



Impulsivity and risk for prescription opioid misuse in a chronic pain patient sample



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HIGHLIGHTS

- Urgency is associated with opioid misuse and OUD symptoms in chronic pain patients.
- Sensation Seeking is associated with specific indices of prescription opioid misuse.
- It is important to measure facets of impulsivity when predicting opioid misuse.

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ABSTRACT

Misuse of, and addiction to, prescription opioid pain relievers is a growing concern, in both non-clinical samples and chronic pain patients receiving opioid analgesic therapy. Research is needed to identify which patients may be more prone to misuse or dependence on opioids in a chronic pain treatment setting. Based on literature showing the role of impulsivity in substance use disorders generally, we predicted that impulsivity may also be important to understanding which individuals may be at risk for opioid misuse when opioids are prescribed for pain. The present study examined associations between impulsivity facets and measures of prescription opioid misuse and symptoms. Four facets of impulsivity were examined: urgency, sensation seeking, lack of premeditation, and lack of perseverance. 143 patients receiving treatment for chronic pain at a regional pain clinic completed a series of questionnaires including the UPPS and measures of opioid risk and misuse. Consistent with predictions, urgency was associated with risk for future misuse ($\beta = 0.246, p < 0.05$), current misuse ($\beta = 0.253, p < 0.01$), and symptoms of current opioid use disorder (OUD; $\beta = 0.206, p < 0.05$). Sensation seeking was also associated with current misuse ($\beta = 0.279, p < 0.01$). These results suggest that identifying facets of impulsivity is important to understanding and assessing for risk of prescription opioid misuse in the context of chronic pain treatment. These data indicate that patients who react impulsively to negative mood states and cravings may be especially prone to developing aberrant use patterns when taking prescription opioids. This is the first known study to identify the role of urgency in predicting risk for OUDs in chronic pain patients.

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1. Introduction

An estimated ten million adults in the United States are taking prescribed opioid medications, four million of whom are regular users (Kelly et al., 2008). Prescription opioid medications are widely accepted to effectively treat acute pain related to injury, surgery, and chronic pain due to cancer treatment. However, risk for misuse of opioids is a growing concern among health care professionals and their patients. Though not everyone taking prescribed opioids will develop an opioid use disorder (OUD), prescription opioid use can lead to abuse and addiction, as well as other adverse consequences such as higher overall

healthcare costs (Manchikanti & Singh, 2008) and accidental overdose death (Chen, Hedegaard, & Warner, 2014). Despite a recent leveling off of prescription opioid misuse nationally (Dart et al., 2015), misuse of prescription opioids (i.e., any use other than how it is prescribed) increased 245% from 2004 to 2011 (Atluri, Sudashan, & Manchikanti, 2014) and remains a serious public health concern. Thus, more research is needed to identify which individuals are at risk for misuse or abuse of prescription opioid medications, especially in chronic pain treatment settings, where opioid pain medications are commonly prescribed.

Impulsivity is one factor that may predispose some individuals to be at higher risk for problematic use of prescription opioids. There is an abundance of evidence to suggest that the personality trait of impulsivity is associated with substance use disorders, especially alcohol use disorders (Sher, Bartholow, & Wood, 2000; Littlefield & Sher, 2010; Sher, Trull, Bartholow, & Vieth, 1999; Lejuez et al., 2010; Hopwood et al., 2011; Sher & Trull, 2002; Bornovalova, Daughters, Hernandez,

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Richards, & Lejuez, 2005; Gunn, Finn, Endres, Gerst, & Spinola, 2013; Slutske et al., 2002; James & Taylor, 2007; Stautz & Cooper, 2013). For example, Littlefield, Sher, and Steinley (2010) found that individual differences in impulsivity were important to the development of problematic alcohol use over a 16-year period. In both human and animal studies, impulsivity has been linked to the development and maintenance of substance use disorders (Belin, Mar, Dalley, Robbins, & Everitt, 2008; Dick et al., 2010). Further, impulsivity is associated with lower substance abuse treatment retention rates (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001) and initiating substance use at an earlier age (Dom, Hulstijn, & Sabbe, 2006).

Research on trait impulsivity has found that the construct is multifaceted, and that some facets of impulsivity are more important than others for predicting substance use and abuse.

