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Short Communication

Opioid misuse and perceived smoking-pain relationships among HIV+ individuals with pain: Exploring negative affect responses to pain

Andrew H. Rogers[a], Lisa R. LaRowe[b], Joseph W. Ditre[b], Michael J. Zvolensky[a,c,d,*]

[a] Department of Psychology, University of Houston, United States
[b] Syracuse University, Department of Psychology, Syracuse, NY, United States
[c] Department of Behavioral Science, The University of Texas MD Anderson Cancer Center, United States
[d] HEALTH Institute, University of Houston, United States

HIGHLIGHTS

- HIV related pain is associated with opioid misuse and perceived smoking tobacco relations.
- Negative affect responses to pain account for variance in opioid and tobacco misuse.
- Negative affect responses to pain may be important clinical intervention targets.

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ABSTRACT

Persons living with HIV/AIDS (PLWHA) report high rates of clinically significant pain that is associated with several negative outcomes, including higher CD4 T-cell count, poor medication adherence, and substance use and misuse. Importantly, PLWHA also report elevated rates of both opioid and tobacco use, and these elevated rates have often been associated with increased pain experience. Although research suggests that negative affective responses to pain may be uniquely associated with substance misuse among individuals in the general population, little work has examined these relations among PLWHA. The current study examined negative emotions in response to pain as a predictor of current opioid misuse, future opioid misuse, and perceived smoking-pain relationships among 66 (M_{age} = 51.26, SD = 8.00, 60.6% male) HIV+ adults with co-occurring pain. Results indicated that negative emotions in response to pain uniquely predicted each of the substance use outcomes, with clinically significant effect sizes that may be characterized as medium in magnitude. Overall, these findings suggest that negative affective responses to pain may play a role in prescription opioid misuse and smoking among PLWHA. These findings may inform the development of tailored interventions for PLWHA smokers who are prescribed opioid pain medications.

1. Introduction

Persons living with HIV/AIDS (PLWHA) report elevated rates of clinically significant pain, including intractable neuropathic pain associated with HIV infection, as well as complications from long-term antiretroviral therapy (Krashin, Merrill, & Trescot, 2012; Verma, Estanislao, & Simpson, 2005). Pain has been reported as the most significant disability among PLWHA (Norval, 2004), and elevated rates of pain have been associated with a host of negative outcomes, including poor medication adherence (Lucey et al., 2011), lower CD4 T-cell count (Aouizerat et al., 2010), poor coping (Hart et al., 2000), and greater substance use and misuse (Tsao & Soto, 2009). PLWHA also endorse greater use of both prescription opioid medications (Krashin et al., 2012) and tobacco cigarettes (Tesoriero, Gieryic, Carrascal, & Lavigne, 2010), and there is emerging evidence that pain is associated with the use and misuse of opioids and tobacco among PLWHA (Burkhalter, Springer, Chhabra, Ostroff, & Rapkin, 2005; Tsao, Stein, & Dobalian, 2007). Given that tobacco smoking remains the leading cause of preventable death in the United States (U.S. Department of Health and Human Services, 2014), and that opioids are widely prescribed with significant risk of overdose and death (Center for Disease Control and Prevention, 2015, 2016), it is of critical public health importance to better understand individual difference factors associated with increased risk of opioid and tobacco misuse among PLWHA with co-

* Corresponding author at: Dept of Psychology, 3695 Cullen Blvd., Room 126, University of Houston, Houston, TX 77204, United States.
E-mail address: mjzvolen@central.uh.edu (M.J. Zvolensky).

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occurring pain.

1.1. Pain and opioid use among PLWHA

The relationship between pain and opioid use among PLWHA has been well documented in the literature. Several studies have shown that prescription opioids are efficacious in the treatment of neuropathic pain that often accompanies HIV infection (Dworkin et al., 2007; Krashin et al., 2012). However, studies further show that a significant number of providers do not adhere to recommended guidelines for prescribing opioids among PLWHA (Lum et al., 2011). PLWHA who use prescription opioids have also been shown to report more severe pain than PLWHA who do not use prescription opioids (Koeppe, Armon, Lyda, Nielsen, & Johnson, 2010), and increased pain has been associated with greater opioid misuse among PLWHA (Hansen et al., 2011) and individuals in the general population (Mercadante et al., 2015). Collectively, these findings highlight the complexities involved in managing pain in the context of HIV.

