012). With the dramatic increase in heroin and opioid-based medication abuse, research has expanded to identify how physicians can manage and treat chronic pain while simultaneously reducing the risk of addiction (Butler et al., 2010; Edwards et al., 2011; Jamison et al., 2014; Meltzer et al., 2011). However, the debate regarding the prevalence of malingering in primary care settings is ongoing, as patients with unexplained pain symptoms are often viewed as possessing non-organic or psychogenic pain, or pain without an anatomical basis (Kumar, 2013). Additionally, individuals endorsing pain symptoms are seen by physicians as honest and true reporters since their primary focus is to provide care for ailments (Aronoff et al., 2007). Thus, malingering is infrequently deliberated, unless it is considered in conjunction with disability or worker's compensation evaluations, which subsequently hinders the development of assessment strategies focused on addiction risk (Kumar, 2013).

The current literature has suggested that the risk of addiction increases when opioid-based medications are prescribed to manage chronic pain. Additionally, literature tends to primarily focus on behavioral symptoms of addictive behavior in medical settings. In order to assess for this risk, prescribers heavily rely on observing behaviors and utilizing screening measures (Butler et al., 2008; Dougherty, 2012; Edwards et al., 2011; Jamison et al., 2011; Meltzer et al., 2011). Research regarding malingering in the chronic pain context has often compared true chronic pain patients to simulators (Crighton et al., 2014). Malingering research has also examined chronic pain patients involved in legal cases (Bianchini et al., 2014). This research appears to neglect how PCPs can assess the legitimacy of reported pain since simulators and chronic pain patients involved in legal cases are not often encountered in a primary care environment. Moreover, there appears to be a dearth of research identifying estimated or actual rates for malingered chronic pain in medical settings. One possible reason for this scarcity of research may be associated with the aforementioned belief of many physicians that patients seen for chronic pain symptoms are genuine and do not malinger. For physicians, it appears that managing addiction risk is secondary to treating chronic pain, with minimal focus on determining genuine chronic pain from malingered symptoms.

Assessment of Drug Abuse

Assessing drug abuse is a multidimensional process that includes the examination of the various facets of an individual. Most assessment procedures involve screening for any given substance use disorder to detect the possibility that a problem is present or needs further evaluation (Miller et al., 2011). Generally, asking about drug use is an informative approach that is commonly used to identify individuals who may be at risk for drug abuse; however, this is contingent upon the setting in which the assessment takes place (Miller et al., 2011). For

instance, individuals seen in healthcare settings may be defensive or hesitant to openly admit substance use when assessed. This may be due to the possibility that their substance use has not resulted in adverse consequences or may be related to the stigma associated with use. Individuals might also be deceptive due to a desire to obtain medications for nonmedical purposes. Still, purposeful questioning is one of the most common approaches for screening individuals, and entails asking carefully worded questions that are intermixed with general health and social issue questions to reduce defensiveness. For example, research has supported a 100% sensitivity and 74% specificity for the question "How many times in the past year have you used an illegal drug or used a prescription medication for nonmedical reasons?" However, this question assumes an individual will be forthcoming with their answer and does not account for the possibility of attempts to conceal their use.

Another option that can be used to screen for opioid abuse is urinalysis lab tests. This biological measure is often used in a variety of healthcare settings when substance abuse is suspected (Miller et al., 2011). Unlike self-report screeners, urinalysis is uninfluenced by motivational and cognitive factors; further, the accuracy of self-report may increase if an individual is aware of this screening process. Despite the potential benefits of urinalysis, the test often has low sensitivity resulting in false negatives, and has an approximate 2-3 day detection capability for opioids. Moreover, utilizing urinalysis is arguably too time consuming for general practice, affirming that additional measures are needed to identify opioid use, drug seeking behavior, malingering, and concealment.

The field of psychology is often involved in the assessment, treatment, and management of opioid abuse, although few assessment measures designed to specifically identify malingering and drug-seeking behaviors have been developed. Still, a number of psychological measures may

be used to assess this type of behavior using subscales that are part of a multi-scale inventory. For example, the Minnesota Multiphasic Personality Inventory (MMPI) and its revised forms, the MMPI-2 and the MMPI-2 Restructured Form (MMPI-2-RF), have included substance abuse subscales embedded in the most widely used objective personality adjustment inventories in the world (Friedman et al., 2015; Rogers & Kelly, 1997; Stein et al., 2018). Similarly, the Millon Clinical Multiaxial Inventory – Fourth Edition (MCMI-IV) includes the Alcohol Use and Drug Use scales to ascertain those at risk of substance abuse (Stein et al., 2018). Despite the notoriety of these psychological measures, the 567 items of the MMPI-2 and the 195 items of the MCMI-IV prove too cumbersome for primary care settings (McPherson & Hersch, 2000). Moreover, the subscales of these measures depend on acknowledged substance use and may not have the capacity to detect underreporting or denial, and may jeopardize the psychometric integrity of the subscales (Stein et al., 2018). Overall, there are a number of measures that can be used to assess for substance abuse problems. However, the prominent multi-scale inventories that are available would take too long to administer in a primary care setting, making these options unrealistic for fast-paced settings.

Factors Influencing the Liability of Opioid Abuse

The current literature indicates that researchers have recognized several factors that influence the liability of opioid abuse; specifically, being younger, male, having a history of substance abuse other than opioids, and having a mental health diagnosis (Edlund et al., 2007; Fiellin et al., 2013; Katz et al., 2013; Rice et al., 2012). A previous history of alcohol, marijuana, and tobacco use have also been correlated with opioid abuse (Fiellin et al., 2013; Page et al., 2016; Rice et al., 2012). However, Fiellin and colleagues (2013) reported that only marijuana use was associated with prescription opioid abuse among young women in their sample of 6,496

participants between the ages of 18-25 years old currently abusing opioid prescriptions. Moreover, Katz and colleagues (2013) reported that being unmarried, having any physical condition in conjunction with all mental disorders excluding anxiety disorders, and comorbid mental health disorders were significant predictors of nonmedical prescription opioid use among 34,653 participants from the National Epidemiologic Survey on Alcohol and Related Conditions.

Most predictively, others have noted that having access to opioids increases the risk for opioid abuse. For example, Edlund and colleagues (2007) studied 15,160 participants and found that those participants who possessed a larger supply of daily prescription opioids were more likely to develop opioid abuse and dependence. Similarly, Rice and colleagues (2012) compared opioid abusers (N = 6,380) and non-opioid abusers (N = 815, 536), and reported that opioid abusers filled approximately seven times as many opioid prescriptions in a year. Compared to non-abusers these individuals were prescribed four times as many different types of opioids, had prescriptions filled at over three times as many pharmacies, and were over nine times as likely to receive at least one early refill. Lastly, Page and colleagues (2016) reported that marital status, pain duration, and mental health-related quality of life were significantly associated with risk of opioid abuse among 3,040 patients from the Quebec Pain Registry. Although other factors can influence the development of opioid abuse, most of the research has indicated that having easy access to opioids, being male and younger, and previous substance use increased the risk for opioid abuse.

Substance Abuse Screeners

Since several factors have been identified that increase the risk of opioid abuse and misuse, substance abuse screeners have been developed over the years to assess for these and other factors. These include but are not limited to the Drug Abuse Screening Test (DAST;

Skinner, 1982), the Opioid Risk Tool (ORT; Webster & Webster, 2005), the Screener and Opioid Assessment for Patients with Chronic Pain-Revised (SOAPP-R; Butler, 2008), Screening Instrument for Substance Abuse Potential (SISAP; Coambs et al., 1996), and the Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs (CAGE-AID; Brown & Rounds, 1995). Most screeners provide a rapid and effective manner of evaluating self-acknowledged substance use (Stein et al., 2018) and may be readily used in a healthcare setting. However, there are currently no well-tested and easily administered screening tools to detect drug-seeking behaviors in health care settings (Gianutsos et al., 2008).

Only one study by Wooley and colleagues (2013) examined the effectiveness of the Drug Abuse Screening Test-20, Substance Abuse Subtle Screening Inventory-3, and Drug Use Screening Inventory-Revised when respondents were asked to engage in denial. Results indicated that denial was often undetected by these measures and that subtle scales with indirect item content were marginally better than face valid items when assessing denied drug use. Currently, the Substance Abuse Subtle Screening Inventory (SASSI) is the only known measure developed to assess acknowledged and unacknowledged substance abuse, where unacknowledged substance abuse is considered part of a malingering profile (Stein et al., 2018). Since the SASSI consists of 105 items and takes almost 15-20 minutes to complete, it is likely to be considered too lengthy for a health care setting.

Test Construction of Substance Abuse Screeners

Of the screeners identified above, all but the SOAP-R utilize a dichotomous response format to collect information from individuals completing the screener. Considering that most of these screeners were designed for primary care environments and are often used to assess for acknowledged substance abuse, these measures have not been extensively evaluated for the

purpose of detecting misreported substance use, or drug-seeking behavior. Additionally, there is a dearth of research regarding the effectiveness of dichotomous response formats when identifying those intending to misrepresent themselves on specific measures.

One of the challenges that arises from using substance abuse screeners to detect malingering, misreporting, and drug-seeking behavior is that most of these measures are face-valid and implement dichotomous response formats that may be easy to deceive. For example, individuals who read the question "have you abused prescription drugs?" from the Drug Abuse Screening Test (DAST; Skinner, 1982) easily recognize the intent of the question. Since the DAST utilizes a dichotomous response format, an individual who is actively abusing prescription drugs could mark "no" for the question. As a result, the prescriber must rely solely on clinical judgment to determine if the individual responded genuinely to items, making the use of screeners like the DAST inconsequential when misreporting substance use is of concern.

Similar to the use of dichotomous response formats to identify dishonest responding, there is little research that identifies other response formats, such as the Likert-scale, as a superior format when misreporting substance abuse is in question. However, some researchers have stated that Likert-scale response formats are more advantageous from a psychometric viewpoint than dichotomous response formats, and reported increased reliability and validity when the number of response options per item was increased on the Eysenck Personality Questionnaire (Muniz et al., 2003). Some of the allures of utilizing a Likert-scale response format when evaluating misreported substance use is that it offers more responses for an individual to choose from, and forces an individual to be more thoughtful when answering items, as compared to a dichotomous response format.

Moreover, the variability within a response format may also better capture an individual's belief regarding a particular statement on a given screener (McLeod, 2019), subsequently altering dichotomized and face-valid questions in a manner that may be more challenging to answer untruthfully. For example, when using a Likert response format for the question, "have you abused prescription drugs?" (DAST; Skinner, 1982), the question becomes "how often have you abused prescription drugs?" This change in question formatting to accommodate a Likert-scale response format forces an individual to select an answer that best represents their belief. If an individual intends to misreport substance use, it seems likely that an individual will select a response that will most likely help in avoiding detection. Therefore, if an individual answers in an affirmative way to the question "how often have you abused prescription drugs?" (i.e. "often" or "very often"), an individual assuredly jeopardizes their chances of receiving opioid-based medication, and may predictively select a more disconfirming belief regarding the question.