Whiteside and Lynam (2001) helped to clarify the complex nature of impulsivity. Drawing upon the five-factor model, the researchers used factor analysis to identify four distinct personality facets: urgency, lack of premeditation, lack of perseverance, and sensation seeking. Further research using the UPPS has identified unique pathways to many disorders, including substance use disorders, among individual UPPS scales (Whiteside, Lynam, Miller, & Reynolds, 2005). Urgency refers to the tendency to act impulsively while experiencing negative emotions, lack of premeditation refers to reacting impulsively without accounting for future consequences, lack of perseverance refers to an inability to focus or persist on challenging or boring tasks, and sensation seeking refers to the tendency to initiate activities that are exciting and thrilling (Whiteside & Lynam, 2001). Examining trait impulsivity at the facet level has shown that some impulsivity constructs may be more strongly associated with risk for substance use disorders than others (Whiteside & Lynam, 2003). Urgency in particular seems to show the most consistent relationships with alcohol and drug use and problems across samples (see Table 1). In fact, in a study comparing substance dependent individuals with healthy controls, Verdejo-García, Bechara, Recknor, and Pérez-García (2007) found that, among the impulsivity dimensions, urgency was the strongest predictor of alcohol, drug, medical, family, employment, and legal problems. This suggests that the tendency to act impulsively while in a negative emotional state may underlie many substance use disorders. However, sensation seeking has also shown significant associations with alcohol problems, depending on which aspects of alcohol use/problems are being measured. For example, Coskunpinar, Dir, and Cyders (2013) found that urgency was related to problem drinking and alcohol dependence, while sensation seeking was related to binge drinking. Lack of premeditation and lack of perseverance show less consistent results across samples and substances.

No studies to date have tested associations between a full range of impulsivity facets and prescription opioid misuse. Only one study has specifically focused on prescription opioid use and impulsivity in patients receiving treatment for chronic pain conditions (Marino et al.,

2013). Marino et al. (2013) found that greater impulsivity (attentional, non-planning, and motor impulsivity) was related to greater risk for prescription opioid misuse, while sensation seeking was not associated with risk for misuse. However, this study did not measure urgency and only used a single measure of risk for misuse. These are significant caveats considering the associations between urgency and substance use disorders (Shin, Hong, & Jeon, 2012; Settles et al., 2012), and the differential relations with substance use measures noted above (e.g., Coskunpinar et al., 2013).

The purpose of the present study was to examine associations between the four facets of impulsivity (urgency, sensation seeking, lack of premeditation, lack of perseverance) and risk for prescription opioid misuse, current prescription opioid misuse, and opioid use disorder symptoms. We predicted that urgency would be the primary impulsivity facet associated with each of the opioid variables, based on the strong associations between urgency and alcohol problems. Second, we predicted that sensation seeking may also show associations with the opioid variables, based on sensation seeking's association with certain alcohol problems as well as previously observed associations with subjective effects of opioids (Zacny, 2010) and opioid dependence (Franques et al., 2003).

2. Method

2.1. Participants

Participants were 148 volunteers (103 females, 3 declined to specify) who had been referred for chronic pain treatment/management at a multimodal chronic pain treatment facility. This clinic specializes in treatment of severe and intractable pain. For inclusion in this study, participants must have been 1) referred to the clinic for chronic pain treatment/management, 2) at least 18 years of age, and 3) capable of reading English at an 8th grade level. Both new patients and established patients at the clinic were eligible to participate in the study.

Age data is reported in Table 2. The gender distribution of this sample (69% female) is consistent with similar studies of chronic pain populations, which have predominantly-female samples (see Dillie, Fleming, Mundt, & French, 2008; Hopwood, Creech, Clark, Meagher, & Morey, 2008; Neblett et al., 2013; Trageser, Bruns, & Disorbio, 2010). One hundred seven participants (72.8%) reported being of white, non-Hispanic ethnicity, 17 (11.6%) Native American, 7 (4.8%) Hispanic-American, 2 (1.4%) Asian-American, 1 (0.7%) African-American, 4 (2.7%) other, and 9 (6.1%) did not report ethnicity. Thirty-two participants (21.8%) reported using private insurance as payment for their pain treatment, 102 (69.4%) reported using Medicare or Medicaid, 5 (3.4%) reported using worker's compensation, 5 (3.4%) reported using some other method of payment, and 3 (2.0%) declined to respond. Six (4.1%) were employed full-time, 4 (2.7%) were employed part-time,

Table 1
Summary of studies examining UPPS impulsivity subscales and substance use.

Reference	Sample	Substance	Impulsivity Facets			
			SS	Urg	LPe	LPr
Shin et al. (2012)	Non-college young adults	Alcohol problems	X	X		
		Alcohol use	X	X		X
		Alcohol dependence	X	X		
		Binge drinking	X	X		
Adams, Kaiser, Lynam, Charnigo and Milich (2012) Magid and Colder (2007)	College College	Alcohol problem drinking	X	X		X
		Alcohol use	X			X
		Alcohol problems		X	X	
Fischer, Smith, Annus and Hendricks (2007) Verdejo-García et al. (2007)	College females with bulimic symptoms Substance abuse	Alcohol problems		X		
		SUD individuals		X	X	X
		Alcohol Problems				
		Drug problems		X		
Verdejo-García et al. (2010)	Rave party attenders	Poly-substance use		X	X	

UPPS impulsivity facets: SS = Sensation Seeking, Urg = negative urgency, LPe = Lack of Perseverance, LPr = Lack of Premeditation. An X under the specific UPPS subscale denotes a significant association while a blank space indicates that the scale was not significant.

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