Predicting how an individual will respond to questions that assess substance abuse risk can be a difficult task, especially when the intent to misreport substance abuse is in question. However, of the four response styles recognized by Rogers and Kelly (1997) and Stein et al. (2018) it would seem that denial or defensive responding would be the most prevalent response pattern observed when misreporting substance abuse is intended. Considering that this response pattern emphasizes minimizing or rejecting drug use, it seems that a dichotomous response format of commonly used substance abuse screeners would be advantageous for their ultimate goal. Conversely, the use of a Likert-scale format may shift the advantage from an individual completing the screener to the healthcare professional. Thus, it appears that if a Likert-scale is used instead of dichotomous response format, those intending to misreport their substance use will select response options disconfirming questions about their substance use.

The potential for disconfirming questions regarding substance use and abuse may be due, in part, to an individual's fear of being denied the desired opioid-based medication. It is also possible that individuals might respond in a manner to be socially desirable and base their answers on what is most socially acceptable, rather than answering questions based on their true experience or belief (Coolican, 2014; Cozby, 2009). This could cause them to overcompensate when answering questions by selecting the least risky answer to present themselves in a positive manner. As a result, the individual intending to misreport substance abuse may essentially "fake-good" and overcorrect their responses to avoid detection. This positive response distortion has been well-documented in other populations that may also overcompensate by minimizing problematic behaviors when responding to test items. For example, Detrick and Chibnall (2014) examined the positive response distortion among police officer applicants completing the MMPI-2-RF. Results indicated that applicants tended to minimize and underreport personality characteristics that would make them less likely to obtain employment as a police officer.

Although the substance abuse population differs from police officer applicants and the MMPI-2-RF utilizes dichotomous response formatting, this study highlights the potential for individuals to positively distort test item responses and minimize problematic behaviors when pursuing something they desire. Additionally, the MMPI-2-RF's 338-item length allows for the use of a dichotomous response format, as the length of the measure still allows for significant variance among scores – a feature that is not afforded to brief substance abuse screeners. Thus, it seems beneficial to examine the potential for Likert-scale formatting on substance abuse screeners that currently employ dichotomous response formats to enhance the predictability of responses among those intentionally misreporting substance use.

Current Study

Given the current difficulties in assessing drug-seeking behaviors, the current study seeks to explore the effectiveness of commonly used self-report screeners to detect drug-seeking/malingering and unacknowledged substance use from a college sample and a substance abuse population. A simulation design will be utilized and will include three groups: college students who will be asked to pretend to have a substance abuse problem and malinger and hide their abuse when completing all measures, and randomly assigned online participants with a history of substance abuse asked to either malinger and hide their substance use or respond honestly to all measures. The design of this study is the first of its kind in utilizing a convenience sample and a substance abuse population to determine the effectiveness of screeners in detecting misreported substance abuse and the overall value of the rational driving the study. The original versions of the Drug Abuse Screening Test (DAST), the Opioid Risk Tool (ORT), the Screener and Opioid Assessment for Patients with Chronic Pain-Revised (SOAPP-R), the Screening Instrument for Substance Abuse Potential (SISAP), and the Cut, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs (CAGE-AID) will be utilized for the study. It is important to note that the screeners selected for this study have not been thoroughly investigated or utilized for identifying malingering/drug-seeking behavior, and the sensitivity and specificity of the screeners (see below) refer to the ability of the measures to identify a self-reported substance abuse problem.

Since all measures except for the SOAPP-R utilize dichotomous responses, the remaining four measures will be modified to incorporate a Likert response format. The modification of pre-existing measures is intended to ascertain if a Likert response format can identify a response pattern of those instructed to malinger/misreport substance use, as it is anticipated that

individuals who are attempting to obtain opioid-based pain medication will moderate their responses to minimize the risk of being detected. This study will add to the literature by identifying if screeners used in healthcare settings, or modified versions, can be used to detect drug-seeking behavior/malingering. It is the hope that the data collected from this study will add to the current knowledge and will inform the development of future screeners designed to assess malingering/drug-seeking behavior and unacknowledged substance abuse.

Hypotheses

1. Individuals instructed to malinger will have lower scores on the SOAPP-R, DAST, ORT, SISAP, CAGE-AID and SASSI-4, and modified versions of the DAST, ORT, SISAP, and CAGE-AID as compared to honest responders.
2. Likert-scale versions of the DAST, ORT, SISAP, and CAGE-AID will demonstrate greater internal consistency among both malingerers and honest responders as compared to the original dichotomous versions of the measures.
3. Likert-scale versions of the DAST, ORT, SISAP, and CAGE-AID will demonstrate better prediction of group membership (malingering versus honest responding) as compared to the original dichotomous versions of the measures.
4. The SASSI, which was developed specifically to identify malingering, will demonstrate the best performance at predicting group membership (malingering versus honest responding).

CHAPTER 3

METHODOLOGY

Overview and Design

The present study evaluated the ability of the DAST, ORT, SOAPP-R, SISAP, and CAGE-AID to detect malingering/drug-seeking behavior and unacknowledged substance use in a college and a substance abuse population sample. Response formats for all screeners except for the SOAPP-R were modified from a dichotomous format to a Likert style response set to examine if the type of response format can assist in detecting malingering/drug-seeking behavior and unacknowledged substance use. This study attempted to identify response patterns for participants on original and modified versions of the screeners to determine if the manner in which participants respond illustrated whether they concealed substance use or responded honestly. The present study used an analogue simulation research design in order to address the effectiveness of screeners in detecting malingering/drug seeking and unacknowledged substance use in a non-clinical population.

Power Analysis

The necessary sample size for statistical significance was determined by conducting a power analysis. A medium effect size was assumed and was based on Wooley et al., 2013 where their smallest within subjects effect with 80% power was $d = .5$. This effect size was utilized to obtain the best balance between sensitivity and specificity. Except for Wooley et al., 2013 there has been limited malingering/drug-seeking research conducted using the screeners selected for this study. 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 75 participants are needed per group when three groups are compared on individual measures using an ANOVA.

Participants

The recruitment and participant pool consisted of students from psychology classes at Indiana State University (ISU) and participants recruited from Prolific, an online platform designed to recruit research participants. A total of 279 student and online participants completed the study; 15 participants' data were removed due to incomplete (less than 75%) or missing data, 37 participants' data were removed due to incorrectly answering the manipulation check, and one participant's data was removed due to being under the age of 18. Overall, the total sample consisted of 226 participants.

For the total sample, the age of the participants ranged from 18-69 years, with the average age of participants being 29.03 years (SD = 11.36). The ethnicity of the participants was White/Caucasian (76.1%), Black/African American (11.1%), Asian/Asian American (4%), and Hispanic/Latino(a) (3.1%). Of the participants who reported their gender (N = 225), 58% were women and 39.8% were men. The participants' level of education was High School/GED (19%), Some College (57.1%), Bachelor's Degree (15.5%), and Master's Degree (4.4%). Of the participants who reported employment status (N = 223), 44.2% were not employed, 31.9% were employed full-time and 22.6% were employed part-time. Both groups were asked if they had a history of opioid addiction or misuse, though online participants only were required to have a history of substance abuse (i.e., alcohol and other non-related opioid substances) to participate in the study. As a result, more than half of the total sample (55.8%) denied having an addiction to opioids or having used opioids for nonmedical purposes.

Of the total sample, 78 were college students with a mean age of 19.38 (*SD* = 3.10). A total of 148 online participants participated in the study and were randomly assigned to a malingering or honest responding group. Of the 148 participants, 85 were assigned to the malingering group and had a mean age of 33.79 (*SD* = 11.30). The remaining 63 participants were similar in age (*M* = 34.56, *SD* = 10.20) and were assigned to the honest responding group. Notably, the college student sample was quite diverse and demographically different as compared to the online population. The majority of the college student sample were unemployed (62.8%) and 6.4% endorsed a history of opioid addiction or use for nonmedical purposes. Conversely, the majority of online participants were employed and endorsed a history of opioid addiction or use. Moreover, over 75% of college participants were female compared to roughly half of the online sample. See Table 1 for additional demographic information.

Measures

Demographic Questionnaire

Participants completed a demographic questionnaire that included information such as age, race/ethnicity, gender, year in school, employment status, and if they have ever had an addiction or abused prescription opioids. See Appendix C for the measure.

Marlowe-Crowne Social Desirability Scale (MCSDS)

The MCSDS consists of 33-items to determine an individual's social desirability bias that is described as the need to answer items in a "culturally sanctioned" manner and for societal approval (Crowne & Marlowe, 1960; Leite & Nazari, 2017). This measure was used to account for any possible covariance related to a social desirability bias that could have a direct effect on participant responses when completing individual measures. It consists of a dichotomous, true/false, response set where a 1 is given for socially desirable questions answered true and

socially undesirable answers marked false (Leite & Nazari, 2017). Interpreting the MCSDS is based on three ranges of scores identified as low, average, or high social desirability. Low scores (0-8) suggest answering in a socially undesirable manner that occurs in approximately 1 in 6 respondents. Average scores (9-19) suggest a moderate concern for social desirability based on their responses, and high scores (20-33) describe those who are highly concerned with social approval (Crowne & Marlowe, 1960). Crowne and Marlowe (1960) reported an internal consistency coefficient of .88 among 10 male and 29 female undergraduate participants, and a test-retest correlation of .89 for 31 of the 39 participants who completed the measure one month later. Others have suggested the utility of the MCSDS is more reliable for women than men, and suggest the measure be administered conjointly with the primary measure(s) of interest (Leite & Nazari, 2017). See Appendix D for the measure.

Drug Abuse Screening Test (DAST)

Developed in 1982, the DAST consists of 28 dichotomous self-report items that identify frequency of drug use, and legal, medical and interpersonal problems associated with use (Skinner, 1982; Stein et al., 2018). A score of "1" is given for each YES response, except for items 4, 5, and 7, for which a NO response is given a score of "1." Cutoff scores of 6 through 11 are considered to be optimal for screening for substance use disorders. Scores over 12 are considered "definitely a substance abuse problem." This measure has been comprehensively tested in justice, substance treatment, work, and psychiatric settings, and has been evaluated for underreporting substance abuse problems (Stein et al., 2018). It has high internal consistency (.92) and strong sensitivity (96%) and specificity (79-81%; McPherson & Hersch, 2000). Additionally, Skinner (1982) reported the DAST to have modest negative correlations with

denial (r = -.28) and social desirability (r = -.31 to -.38) among individuals seeking substance abuse treatment. See Appendix E for the measure.

Opioid Risk Tool (ORT)

The ORT is a 10-item dichotomous self-report screening tool specifically for adult patients in primary care settings (Webster & Webster, 2005). It is designed to assess risk for opioid abuse for individuals prescribed opioid-based pain medications for the treatment of chronic pain. The ORT is comprised of questions regarding family history of substance abuse, personal history of substance abuse, age of the individual, history of preadolescent sexual abuse, and psychological disease (Webster & Webster, 2005). The ORT is to be administered to patients upon an initial visit prior to beginning opioid therapy for pain management. It can be administered and scored in less than one minute and has been validated for both males and females (Webster & Webster, 2005). Each item is scored based on the gender of the individual, where a score of 3 or lower indicates low risk for future opioid abuse. A score of 4 to 7 indicates moderate risk for opioid abuse, and a score of 8 or higher indicates a high risk for opioid abuse. Patients categorized as high-risk are at increased likelihood of future abusive drug-related behavior. According to Webster and Webster (2005), the ORT produces excellent discrimination for both males (c = 0.82) and females (c = 0.85), and identified 94.4% of patients in the low risk category and 90.9% in the high risk category. Considering its development was for primary care settings, the ORT has not been validated in non-pain populations (Webster & Webster, 2005). See Appendix F for the measure.

Screener & Opioid Assessment for Patients with Chronic Pain-Revised (SOAPP-R)

The SOAPP-R is a 24-item self-report questionnaire developed to assess the frequency in which a patient on long-term opioid-based pain medications needs to be monitored (Butler et al.,

2008). It is simple to score, requires less than 10 minutes to complete, and is ideal for documenting decisions about the level of monitoring planned for a particular patient or justifying referrals to specialty pain clinics (Butler et al., 2008). Each item is scored on a 5-point Likert-scale, from 0 to 5, with higher scores indicative of a potential need to monitor patients while on opioid-based pain medications. A score of 18 or higher is considered positive for patients at-risk of abusing opioids. The SOAPP-R was validated with 500 chronic pain patients and was developed based on expert consensus for important concepts that are most likely to predict patients who need more or less monitoring on long-term opioid-based pain medication (Butler et al., 2008). The SOAPP-R has an alpha coefficient of .88, with 81% sensitivity and 68% specificity when the cutoff score is 18 (Butler et al., 2008). Although this measure helps identify those needing further monitoring in the treatment of pain, developers noted that this measure cannot detect malingering or concealment of substance abuse (Butler et al., 2008). See Appendix G for the measure.

Screening Instrument for Substance Abuse Potential (SISAP)

The SISAP is a 5-item questionnaire developed and validated from the data of the National Alcohol and Drug use Survey of 1989, and is designed to identify individuals with possible substance abuse histories in an efficient and accurate manner (Coambs et al., 1996). It consists of questions pertaining to number of drinks on a typical day, drinks in a typical week, use of marijuana or hashish in the last year, if the individual has ever smoked cigarettes, and the age of the individual. The SISAP produced similar sensitivity and specificity scores as the DAST (Coambs et al., 1996). Specifically, the SISAP produced 91% sensitivity, 78% specificity, 80% classification rate, and a low rate of false-negatives for a sample of 4,967 participants (Coambs et al., 1996; Solanki et al., 2011). Moreover, two questions from the measure (i.e. have you ever

smoked cigarettes? what is your age?) correctly classified 76% and 77% of substance abusers, respectively. See Appendix H for the measure.

Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs (CAGE-AID)

The CAGE-AID is a 4-item dichotomous self-report questionnaire adapted from the CAGE that tests for alcohol abuse and dependence (Brown & Rounds, 1995; Miller et al., 2011). By changing the wording of the four CAGE questions from alcohol only to alcohol and drug abuse and dependence, the four CAGE-AID questions assess alcohol and other drugs concurrently (Brown & Rounds, 1995; Miller et al., 2011). Positive screens of the CAGE-AID consists of one or more yes responses, suggesting that problems with substance use might exist (Brown & Rounds, 1995; Miller et al., 2011). Psychometric properties of the CAGE-AID appear modest, with a 79% sensitivity and 77% specificity for one or more yes responses, and a 70% sensitivity and 85% specificity for two or more yes responses (Brown & Rounds, 1995). See Appendix I for the measure.

Substance Abuse Subtle Screening Inventory – 4th Edition (SASSI-4)

The current version of the SASSI (SASSI-4) was developed in 2016 and consists of 105 items believed to identify acknowledged and unacknowledged substance abuse. Although the current version has yet to be adequately assessed by researchers unrelated to the measure, the SASSI-4 developers reported a 94% specificity in the test manual when utilized for a clinical sample (Lazowski & Geary, 2016). Thus, most of the current research is on the SASSI-3, and a number of studies have examined its psychometric properties. Researchers have reported the internal consistency of the SASSI-3 ranged from poor to excellent (alphas ranging from .27 to .95; Feldstein & Miller, 2007), along with questionable variability in test-retest reliability (Miller et al., 2009) and similar false negative rates (*N*-weight mean = 9%) when compared to simpler

measures such as the CAGE (Feldstein & Miller, 2007). However, the SASSI-3 manual reported 93% specificity when used with a clinical sample (Miller & Lazowski, 1999). See Appendix J for the measure.

For the current study, the dichotomous response formats of the DAST, ORT, SISAP, and CAGE-AID were modified into a four-point Likert-scale (i.e., Never, Seldom, Often, Very Often). Questions within each measure were adapted to accommodate a Likert-scale response format. All modified measures maintained the suggested cut-off scores outlined in the original manuals. Test items for the modified versions were recoded to accurately analyze the modified measures with the suggested cut-off scores. See Appendices K thru N for the modified measures.

Procedures

This study was administered via Qualtrics, an online platform for survey development and distribution. All participants were provided a web link to access information about the study and to complete the materials. Participants were provided with information about informed consent and agreed to participate prior to completing other materials. See Appendix O for the informed consent documents.

College participants were recruited from psychology classes at ISU using SONA, an online research participation management tool. They received course credit or extra credit for their participation, or a chance to win one of two $25 gifts cards to Amazon. All college participants had to be 18 years or older to participate. Additional participants were recruited using Prolific, an online platform designed to recruit research participants. They received $6.75 for their participation in the study, which lasted approximately 30 minutes. All Prolific participants had to be over the age of 18 and had to have a substance abuse history or were actively abusing substances to participate in the study.

All college student participants were assigned to the malingering group and will be referred to as College Malingering Group (CMG) from this point forward. Prolific participants were randomly assigned to one of two groups: the malingering group or the honest responding group and will be referred to as Prolific Malingering Group (PMG) or Prolific Honest Group (PHG). All participants completed the demographic questionnaire and Marlowe-Crowne Social Desirability Scale (MCSDS) and were instructed to answer the questions honestly. After completing the demographic questionnaire and the MCSDS, participants in the CMG and PMG were given a scenario, instructions, and goal (provided below), and asked to use this information to complete the study measures as though they are the person in the scenario who wants medications for nonmedical purposes.

> "**Instructions**: In this study you are asked to take on the role of someone who is going to see a doctor, and who wants to receive opioid pain medications. Below you are provided the scenario as well as your 'goal' to keep in mind while you imagine yourself in this situation. You will then complete the following questionnaires while remembering your goal.
>
> **Scenario**: You are at your doctor's office to try to receive opioid medications (e.g. Percocet, Oxycodone, OxyContin) because of your addiction to opioids. You are given a packet of questions to complete prior to meeting with your doctor.
>
> **Goal:** Your goal is to hide your addiction to opioids when answering the packet of questions so that your doctor will be more likely to prescribe these medications to you."

Participants randomly assigned to the PHG were given the following information:

> "**Instructions**: In this study you are asked to take on the role of someone who is going to see a doctor, and who wants to receive opioid pain medications. Below you are provided

the scenario as well as your 'goal' to keep in mind while you imagine yourself in this situation. You will then complete the following questionnaires while remembering your goal.

Scenario: You are at your doctor's office to try to receive opioid medications (e.g. Percocet, Oxycodone, OxyContin) because of your addiction to opioids. You are given a packet of questions to complete prior to meeting with your doctor.

Goal: Your goal is to answer the questions honestly, as if you have a current addiction to opioids."

Following the presentation of instructions, all participants were directed to a screen and asked to answer "Yes" or "No" to the question, "Do you understand what you are to do for the study?" If the participant answered "No", the participant was returned to the page with the prompt and instructed to reread the information again. All participants completed the measures online until they came to a final question used as a manipulation check that stated, "What was the goal you were given at the beginning of the study?" They were then directed to the debriefing statement at the conclusion of the testing session. See appendix P for debriefing statement.

CHAPTER 4

RESULTS

Scoring of original screeners were completed in accordance with the standardized instructions included in the manuals or standardized instructions for each assessment instrument. Modified screeners were scored to incorporate the standardized instructions by totaling the scores based on the dichotomous response format (i.e., False/No = 0, True/Yes = 1). Specifically, all answers on the modified Likert-scale versions except for "Never" were considered affirmative responses and were assigned a score consistent with the standardized instructions (i.e., Never = 0, Seldom = 1, Often = 1, Very Often = 1). Notably, the ORT utilized weighted scoring (e.g., assigning values for items based on importance and gender norms) and the SISAP implemented an "if/then" scoring protocol (e.g., If less than 5 drinks on a typical day for men/less than 4 for women, then ask question 2). For these screeners, scores were reviewed and manually entered into the database for analysis. 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.

Preliminary analyses were performed to identify the means and standard deviations for the total scores of the DAST, ORT, SOAPP-R, CAGE-AID, SISAP, SASSI-4, and modified versions of the DAST, ORT, CAGE-AID, and SISAP. The Prolific Honest Group (PHG) scored in the high risk range for substance abuse on the DAST, ORT, CAGE-AID, and SOAPP-R, and modified versions of the DAST, ORT, and CAGE-AID. Additionally, the PHG had the highest at risk percentage for substance abuse on the SASSI-4 (79.4%) and original and modified versions

of the SISAP (85.7%, 82.5%) as compared to the malingering groups. The Prolific Malingering Group (PMG) scored in the high risk range on the modified CAGE-AID, and the moderate risk range on the original and modified version of the ORT and the SOAPP-R. Notably, the College Malingering Group (CMG) scored in the moderate risk range for substance abuse on the SOAPP-R, which is the only measure the CMG elevated in the at risk range. See Table 2 for this descriptive data.

Scores on the MCSDS were analyzed to ascertain if social desirability affected participants' results on individual measures while completing the study. Specifically, Pearson correlation coefficients were calculated to test the associations between the MCSDS and total scores of the ten screeners. Results indicated that the MCSDS was significantly associated with most of the measures. The MCSDS was negatively correlated with the DAST, SOAPP-R, and SASSI-4, and modified versions of the DAST, ORT, and CAGE-AID and positively associated with the original and modified versions of the SISAP. See Table 3 for Pearson correlation coefficients. Although the College Malingering Group scored higher on the MCSDS than the other two groups ($F(2, 223) = 11.3$, $p < .001$), each of the three groups scored in the average range. Given these findings, the MCSDS was included in the model to account for its effects in multivariate analyses.

To test the first hypothesis that individuals instructed to malinger will have lower scores on the SOAPP-R, DAST, ORT, SISAP, CAGE-AID and SASSI-4, and modified versions of the DAST, ORT, SISAP, and CAGE-AID as compared to honest responders, a Chi Square analysis for the original and modified version of the SISAP and SASSI-4, and a multivariate analysis of covariance (MANCOVA) for all other measures were calculated. A chi-square test of independence that examined the relation between the SISAP and group membership was

significant, χ^2 (1, N = 226) = 47.6, p = < .001, ϕ = .459. The CMG (29.5%) was significantly less likely to score in the range of "use caution when prescribing opioids" category than the PMG (64.7%) and PHG (85.7%). Additionally, a chi-square that examined the relation between the modified version of the SISAP and group membership was significant, χ^2 (1, N = 226) = 54.37, p < .001, ϕ = .491, where scores for both the CMG (20.5%) and PMG (54.1%) were less likely to fall in the at-risk range as compared to the PHG (82.5%). Finally, the chi-square test for the SASSI-4 was also significant, χ^2 (1, N = 226) = 100.12, p < .001, ϕ = .666. The CMG (6.4%) and PMG (16.5%) were both significantly less likely to be classified as a "high probability" for substance abuse as compared to the PHG (79.4%). Thus, the malingering groups scored lower than the honest responding groups on the SISAP-modified version and the SASSI-4, but only the CMG scored significantly lower than the honest responding group on the SISAP.

The MANCOVA, including the MCSDS to account for its effects, was statistically significant (F(14, 404) = 23.07, p < .001, Wilks' Λ = .309, η2 = .444). Contrast codes indicate that total scores on the DAST (F(1, 208) = 265.80, p < .001, ORT (F(1, 208) = 281.56, p < .001), CAGE-AID (F(1, 208) = 195.80, p < .001), and SOAPP-R (F(1, 208) = 214.39, p < .001), significantly differed between the PHG and both malingering groups with the malingering groups scoring lower. Additionally, total scores on the modified versions of the DAST (F(1, 208) = 168.74, p < .001), ORT (F(1, 208) = 206.72, p < .001), and CAGE-AID (F(1, 208) = 189.59, p < .001), significantly differed between the PHG and both malingering groups with the malingering group scoring lower. Furthermore, total scores on the original ORT, and modified versions of the ORT and CAGE-AID significantly differed between the CMG and PMG.

To test the second hypothesis that Likert-scale versions of the DAST, ORT, SISAP, and CAGE-AID will demonstrate greater internal consistency among both malingerers and honest

responders as compared to the original dichotomous versions of the measures, Cronbach's alpha was calculated for each measure for the PHG and malingering groups (CMG & PMG). See Table 4 for all Cronbach's Alpha analyses. Results indicate modified versions of the DAST, ORT, and CAGE-AID had nominally better internal consistency than original versions for the PHG. However, the original version of the SISAP had nominally better internal consistency than the modified version for the PHG. For the PHG, the internal consistency of the ORT and the modified ORT version were significantly different. Modified versions of the ORT, CAGE-AID, and SISAP had nominally greater internal consistency than the original versions for the malingering groups (PMG & CMG). The DAST was the only original measure that had nominally greater internal consistency as compared to the modified versions for the malingering groups. The internal consistency between the ORT and ORT modified, and CAGE-AID and CAGE-AID modified were significantly different. Additionally, Pearson correlation coefficients were calculated to test the associations between modified and original versions of the four screeners (i.e., DAST, ORT, SISAP, CAGE-AID) for the honest (PHG) and malingering (CMG & PMG) groups. Results indicate that all original measures were significantly associated with the modified counterparts for the groups. Specifically for both groups, the DAST, ORT, SISAP, and CAGE-AID were positively associated with the modified versions. See Table 5 for Pearson correlation coefficients.

To test the third hypothesis that Likert-scale versions of the DAST, ORT, SISAP, and CAGE-AID will demonstrate better prediction of group membership (malingering versus honest responding), a discriminant analysis was performed. For this analysis two groups were analyzed and consisted of comparing the malingering group (i.e., CMG & PMG) and the PHG. Group membership was the dependent variable and all of the substance abuse screeners were treated as

predictor variables. A single discriminant function was calculated. The value of this function was significantly different for malingerers versus honest responders ($X^2 = 219.82$, $df = 10$, $p < .001$). The correlations between predictor variables and the discriminant function suggested that the original version of the DAST and ORT were the best predictors of group membership. See Table 6 for a complete list of standardized canonical coefficients. The fourth hypothesis predicted that the SASSI-4 would demonstrate the best predictive ability for group membership, but discriminant analysis results show the SASSI-4 performed worse than most other substance abuse screeners. Overall, the discriminant function successfully predicted group membership for 90.6% of cases, with accurate predictions being made for 94.7% of malingerers and 80% of honest responders.

To examine the sensitivity and specificity for each individual measure at identifying malingering, a cross tabulation analysis was completed with the results presented in Table 7. Sensitivity is described as how often a measure will identify malingering if a participant was instructed to malinger. Specificity reflects how often a measure will be negative for malingering if the person did not malinger. Results indicate that the original versions of the CAGE-AID had nominally better sensitivity and specificity as compared to the modified version, and the dichotomous SISAP had a nominally greater sensitivity than its Likert-scale counterpart. Conversely, the modified versions of the ORT performed nominally better for both sensitivity and specificity as compared to the original ORT. The modified version of the DAST nominally outperformed the original counterpart in sensitivity. The SASSI-4 had nominally better sensitivity and specificity compared to the original and modified DAST. The original versions of the CAGE-AID and SISAP, and modified versions of the CAGE-AID, SISAP, and ORT were nominally superior to the SASSI-4 in both sensitivity and specificity. Overall, the original

CAGE-AID and SISAP performed nominally better than the modified versions and the modified ORT and DAST performed nominally better than the original counterparts. The SASSI-4 demonstrated nominally worse sensitivity and specificity compared to most screeners.

CHAPTER 5

DISCUSSION

The opioid crisis consuming the U.S. has resulted in approximately 115 daily deaths (CDC, 2017) that may be partially due to prescribing practices of opioid-based pain medications. The screeners used to assess for opioid abuse are often dichotomous and face-valid, which allows individuals to hide their substance abuse with ease. Only one study by Wooley et al. (2013) has explored the utility of commonly used substance abuse screeners in detecting denial of drug use. As a result, the current study sought to further the efforts of the Wooley et al. (2013) study by examining if commonly used screeners can be used to detect opioid abuse that is intentionally hidden. In addition, four dichotomous screeners were modified to accommodate a four-point Likert-scale to assess the utility of whether response formatting can assist in detecting hidden substance abuse.

Preliminary analyses that identified means and standard deviations for the Prolific Honest Group (PHG), Prolific Malingering Group (PMG), and College Malingering Group (CMG) produced expected results. Specifically, PHG participants who were instructed to answer the questions honestly, as if they had a current addiction to opioids, were identified as ‘at risk’ for substance abuse for all ten measures. This finding is consistent with individuals described by Miller et al. (2011), who openly admit to substance abuse when carefully worded questions related to their use are asked. Thus, it is unsurprising that those who answered honestly regarding their substance abuse met the ‘at risk’ threshold on all measures. However, it was unexpected that the PMG scored in the high risk range on the modified CAGE-AID, and moderate risk range

on the modified and original versions of the ORT. It is possible that since the CAGE-AID consists of four items, PMG participants had less opportunity to adequately deceive the measure. Additionally, it is possible that the three levels of risk identified in the ORT may identify more participants in the moderate range than would otherwise be identified if only two risk levels (i.e., Low and High Risk) are used. This appears plausible especially when considering the CMG and PMG also scored in the moderate risk range on the SOAPP-R, a measure that used three risk levels to describe measurement outcome.

Results indicating that the MCSDS was significantly correlated with the DAST, SOAPP-R, and SASSI-4, and modified versions of the DAST, ORT, and CAGE-AID, suggest that these measures are vulnerable to the effects of social desirability. This result is largely expected considering an individual with less social desirability would be more inclined to report on substance abuse that may not be considered approved by society (Crowne & Marlowe, 1960; Leite & Nazari, 2017). It is worth noting that despite significant findings and incorporating it into a multivariate analysis to account for its effects, all three groups scored within the average range of social desirability on the MCSDS, which indicates that respondents tended to show an average degree of concern for social desirability of their responses (Crowne & Marlowe, 1960).

Findings that individuals instructed to malinger will have lower scores on all measures compared to honest responders was expected. Detrick and Chibnall (2014) found that police officer applicants tended to minimize and underreport personality characteristics that would make them less likely to obtain employment as a police officer when completing the MMPI-2-RF. Although different measures, the findings of the current study appear consistent with the Detrick and Chibnall (2014) study. All mean scores for the screeners completed by the CMG and PMG were less than the PHG. Notably, the CMG scored the lowest on all screeners compared to

the PMG and PHG. Although it is unclear why this occurred, it can be posited that CMG participants may be less nuanced in hiding substance abuse as compared to PMG participants. Specifically, CMG participants do not have a history of substance abuse and lack experience in hiding non-existent substance abuse problems from others. Conversely, the PMG's authentic substance abuse history possibly aided responses on measures based on skills developed through past or current experiences. Thus, the PMG participants may have been trying to malinger more subtly than the CMG participants, given their experience and history of substance abuse. Regardless, the malingering groups underreported substance abuse, which is problematic when physicians utilize these measures to make decisions about prescribed opioid-based medications.

The hypothesis that Likert-scale versions of the DAST, ORT, SISAP, and CAGE-AID will demonstrate greater internal consistency among both malingerers and honest responders as compared to the original dichotomous versions of the measures was partially supported. Though not completely statistically significant, most Likert-scale versions had better internal consistency for the PHG and both malingering groups compared to the original versions. The original versions of the SOAPP-R, CAGE-AID, and SISAP, and modified versions of the DAST, ORT, and CAGE-AID produced acceptable to excellent internal consistency levels for the PHG. For the combined malingering group, the original SOAPP-R and CAGE-AID, and modified versions of the DAST and CAGE-AID produced good to excellent internal consistency levels. The ORT was the only measure that had unacceptable internal consistency levels for both the PHG and malingering groups, suggesting the utility of this measure is poor.

Interestingly, the original, dichotomous version of the SISAP was more internally consistent than the modified version for the PHG, and the dichotomous version of the DAST had a better internal consistency than its modified counterpart for the combined malingering group.

For the SISAP, the original version had an acceptable internal consistency level, whereas the modified version of the SISAP had poor internal consistency. The dichotomous version of the DAST had an excellent internal consistency level compared to the good internal consistency level for the modified version. The reason that the original versions of the SISAP and DAST produced higher internal consistency coefficients compared to the Likert-scale versions remains unclear. However, several factors are considered.

Researchers have noted that a low alpha value could be due to a measure having a small number of questions, poor inter-relatedness between items, or heterogeneous constructs (Tavakol & Dennick, 2011). Since both versions of the SISAP have a low number of items (5 items), it seems the interrelatedness between items was affected when items were modified to accommodate a Like-scale response format. It also seems the DAST may be affected by poor inter-relatedness between items or heterogeneous constructs when questions were modified. Thus, it appears the original versions of the SISAP and DAST are more reliable due to the construction of items. In addition to evaluating the internal consistency of measures, the second hypothesis consisted of testing the associations between modified and original versions of the DAST, ORT, SISAP, and CAGE-AID for the PHG and both malingering groups. The modified versions were significantly positively correlated with their original versions, suggesting that the versions are highly related.

Findings for the third hypothesis were largely unexpected. The original version of the DAST and ORT were the best predictors of group membership, which was contrary to the assumption that Likert-scale versions would demonstrate better group membership (i.e., honest or malingering) prediction. It is possible that the DAST has the optimal number of items needed to effectively distinguish between groups, regardless of the response format (dichotomous or

Likert-scale), suggesting its potential utility in assessing hidden substance abuse. In contrast, the ORT demonstrated poor internal consistency in previous analyses and despite being a best predictor, the ORT poses a number of problems for accurate identification. Notably, the ORT utilizes gender norms to identify group membership, but does not provide guidelines for those who do not identify with traditional genders. Thus, the overall utility of the ORT appears poor despite its identification as a strong predictor.

In addition to identifying measures that best predicted group membership, sensitivity and specificity percentages for individual screeners indicate that all measures had low sensitivity, ranging from 3.1% to 47.9%, and moderate to high specificity, ranging from 69.4% to 91.9%. This finding was largely expected given that all screeners analyzed in this study, except for the SASSI-4, were not designed to detect malingering/hidden substance abuse. Still, the sensitivity range is concerning across all screeners and suggests that these screeners need to be developed further for the specific purpose of identifying hidden substance abuse. Additionally, the original CAGE-AID and SISAP and modified versions of the ORT and DAST possessed nominally superior or equal sensitivity and specificity compared to its counterpart. It is unclear why this occurred and is worth further exploration.

The SASSI-4 was one of the worst predictors by comparison and raised significant concerns regarding its utility in assessing hidden substance abuse even though it was specifically designed for that purpose. Additionally, the 94% specificity identified in the SASSI-4 manual (Lazowski & Geary, 2016) was not replicated in the current study, where specificity was 79.4%. The SASSI-4 also demonstrated nominally lower specificity when compared to original versions of the ORT, CAGE-AID, and SISAP, and modified versions of the same measures. Moreover, the SASSI-4 produced a nominally higher sensitivity and specificity than only two screeners.

Even more perplexing, given the substantial research supporting the SASSI for identifying hidden substance abuse (Lazowski & Geary, 2016; Miller & Lazowski, 1999) is that the SASSI-4 had nominally lower sensitivity than six screeners. Despite these concerns, several factors could explain the unexpected results.

Lazowski and Geary (2016) noted they utilized a clinical sample to determine specificity for the SASSI-4 manual and the current sample may not be a true indicator of what is observed in a clinical sample or clinical environment. Additionally, a participant's effort and focus in the current study, as is true with any other study, could potentially alter the results. Another possible explanation for current findings may involve the 105 items that make up the SASSI-4. Since this measure has the most items compared to all other screeners in the study, it is possible that more items provide a greater opportunity for participants to effectively malinger. Still, researchers have noted concerns with the SASSI with poor to excellent internal consistency across studies and similar false negative rates when compared to measures such as the CAGE (Feldstein & Miller, 2007). Thus, the utility of the SASSI-4 may be no better than the brief screeners utilized in the current study.

Clinical Implications

Considering opioid-based pain medications are the most prescribed medications in the U.S. (Sarzi-Puttini et al., 2012), primary care providers are saddled with the daunting task of providing appropriate treatment to those who may misreport or hide substance use and those who genuinely require opioid-based medication. Confounding this issue is studies that report physicians do not believe they received adequate training to prescribe opioid-based medications, do not feel confident in discussing issues of substance abuse with patients, and do not believe they possess the expertise to detect drug-seeking behavior and substance abuse (Anderson et al.,

2013; Bhamb et al., 2006; Dougherty, 2012; Jamison et al., 2014; Manjiani et al., 2014; Volkow & McLellan, 2016). Since there is no known screener to detect hidden substance use, primary care physicians (PCPs) are tasked with using clinical judgement and behavioral observations to differentiate patients misreporting substance use from those with a genuine need for opioid-based pain medications. This may create difficulties in accurate prescribing practices of opioid-based medications and highlights the need to provide PCPs with additional tools to accurately assess for hidden substance abuse.

The present study provides valuable insight into the utility of commonly used screeners in detecting hidden substance abuse. Except for Wooley et al. (2013), this study appears to be the first of its kind in examining multiple substance abuse screeners in conjunction with the SASSI-4, the only established measure specifically designed to detect unacknowledged substance abuse. Moreover, the current study is the only known study that analyzed the usefulness of Likert-scale response formats in identifying hidden substance abuse. The sample size for the current study is robust and consisted of a diverse population of online individuals believed to have a substance abuse problem and college students who were not considered to have a substance abuse problem and were used as a comparison sample.

Considering the novelty of the current study, clinical implications at this time are limited. All screeners explored in this study are in their infancy when it comes to their utility in identifying hidden substance abuse. As a result, PCPs are cautioned to use these screeners as they were intended. Still, many screeners, specifically the DAST, displayed promising results and are worth exploring further. The ORT also shows promise, though a number of issues such as poor reliability, need to be addressed before utilizing this measure to detect hidden substance abuse in a clinical setting. Based on current findings, utilizing the SASSI-4 in a clinical setting

raises significant concerns as it was one of the worst performing measures in the study. Despite its notoriety, PCPs are encouraged to reconsider its use until results from the current study can be investigated further. Overall, results of the current study provides necessary data needed to begin developing a screener that detects hidden substance abuse that will subsequently assist PCPs in accurately prescribing opioid-based medications to further combat the opioid epidemic.

Limitations

The current study has several limitations that could be improved upon in future research. First, the sample used may not be generalizable to other populations. The sample consisted of undergraduate college students enrolled in a general psychology course along with participants from an online population that was believed to have substance abuse problems. Additionally, participants operated in a controlled environment based on instructions provided in the study and may not be a true reflection of what is experienced in a clinical setting. Moreover, participants with a history of substance abuse recruited for the current study may not have ever used opioids. For example, it is possible an individual who reported having a past or current substance abuse problem was referring to other substances such as alcohol. Although this did not exclude them from the current study, participants with substance abuse problems other than opioids may have responded to items differently based on their experiences compared to those with an exclusive opioid issue. Second, a large number of participants were excluded from the study due to failing to answer the manipulation check correctly. This raises the possibility that instructions for the study may not have been readily understood, which cannot be definitively determined with an online population. Specifically, it is possible that participants instructed to malinger may have thought to continue to malinger when asked the manipulation check question. Third, modifying response formats to Likert-scales included options (i.e., Seldom, Often, Very Often) that could

be interpreted differently among participants. This may have influenced how participants responded to Likert-scale versions. Additionally, some researchers have suggested that at least a seven-point Likert-scale, instead of the current four-point Likert scale, should be used to maximize psychometric properties (Muniz et al., 2005). Finally, scoring protocols that utilize gender norms did not account for participants who identify with non-traditional gender norms. Thus, results for these participants could not be analyzed for certain measures and is a significant limitation for clinical practice.

Future Directions

While the present study added to the current literature and provided support to further explore the utility of brief screeners in detecting hidden substance abuse, more research examining the sensitivity, specificity, and reliability of these screeners in both non-clinical and clinical populations is needed. Future research should aim to replicate the present study and include modified Likert-scales that contain descriptors to operationally define the response options. Additionally, participants known to have opioid use problems specifically, instead of a general substance abuse history should be recruited for future studies considering most measures in the current study examined opioid use and abuse, and because PCPs specifically prescribe opioid-based pain medications. When findings from the current study are replicated with known opioid abuse populations, future research should focus on differentiating individuals hiding opioid abuse from those who do not have a history of substance abuse problems. Specifically, it is anticipated that individuals without a substance abuse problem will respond similarly to individuals hiding their substance or opioid abuse, making it difficult to differentiate between the two distinct populations. Thus, future research could benefit from factor analysis of screener

items to identify items that strongly correlate with malingering characteristics to develop a brief screening measure to detect hidden substance abuse.

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Table 1

Demographics of PMG, PHG, and CMG

	Prolific Participants		College Participants
Factor	Malingering Sample	Honest Sample	Malingering Sample
Age			
M (SD)	33.79 (11.30)	34.56 (10.20)	19.38 (3.10)
Race/Ethnicity			
% White/Caucasian	77.6	81.0	70.5
% Black/African American	8.2	1.6	21.8
% Hispanic/Latino(a)	1.2	7.9	1.3
% Asian/Asian American	2.4	4.8	5.1
% Native American	1.2	1.6	0.0
% Middle Eastern	2.4	0.0	0.0
% Multiracial	7.1	1.6	1.3
% Other	0.0	1.6	0.0
Gender			
% Male	49.4	49.2	21.8
% Female	45.9	50.8	76.9
% Other	4.7	0.0	0.0
Education			
% High School/GED	15.3	9.5	30.8
% Vocational Training	1.2	1.6	0.0
% Some Collge	22.4	33.3	29.5
% Some College-Enrolled	8.2	11.1	37.2
% Some College-No Degree	11.8	17.5	2.6
% Bachelor's Degree	24.7	22.2	0.0
% Master's Degree	9.4	3.2	0.0
% Doctorate/Ph.D.	3.5	1.6	0.0
% Other	3.5	0.0	0.0
Employment			
% Not Employed	34.1	34.9	62.8
% Part-time	14.1	22.2	32.1
% Full-time	50.6	42.9	2.6
History of opioid addiction/use for nonmedical purposes?			
% Yes	64.7	63.5	6.4
% No	35.3	36.5	93.6

Note. PMG = Prolific Malingering Group. PHG = Prolific Honest Group. CMG = College Malingering Group.

Table 2

Means and Standard Deviations for All Measures for PMG, PHG, and CMG

	Prolific Participants		College Participants
	Malingering Sample *N* = 85	Honest Sample *N* = 63	Malingering Sample *N* = 78
Measures	*M (SD)*	*M (SD)*	*M (SD)*
MCSDS	12.4 (5.1)	12.5 (6.1)	16.1 (5.5)
DAST	1.6 (3.8)	14.8 (8.7)*	1.1 (2.1)
DAST Modified	4.5 (6.1)	15.9 (8.8)*	2.1 (2.8)
ORT	4.1 (5.2)**	15.2 (6.0)*	2.0 (2.3)
ORT Modified	7.5 (7.3)**	18.3 (6.4)*	2.7 (3.2)
CAGE-AID	0.8 (1.4)	3.2 (1.3)*	0.3 (0.8)
CAGE-AID Modified	1.5 (2.8)*	6.7 (3.8)*	0.4 (1.2)
SISAP			
% Use Caution	64.7*	85.7*	29.5
% Low Risk	35.3	14.3	70.5
SISAP Modified			
% Use Caution	54.1*	82.5*	20.5
% Low Risk	45.9	17.5	79.5
SOAPP-R	12.5 (9.5)**	39.9.3 (17.1)*	11.7 (9.4)**
SASSI-4			
% High Probability	16.5	79.4*	6.4
% Low Probability	83.5	20.6	93.6

Note. PMG = Prolific Malingering Group. PHG = Prolific Honest Group. CMG = College Malingering Group. MCSDS = Marlowe-Crowne Social Desirability Scale. DAST = Drug Abuse Screening Test. ORT = Opioid Risk Tool. SOAPP-R = Screener & Opioid Assessments for Patients with Chronic Pain – Revised. CAGE-AID = Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs. SISAP = Screening Instrument for Substance Abuse Potential. SASSI-4 = Substance Abuse Subtle Screening Inventory-4th Edition. * = High Risk, ** = Moderate Risk.

Table 3

Correlations Between the MCSDS and All Measures for Total Sample

	r	Lower z	Upper z
DAST	-.157*	-0.29	-0.03
DAST Modified	-.207	-0.34	-0.08
ORT	-.097	-0.23	0.03
ORT Modified	-.169*	-0.30	-0.04
CAGE-AID	-.116	-0.25	0.01
CAGE-AID Modified	-.132*	-0.26	0.00
SISAP	.199**	0.07	0.33
SISAP Modified	.174**	0.04	0.30
SOAPP-R	-.166*	-0.30	-0.04
SASSI-4	-.197**	-0.33	-0.07

Note. N=226. MCSDS = Marlowe-Crowne Social Desirability Scale. DAST = Drug Abuse Screening Test. ORT = Opioid Risk Tool. SOAPP-R = Screener & Opioid Assessments for Patients with Chronic Pain – Revised. CAGE-AID = Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs. SISAP = Screening Instrument for Substance Abuse Potential. SASSI-4 = Substance Abuse Subtle Screening Inventory-4th Edition.
*$p \leq .05$., **$p \leq .01$., C.I. = 0.95

Table 4

Cronbach's Alpha of All Measures for PHG, PMG, CMG and Total Malingering Sample

		Prolific Participants		College Participants	Malingering Total
		PHG N = 63	PMG N = 85	CMG N = 78	PMG & CMG N = 163
Measures	Items	α	α	α	α
DAST	28	.95	.94	.81	.91
DAST Modified	28	.96	.91	.77	.88
ORT	11	.19	.47	-.20	.40
ORT Modified	11	.74	.70	.60	.69
CAGE-AID	4	.83	.91	.61	.85
CAGE-AID Modifed	4	.88	.94	.82	.93
SISAP	5	.71	.55	.63	.56
SISAP Modified	4	.53	.56	.57	.64
SOAPP-R	24	.93	.89	.88	.88
SASSI-4	105	.86	.82	.58	.81

Note. PHG = Prolific Honest Group. PMG = Prolific Malingering Group. CMG = College Malingering Group. DAST = Drug Abuse Screening Test. ORT = Opioid Risk Tool. SOAPP-R = Screener & Opioid Assessments for Patients with Chronic Pain – Revised. CAGE-AID = Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs. SISAP = Screening Instrument for Substance Abuse Potential. SASSI-4 = Substance Abuse Subtle Screening Inventory-4th Edition.

Table 5

Correlations Between Original and Modified Screeners for PHG, CMG & PMG

	PHG N = 63			CMG & PMG N = 162		
	r	Lower z	Upper z	*r*	Lower z	Upper z
DAST & DAST Modified	.713**	0.63	1.14	.538**	0.45	0.76
ORT & ORT Modified	.632**	0.49	0.99	.643**	0.59	0.90
CAGE-AID & CAGE-AID Modified	.785**	0.82	1.32	.752**	0.92	1.23
SISAP & SISAP Modified	.768**	0.77	1.27	.717**	0.86	1.18

Note. PHG = Prolific Honest Group. CMG = College Malingering Group. PMG = Prolific Malingering Group. DAST = Drug Abuse Screening Test. ORT = Opioid Risk Tool. SISAP = Screening Instrument for Substance Abuse Potential. CAGE-AID = Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs.
**$p \leq .01$., C.I. = 0.95

Table 6

Standardized Canonical Discriminant Function Coefficients

	Standardized	Structure Matrix
DAST	.456	.828
DAST Modified	-.094	.655
ORT	.374	.824
ORT Modified	.153	.685
SOAPP-R	.148	.748
CAGE-AID	.128	.697
CAGE-AID Modified	-.006	.684
SISAP	.029	-.278
SISAP Modified	-.157	-.321
SASSI-4	.053	.616

Note. DAST = Drug Abuse Screening Test. ORT = Opioid Risk Tool. SOAPP-R = Screener & Opioid Assessments for Patients with Chronic Pain – Revised. CAGE-AID = Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs. SISAP = Screening Instrument for Substance Abuse Potential. SASSI-4 = Substance Abuse Subtle Screening Inventory-4th Edition. Eigenvalue = 1.92. Overall canonical correlation = .81.

Table 7

Sensitivity, Specificity, False Positives, and False Negatives of All Measures for Malingering Outcome

	PHG, PMG & CMG			
Measures	Sensitivity	Specificity	False Positive	False Negative
DAST	3.1%	69.4%	30.6%	96.9%
DAST Modified	8.1%	69.4%	30.6%	91.9%
ORT			3.2%	73.6%
Moderate Risk	17.0%	9.7%		
High Risk	9.4%	87.1%		
ORT Modified			3.2%	58.5%
Moderate Risk	17.0%	4.8%		
High Risk	24.5%	91.9%		
CAGE-AID Modifed	22.7%	87.3%	12.7%	77.3%
CAGE-AID	24.1%	88.9%	11.1%	75.9%
SISAP	47.9%	85.7%	14.3%	52.1%
SISAP Modified	38.0%	82.5%	17.5%	62.0%
SOAPP-R			49.7%	3.2%
Moderate Risk	36.6%	17.5%		
High Risk	13.7%	79.4%		
SASSI-4	11.7%	79.4%	20.6%	88.3%

Note. N = 226. PHG = Prolific Honest Group. PMG = Prolific Malingering Group. CMG = College Malingering Group. DAST = Drug Abuse Screening Test. ORT = Opioid Risk Tool. SOAPP-R = Screener & Opioid Assessments for Patients with Chronic Pain – Revised. CAGE-AID = Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs. SISAP = Screening Instrument for Substance Abuse Potential. SASSI-4 = Substance Abuse Subtle Screening Inventory-4th Edition.

Appendix A

Instructions Prior to Filling Out Screeners for Prolific and College Malingering Participants

"**Instructions**: In this study you are asked to take on the role of someone who is going to see their doctor, and who wants to receive opioid pain medications. Below you are provided the scenario as well as your 'goal' to keep in mind while you imagine yourself in this situation. You will then complete the following questionnaires while remembering your goal.

Scenario: You are at your doctor's office to try to receive opioid medications (e.g. Percocet, Oxycodone, OxyContin) because of your addiction to opioids. You are given a packet of questions to complete prior to meeting with your doctor.

Goal: Your goal is to hide your addiction to opioids when answering the packet of questions so that your doctor will be more likely to prescribe these medications to you."

Appendix B

Instructions Prior to Filling Out Screeners for Prolific Honest Responding Participants

"**Instructions**: In this study you are asked to take on the role of someone who is going to see their doctor, and who wants to receive opioid pain medications. Below you are provided the scenario as well as your 'goal' to keep in mind while you imagine yourself in this situation. You will then complete the following questionnaires while remembering your goal.

Scenario: You are at your doctor's office to try to receive opioid medications (e.g. Percocet, Oxycodone, OxyContin) because of your addiction to opioids. You are given a packet of questions to complete prior to meeting with your doctor.

Goal: Your goal is to answer the questions honestly, as if you have a current addiction to opioids."

Appendix C

Background Questionnaire

1. What is your age? _____

2. What is your race/ethnicity?
    a. White/Caucasian
    b. Black/African American
    c. Hispanic/Latino(a)
    d. Asian/Asian American
    e. Native American/American Indian/Alaska Native
    f. Middle Eastern
    g. Biracial
    h. Multiracial
    i. Other (please specify) _____

3. What is your gender?
    a. Woman
    b. Man
    c. Other (please specify)_____

4. What is your highest level of completed education?
    a. No Formal Education
    b. High School/GED
    c. Vocational Training
    d. Some College-No Degree
    e. Some College-Currently Enrolled
    f. Master's Degree

g. Doctorate/Ph.D.

h. Other (please specify)_____

5. What is your employment status?

a. Not Employed
b. Part-time

c. Full-time

6. Have you ever had an addiction to opioids or used opioids for nonmedical purposes?
a. Yes
b. No

Appendix D

The Marlowe-Crowne Social-Desirability Scale

Directions: Read each item and decide whether it is true or false for you. Try to work rapidly and answer each question by answering True or False.

1. Before voting I thoroughly investigate the qualifications of all the candidates.

2. I never hesitate to go out of my way to help someone in trouble.

3. It is sometimes hard for me to go on with my work if I am not encouraged.

4. I have never intensely disliked anyone.

5. On occasions I have had doubts about my ability to succeed in life.

6. I sometimes feel resentful when I don't get my way.

7. I am always careful about my manner of dress.

8. My table manners at home are as good as when I eat out in a restaurant.

9. If I could get into a movie without paying and be sure I was not seen, I would probably do it.

10. On few occasions, I have given up something because I thought too little of my ability.

11. I like to gossip at times.

12. There have been times when I felt like rebelling against people in authority even though I knew they were right.

13. No matter who I'm talking to, I'm always a good listener.

14. I can remember "playing sick" to get out of something.

15. There have been occasions when I have taken advantage of someone.

16. I'm always willing to admit it when I make a mistake.

17. I always try to practice what I preach.

18. I don't find it particularly difficult to get along with loudmouthed, obnoxious people.

19. I sometimes try to get even rather than forgive and forget.

20. When I don't know something I don't mind at all admitting it.

21. I am always courteous, even to people who are disagreeable.

22. At times I have really insisted on having things my own way.

23. There have been occasions when I felt like smashing things.

24. I would never think of letting someone else be punished for my wrong-doings.

25. I never resent being asked to return a favor.

26. I have never been irked when people expressed ideas very different from my own.

27. I never make a long trip without checking the safety of my car.

28. There have been times when I was quite jealous of the good fortune of others.

29. I have almost never felt the urge to tell someone off.

30. I am sometimes irritated by people who ask favors of me.

31. I have never felt that I was punished without cause.

32. I sometimes think when people have a misfortune they only got what they deserved.

33. I have never deliberately said something that hurt someone's feelings.

Appendix E

The Drug Abuse Screening Test (DAST)

Directions: The following questions concern information about your involvement with drugs. Drug abuse refers to (1) the use of prescribed or "over-the-counter" drugs in excess of the directions, and (2) any non-medical use of drugs. Consider the past year (12 months) and carefully read each statement. Then decide whether your answer is YES or NO and check the appropriate space. Please be sure to answer every question. There are no right or wrong answers.

	YES	NO
1. Have you used drugs other than those required for medical reasons?	___	___
2. Have you abused prescription drugs?	___	___
3. Do you abuse more than one drug at a time?	___	___
4. Can you get through the week without using drugs (other than those required for medical reasons)?	___	___
5. Are you always able to stop using drugs when you want to?	___	___
6. Do you abuse drugs on a continuous basis?	___	___
7. Do you try to limit your drug use to certain situations?	___	___
8. Have you had "blackouts" or "flashbacks" as a result of drug use?	___	___
9. Do you ever feel bad about your drug abuse?	___	___
10. Does your spouse (or parents) ever complain about your involvement with drugs?	___	___
11. Do your friends or relatives know or suspect you abuse drugs?	___	___
12. Has drug abuse ever created problems between you and your spouse?	___	___
13. Has any family member ever sought help for problems related to your drug use?	___	___
14. Have you ever lost friends because of your use of drugs?	___	___
15. Have you ever neglected your family or missed work because of your use of drugs?	___	___
16. Have you ever been in trouble at work because of drug abuse?	___	___

17. Have you ever lost a job because of drug abuse? ___ ___

18. Have you gotten into fights when under the influence of drugs? ___ ___

19. Have you ever been arrested because of unusual behavior while under the influence of drugs? ___ ___

20. Have you ever been arrested for driving while under the influence of drugs? ___ ___

21. Have you engaged in illegal activities in order to obtain drug? ___ ___

22. Have you ever been arrested for possession of illegal drugs? ___ ___

23. Have you ever experienced withdrawal symptoms as a result of heavy drug intake? ___ ___

24. Have you had medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding, etc.)? ___ ___

25. Have you ever gone to anyone for help for a drug problem? ___ ___

26. Have you ever been in a hospital for medical problems related to your drug use? ___ ___

27. Have you ever been involved in a treatment program specifically related to drug use? ___ ___

28. Have you been treated as an outpatient for problems related to drug abuse? ___ ___

Appendix F

Opioid Risk Tool (ORT)

Note: This tool should be administered orally to patients upon an initial visit prior to beginning opioid therapy. A score of 3 or lower indicates low risk for future opioid abuse, a score of 4 to 7 indicates moderate risk for opioid abuse, and a score of 8 or higher indicates a high risk for opioid abuse.

Directions: The following are some questions given to patients upon initial visit prior to beginning opioid therapy. Please be sure to answer every question. There are no right or wrong answers.

Mark each box that applies	**Female**	**Male**
Family history of substance abuse		
Alcohol	1	3
Illegal drugs	2	3
Rx drugs	4	4
Personal history of substance abuse		
Alcohol	3	3
Illegal drugs	4	4
Rx drugs	5	5
Age between 16–45 years	1	1
History of preadolescent sexual abuse	3	0
Psychological disease		

ADD, OCD, bipolar, schizophrenia	2	2
Depression	1	1
Scoring totals		

Appendix G

Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R)

0	1	2	3	4
Never	Seldom	Sometimes	Often	Very Often

Directions: The following are some questions given to patients who are on or being considered for medication for their pain. Please be sure to answer every question. There are no right or wrong answers.

1. How often do you have mood swings?

2. How often have you felt a need for higher doses of medication to treat your pain?

3. How often have you felt impatient with your doctors?

4. How often have you felt that things are just too overwhelming that you can't handle them?

5. How often is there tension in the home?

6. How often have you counted pain pills to see how many are remaining?

7. How often have you been concerned that people will judge you for taking pain medication?

8. How often do you feel bored?

9. How often have you taken more pain medication than you were supposed to?

10. How often have you worried about being left alone?

11. How often have you felt a craving for medication?

12. How often have others expressed concern over your use of medication?

13. How often have any of your close friends had a problem with alcohol or drugs?

14. How often have others told you that you had a bad temper?

15. How often have you felt consumed by the need to get pain medication?

16. How often have you run out of pain medication early?

17. How often have others kept you from getting what you deserve?

18. How often, in your lifetime, have you had legal problems or been arrested?

19. How often have you attended an AA or NA meeting?

20. How often have you been in an argument that was so out of control that someone got hurt?

21. How often have you been sexually abused?

22. How often have others suggested that you have a drug or alcohol problem?

23. How often have you had to borrow pain medications from your family or friends?

24. How often have you been treated for an alcohol or drug problem?

Please include any additional information you wish about the above answers. Thank you.

Appendix H

Screening Instrument for Substance Abuse Potential (SISAP) Questionnaire

Notes: This tool should be administered orally to patients upon an initial visit prior to beginning opioid therapy. Use caution when prescribing opioids to these patients: a. Men who drink more than 4 alcoholic beverages per day or 16 per week b. Women who drink more than 3 alcoholic beverages per day or 12 per week c. Persons who admit to recreational use of marijuana or hashish in the previous year d. Persons who are younger than 40 years of age and smoke

1. If you drink, how many drinks do you have on a typical day?

If less than 5 for men/less than 4 for women, then ask question 2.
If 5 or more for men/4 or more for women, then you may stop here……...Use caution when prescribing opioids.

2. How many drinks do you have in a typical week?

If less than 17 for men/less than 13 for women, then ask question 3.
If 17 or more for men/13 or more for women, then you may stop here……Use caution when prescribing opioids.

3. Have you used marijuana or hashish in the last year?

If no, then ask question 4.
If yes, then you may stop here.....Use caution when prescribing opioids.

4. Have you ever smoked cigarettes?

If no, then you may stop here .....Probably a low opioid abuse risk.
If yes, then ask question 5.

5. What is your age?

If under 40 years of age, then you may stop here.....Use caution when prescribing opioids.
If 40 years of age or older, then you may stop here .....Probably a low opioid abuse risk.

Appendix I

Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs (CAGE-AID)

Directions: When thinking about drug use, include illegal drug use and the use of prescription drug use other than prescribed. Please be sure to answer every question. There are no right or wrong answers.

	YES	NO
1. Have you ever felt that you ought to cut down on your drinking or drug use?	____	____
2. Have people annoyed you by criticizing your drinking or drug use?	____	____
3. Have you ever felt bad or guilty about your drinking or drug use?	____	____
4. Have you ever had a drink or used drugs first thing in the morning to steady your nerves or to get rid of a hangover?	____	____

Appendix J

Substance Abuse Subtle Screening Inventory – 4th Edition (SASSI-4)

Directions: Please provide one answer for each question. There are no right or wrong answers; just answer the way you feel.

1. People know they can count on me for solutions.

2. Most people make some mistakes in their lives.

3. I usually "go along" and do what others are doing.

4. I have never been in trouble with the police.

5. I was always well behaved in school.

6. I like doing things on the spur of the moment.

7. I have not lived the way I should.

8. I can be friendly with people who do many wrong things.

9. I do not like to sit and daydream.

10. No one has ever criticized or punished me.

11. Sometimes I have a hard time sitting still.

12. People would be better off if they took my advice.

13. At times I feel worn out for no special reason.

14. I am a restless person.

15. It is better not to talk about personal problems.

16. I have had days, weeks or months when I couldn't get much done because I just wasn't up for it.

17. I am very respectful of authority.

18. I come up with good strategies.

19. I have been tempted to leave home.

20. I often feel that strangers look at me with disapproval.

21. Other people would fall apart if they had to deal with what I handle.

22. I have avoided people I did not want to speak to.

23. Some crooks are so clever that I hope they get away with what they have done.

24. My school teachers had some problems with me.

25. I have never done anything dangerous just for fun.

26. I need to have something to do so I don't get bored.

27. I have sometimes drunk too much.

28. Much of my life is uninteresting.

29. Sometimes I wish I could control myself better.

30. I believe that people sometimes get confused.

31. Sometimes I am no good for anything at all.

32. I break more laws than many people.

33. If some friends and I were in trouble together, I would rather take the whole blame than tell on them.

34. Crying does not help.

35. I think there is something wrong with my memory.

36. I have sometimes been tempted to hit people.

37. Most people would lie to get what they want.

38. I always feel sure of myself.

39. I have never broken a major law.

40. There have been times when I have done things I couldn't remember later.

41. I think carefully about all my actions.

42. I have used too much alcohol or "pot," or used to often.

43. Nearly everyone enjoys being picked on and made fun of.

44. I like to obey the law.

45. I frequently make lists of things to do.

46. I think I know some pretty undesirable types.

47. Most people will laugh at a joke now and then.

48. I have rarely been punished.

49. I use tobacco regularly.

50. At times I have been so full of energy that I felt I didn't need sleep for days at a time.

51. I have sometimes sat around when I should have been working.

52. I am often resentful.

53. I take all my responsibilities seriously.

54. I do most of my drinking or drug use away from home.

55. I have had a drink first thing in the morning to steady my nerves or to get rid of a hangover.

56. While I was a teenager, I began drinking or using other drugs regularly.

57. One of my parents was/is a heavy drinker or drug user.

58. When I drink or use drugs I tend to get into trouble.

59. My drinking or other drug use causes problems between me and my family.

60. New activities can be a strain if I can't drink or use when I want.

61. I frequently use non-prescription antacids or digestion medicine.

62. I have never felt sad over anything.

63. I have neglected obligations to family or work because of my drinking or using drugs.

64. I am usually happy.

65. I'm good at figuring out the plot in a spy drama or murder mystery long before the end.

66. I have wished I could cut down my drinking or drug use.

67. I am a binge drinker/drug user.

68. I often use energy drinks or other over-the-counter products to get me through the day.

69. I'm reluctant to tell my doctors about all the medications I'm using.

70. My doctors have not prescribed me enough medication to get the relief I need.

71. I know that my drinking/using is making my problems worse.

72. I have built up a tolerance to the alcohol, drugs, or medications I've been using.

73. Over time I have noticed I drink or use more than I used to.

74. I have worried about my parent(s)' drinking or drug use.

For each item below, circle the number which reflects how often you have experienced the situation described DURING THE TIME FRAME the administrator has checked below:

☐ Your entire life time ☐☐ The past six months ☐☐ The past twelve months

☐ The six months before _____ ☐☐ The six months since

_____

0	1	2	3
Never	Once or Twice	Several Times	Repeatedly

"Drinks" and "drinking" refer to any time of alcohol – beer, wine, hard liquor, etc.

1. Had drinks (beer, wine, liquor) with lunch?

2. Taken a drink or drinks to help you talk about your feelings or ideas?

3. Taken a drink or drinks to relieve a tired feeling or give you energy to keep going?

4. Had more to drink than you intended to?

5. Experienced physical problems after drinking (e.g., nausea, seeing/hearing problems, dizziness, etc.)?

6. Gotten into trouble on the job, in school, or with the law because of your drinking?

7. Became depressed after having sobered up?

8. Argued with your family or friends because of your drinking?

9. Had the effects of drinking recur after not drinking for a while (e.g., flashbacks, hallucinations, etc.)?

10. Had problems in relationships because of your drinking (e.g., loss of friends, separation, divorce, etc.)?

11. Became nervous or had the shakes after having sobered up?

12. Tried to commit suicide while drunk?

13. Found myself craving a drink or a particular drug?

Highest Grade Completed: ☐☐1-4 5-8 ☐☐9 ☐☐10 ☐☐11 ☐☐12/GED ☐☐Some College
☐2 Year College 4 Year College ☐☐Graduate Degree

Employment Status: ☐☐Full-time Part-time ☐☐Not Employed ☐☐Student
☐☐Homemaker
☐ Disabled Retired

Ethnic Origin: ☐☐American Indian or Alaska Native Asian ☐☐Black or African American
☐Canadian Native Hispanic ☐☐Native Hawaiian or Pacific Islander ☐☐White
☐Multiracial Other

Marital Status: ☐☐Married Unmarried Couple ☐☐Single ☐☐Divorced ☐☐Widowed
☐☐Separated

Number of People in Household:_____

Weekly Family Net Income: ☐☐Prefer not to answer $0 ☐☐Less than $200 ☐☐$200-300
☐$301-400 $401-500 ☐☐$501-600 ☐☐$601-700 ☐☐$701-800 ☐☐$801-900 ☐☐Over $900
☐Not Sure

0	1	2	3
Never	Once or Twice	Several Times	Repeatedly

The word “misuse” means taking medications in larger amounts than prescribed, longer than prescribed, or using medications not prescribed for you. “Drugs” include things like pot, cocaine, meth, heroin, etc.

1. Misused medications or took drugs to improve your thinking and feelings?

2. Misused medications or took drugs to help you feel better about a problem?

3. Misused medications or took drugs to become more aware of your senses (e.g., sight, hearing, touch, etc.)?

4. Misused medications or took drugs to improve your enjoyment of sex?

5. Misused medications or took drugs to help forget that you feel helpless and unworthy?

6. Misused medications or took drugs to forget school, work or family pressures?

7. Gotten into trouble at home, work, or with the police because of medications or drug-related activities?

8. Gotten really stoned or wiped out on drugs (more than just high)?

9. Tried to get ahold of some prescription drug (e.g., tranquilizers, pain killers, pills to calm nerves, sleep aids, etc.)?

10. Spent your spare time in drug-related activities (e.g., talking about drugs, buying, selling, taking, etc.)?

11. Used drugs or medications and alcohol at the same time?

12. Kept taking medications or drugs in order to avoid pain or withdrawal?

13. Felt your misuse of medications, alcohol, or drugs has kept you from getting what you want out of life?

14. Took a higher dose or different medications than your doctor prescribed in order to get the relief you need?

15. Used prescription drugs that were not prescribed for you?

16. Your doctor denied your request for medications you needed?

17. Been accepted into a treatment program because of misuse of medications, alcohol, or drugs?

18. Engaged in activity that could have been physically dangerous after (or while) drinking or using drugs or medications?

Appendix K

The Drug Abuse Screening Test (DAST) – Modified Version

Directions: The following questions concern information about your involvement with drugs. Drug abuse refers to (1) the use of prescribed or "over-the-counter" drugs in excess of the directions, and (2) any non-medical use of drugs. Consider the past year (12 months) and carefully read each statement. Then decide whether your answer is YES or NO and check the appropriate space. Please be sure to answer every question. There are no right or wrong answers.

0	1	2	3
Never	Seldom	Often	Very Often

1. How often have you used drugs other than those required for medical reasons?

2. How often have you abused prescription drugs?

3. How often do you abuse more than one drug at a time?

4. How often can you get through the week without using drugs (other than those required for medical reasons)?

5. How often are you able to stop using drugs when you want to?

6. How often do you abuse drugs on a continuous basis?

7. How often do you try to limit your drug use to certain situations?

8. How often have you had "blackouts" or "flashbacks" as a result of drug use?

9. How often do you ever feel bad about your drug abuse?

10. How often does your spouse (or parents) ever complain about your involvement with drugs?

11. How often do your friends or relatives know or suspect you abuse drugs?

12. How often has drug abuse ever created problems between you and your spouse?

13. How often has any family member ever sought help for problems related to your drug use?

14. How often have you lost friends because of your use of drugs?

15. How often have you neglected your family or missed work because of your use of drugs?

16. How often have you been in trouble at work because of drug abuse?

17. How often have you lost a job because of drug abuse?

18. How often have you gotten into fights when under the influence of drugs?

19. How often have you been arrested because of unusual behavior while under the influence of drugs?

20. How often have you been arrested for driving while under the influence of drugs?

21. How often have you engaged in illegal activities in order to obtain drugs?

22. How often have you been arrested for possession of illegal drugs?

23. How often have you experienced withdrawal symptoms as a result of heavy drug intake?

24. How often have you had medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding, etc.)?

25. How often have you gone to anyone for help for a drug problem?

26. How often have you been in a hospital for medical problems related to your drug use?

27. How often have you been involved in a treatment program specifically related to drug use?

28. How often have you been treated as an outpatient for problems related to drug abuse?

Appendix L

Opioid Risk Tool (ORT) – Modified Version

Directions: The following are some questions given to patients upon initial visit prior to beginning opioid therapy for pain management. Please be sure to answer every question. There are no right or wrong answers.

0	1	2	3
Never	Seldom	Often	Very Often

1. How often has a family member abused alcohol?

2. How often has a family member abused illegal drugs?

3. How often has a family member abused prescription drugs?

4. How often have you abused alcohol?

5. How often have you abused illegal drugs?

6. How often have you abused prescription drugs?

	YES	NO
7. Do you have a history of preadolescent sexual abuse?	____	____
8. Have you ever been diagnosed with ADD, OCD, bipolar, or schizophrenia?	____	____
9. Have you ever been diagnosed with depression?	____	____

Note: This tool should be administered to patients upon an initial visit prior to beginning opioid therapy for pain management. A score of 3 or lower indicates low risk for future opioid abuse, a score of 4 to 7 indicates moderate risk for opioid abuse, and a score of 8 or higher indicates a high risk for opioid abuse.

Scoring Protocol for the ORT – Modified Version

Mark the correct box where response was "often, very often"	**Female**	**Male**
1. How often has a family member abused alcohol?	1	3
2. How often has a family member abused illegal drugs?	2	3
3. How often has a family member abused prescription drugs?	4	4
4. How often have you abused alcohol?	3	3
5. How often have you abused illegal drugs?	4	4
6. How often have you abused prescription drugs?	5	5
7. Do you have a history of preadolescent sexual abuse?	3	0
8. Have you ever been diagnosed with ADD, OCD, bipolar, or schizophrenia?	2	2
9. Have you ever been diagnosed with depression?	1	1
Age between 16–45 years?	1	1
Scoring totals		

Appendix M

Screening Instrument for Substance Abuse Potential (SISAP) Questionnaire – Modified Version

Directions: Please be sure to answer every question. There are no right or wrong answers.

0	1	2	3
Never	Seldom	Often	Very Often

1. How often do you drink on a typical day?

2. How often do you drink in a typical week?

3. How often have you used marijuana or hashish in the last year?

4. How often have you smoked cigarettes?

5. What is your age? _____

NOTES

1. If often or very often for men and sometimes to often and very often for women use caution when prescribing opioids.
2. If often or very often for men and sometimes to often and very often for women use caution when prescribing opioids.
3. If often or very often to using marijuana or hashish in the last year, use caution when prescribing opioids.
4. If never to seldom to smoking cigarettes, probably a low opioid abuse risk.
5. If under the age of 40 use caution when prescribing opioids
   If 40 years of age or older probably a low opioid abuse risk

Use caution when prescribing opioids to these patients: a. Persons who are younger than 40 years of age and smoke b. Men who drink often or very often per day and per week c. Women who drink often and very often per day and per week d. Persons who smoked marijuana or hashish often or very often in the previous year.

Appendix N

Cut Down, Annoyed, Guilty, Eye-Opener-Adapted to Include Drugs (CAGE–AID) – Modified Version

Directions: When thinking about drug use, include illegal drug use and the use of prescription drug use other than prescribed. Please be sure to answer every question. There are no right or wrong answers.

0	1	2	3
Never	Seldom	Often	Very Often

1. How often have you felt that you ought to cut down on your drinking or drug use?

2. How often have people annoyed you by criticizing your drinking or drug use?

3. How often have you ever felt bad or guilty about your drinking or drug use?

4. How often have you had a drink or used drugs first thing in the morning to steady your nerves or to get rid of a hangover?

Appendix O

Informed Consent – College Participants

You are being invited to participate in a research study. This study aims to find out the ability of substance abuse questionnaires in detecting faked symptoms and/or drug seeking behaviors. The way you can help me with this study is by answering the questions in this anonymous survey, which should take you about 30 minutes. Your instructor may award extra credit OR you may have a chance to win one of two $25 gift cards to Amazon for participation in this study. If you decide to participate in this study, you will be asked to pretend to have a substance abuse problem and to answer questions so that you will not be identified as being "at risk" for substance abuse.

Some reasons you might want to participate in this research are that you might find it rewarding to learn about scientific psychological research and to participate in the process. Some reasons you might not want to participate in this research are the possibility of experiencing mild anxiety for being required to be deceitful when answering questions and the length of time it takes to complete the survey.

The choice to participate or not is yours; participation is entirely voluntary. You also can choose to answer or not answer any question you like, and to exit the survey if you wish to stop participating. No one will know whether you participated or not. If you continue with this study, you may withdraw at any time for any reason.

The survey asks questions about your age, ethnicity, gender, education, employment, marital status, and questions about substance use. You have been asked to participate in this research because the data collected from your responses may provide vital information needed to combat opioid addiction and may benefit the development of future substance abuse questionnaires.

Although every effort will be made to protect your answers, complete anonymity cannot be guaranteed over the Internet. Other potential risks of the study include feeling mild anxiety for being required to be deceitful.

It is unlikely that you will benefit directly by participating in this study, but the research results may benefit health care professionals who screen individuals for substance abuse as they will be provided information on potential response strategies on commonly used substance abuse

questionnaires. This will assist them in differentiating between honest and dishonest responders to provide appropriate medication for presenting problems and symptoms.

If you have any questions, please contact Dylan M. Songer, M.A., M.S., by mail at 7533 Argent Valley Drive, Raleigh, N.C. 27616, telephone (724) 766-1611 or by email at dsonger1@sycamores.indstate.edu. You may also contact the Dissertation Committee Chair, Jennifer Schriver, Ph.D., by telephone (812) 237-3950 or by email at Jennifer.Schriver@indstate.edu if you have further questions.

If you have any questions about your rights as a research subject or if you feel you have been placed at risk, you may contact the Indiana State University Institutional Review Board (IRB) by mail at Indiana State University, Office of Sponsored Programs, Terre Haute, IN 47809, by phone at (812) 237-3088 or by email at irb@indstate.edu.

Informed Consent – Prolific Participanrts

You are being invited to participate in a researchstudy. This study aims to find out theability of substance abuse questionnaires in detecting faked symptoms and/or drug seeking behaviors. The way you can help me with this study is by answering the questions in this anonymous survey, which should take you about 30 minutes. You will receive a monetary value $6.75 for participation in this study. If you decide to participate in this study,you will be asked to honestly fill out questionnaires about your past orcurrent use OR will be instructed to answer questions so that you will not bedetected as being at risk for substance abuse.

Some reasons you might want to participate in this research are that you might find it rewarding to learn about scientific psychological research and to participate in theprocess. Some reasons youmight not want to participate in this research are the possibility of experiencingmild anxiety for being required to be deceitful when answering questions and anxietyor distress by reliving past or current addictive thoughts/behaviors.

The choice to participateor not is yours; participation is entirely voluntary. You also can choose to answer or not answer any question you like, and to exit the survey if you wish to stopparticipating. No one will know whetheryou participated or not. Ifyou continue with this study, you may withdraw at any time for any reason.

The survey asks questionsabout your age, ethnicity, gender, education, employment, marital status, andquestions about substance use. You have been asked to participate inthis research because you endorsed, through a Prolificpre-screener question, as having substance abuse problems when answering thequestion regarding chronic condition/illness. Additionally, the data collectedfrom your responses may provide vital information needed to combat opioidaddiction and may benefit the development of future substance abusequestionnaires.

Although every effortwill be made to protect your answers, complete anonymity cannot be guaranteedover the Internet. Other potential risksof the study include feeling mild anxiety if you are required to be deceitful when responding to questions.

It is unlikely that youwill benefit directly by participating in this study, but the research resultsmay benefit health care professionals who screen individuals for substance abuse asthey will be provided information on potential response strategies on commonly used substance abuse

questionnaires. This will assist them in differentiatingbetween honest and dishonest responders to provide appropriate medication forpresenting problems and symptoms.

If you have any questions,please contact Dylan M. Songer, M.A., M.S., by mail at 7533 Argent Valley Drive,Raleigh, N.C. 27616, telephone (724) 766-1611 or by email at dsonger1@sycamores.indstate.edu. You may also contact the Dissertation Committee Chair, Jennifer Schriver, Ph.D., by telephone (812) 237-3950 or by email at Jennifer.Schriver@indstate.edu if you have further questions.

Appendix P

Debriefing

In this study, I am interested in determining if substance abuse questionnaires can be used to detect hidden opioid abuse/drug seeking behaviors. I am especially interested in determining if modified versions of commonly used substance abuse questionnaires are better at detecting hidden opioid abuse/drug seeking behaviors than non-modified versions.

If you experience any distress following this study, please contact the Indiana State University Student Counseling Center at (812) 237-3939 or the Indiana State University Psychology Clinic at (812) 237-3317. If you are not a student at Indiana State University you can seek support at http://www.mentalhealthamerica.net/ or https://findtreatment.samhsa.gov.

Thank you for your participation in this study. If you have any questions or if you are interested in the results of the study please contact Dylan M. Songer M.A., M.S., (724) 766-1611 or dsonger1@sycamores.indstate.edu.

Finally, please do not discuss this study with anyone because they may be participating in it in the future.