1.2. Pain and smoking among PLWHA

Less research has examined the relationship between smoking and pain among PLWHA. However, a significant body of research suggests that relations between pain and tobacco smoking are complex and likely bidirectional in nature (Ditre, Brandon, Zale, & Meagher, 2011; Zale, Maisto, & Ditre, 2016). For example, regular smoking is a risk factor for more severe pain (e.g., Shiri, Karppinen, Leino-Arjas, Solovieva, & Viikari-Juntura, 2010), pain has been shown to motivate smoking behavior (Ditre & Brandon, 2008), and there is evidence of covariation between nicotine dependence and prescription opioid misuse (Zale et al., 2015). Additionally, pain-related anxiety (worry about the negative consequences of pain) has been associated with a number of tobacco use behaviors (Ditre, Langdon, Kosiba, Zale, & Zvolensky, 2015; LaRowe, Langdon, Zvolensky, Zale, & Ditre, 2017). Although smoking behavior has been associated with greater experience of pain, recent work has begun to examine the perceived interrelations between pain and smoking (e.g., using cigarettes to cope with pain and not quitting smoking because of pain), which have been associated with greater pain intensity and interference (Weinberger, Seng, Ditre, Willoughby, & Shuter, 2018). Although work examining pain and smoking is relatively limited among PLWHA, research suggests that pain plays a clinically important role in determining smoking status and readiness to quit smoking (Burkhalter et al., 2005). Additionally, a randomized controlled smoking cessation trial among PLWHA found that those individuals with lower pain reported greater point-prevalent abstinence following treatment (Aigner et al., 2017). Overall, PLWHA report elevated rates of prescription opioid misuse and tobacco cigarette consumption that contribute to several deleterious outcomes, thus underscoring the importance of identifying factors that may link experiences of pain with these outcomes among PLWHA.

1.3. Fear-avoidance model of chronic pain

The fear-avoidance model of chronic pain provides an empirical framework to understand the link between experiences of pain and substance use behaviors among PLWHA (Vlaeyen & Linton, 2000). This model suggests that following a painful experience, individuals proceed into a negative feedback cycle whereby they experience elevated negative affect, fear pain-eliciting situations, and subsequently avoid potentially painful activities, thereby exacerbating both pain and pain-related disability (Vlaeyen & Linton, 2000, 2012; Zale, Lange, Fields, & Ditre, 2013). In relating this model to the current research, as PLWHA experience more severe pain and pain-related negative affect, they may be more likely to smoke cigarettes and self-administer opioid medication to avoid or mitigate such aversive states. Therefore, negative affective responses to pain may serve as a candidate mechanism linking the pain experience to substance use for pain coping among PLWHA.

Some work has examined the complex interplay between pain, negative affect, and substance misuse among PLWHA. In a study examining healthcare utilization among PLWHA, findings indicated that individuals with comorbid pain, mood, and substance use disorders (compared to those without substance use and pain), evinced a higher likelihood of a no-show medical visit for HIV care (Merlin et al., 2012). Additionally, PLWHA diagnosed with a mood or anxiety disorder and a substance use disorder were shown to report significantly greater pain than PLWHA without such diagnoses (Tsao & Soto, 2009). However, less empirical attention has been paid to how negative affective responses to pain (depression, anxiety) may be specifically associated with prescription opioid misuse and smoking for pain coping among PLWHA.

1.4. Current study

The current study examined negative affect responses to pain as a predictor of current opioid misuse, stated intentions to misuse opioids in the future, and perceived smoking-pain relations among PLWHA with co-occurring pain. It was hypothesized that negative affect responses to pain would be associated with greater current opioid misuse, stated intentions to misuse opioids in the future, and perceived smoking-pain relations, and that these effects would be evident over and above the contribution of theoretically relevant covariates, including gender, age, ethnicity, education, income, and average pain intensity.

2. Material and methods

2.1. Participants

Participants ($N = 66$, $M_{age} = 51.26$, $SD = 8.00$, 60.6% male) were recruited from a university hospital outpatient infectious disease clinic in central New York for a study examining the efficacy of a computer-based personalized feedback intervention (PFI) for HIV+ tobacco cigarette smokers who were prescribed pain medications (Ditre, LaRowe, De Vita, Vanable, & Zvolensky, 2018). Inclusion criteria for the current study included current tobacco cigarette smoking, current use of prescription pain medication, and age greater than 30. Participants were excluded if they reported currently attempting to quit smoking or an inability to speak and read English.

About half of all participants identified as black or African American ($n = 32$, 48.5%), 40.9% ($n = 27$) as white, and 10.6% ($n = 7$) as American Indian/Alaskan native. Additionally, 12.1% ($n = 8$) identified as Hispanic/Latino. More than half of the sample reported being single ($n = 49$, 60.6%), 13.2% ($n = 9$) married, 16.7% ($n = 11$) separated/divorced, and 9.1% ($n = 6$) widowed. The sample largely reported low income with 80.3% ($n = 53$) earning $19,999 or less per year, as well as low education levels, with 36.4% ($n = 24$) who did not graduate from high school (see Table A.1 for full demographic results).

In terms of pain, participants reported an average pain level of 6.36 ($SD = 3.35$) on a scale from 0 (*no pain*) to 10 (*pain as bad as it could be*), and 59.1% ($n = 39$) reported experiencing pain for 3 years or more. The three most commonly reported primary pain sites were back ($n = 25$, 37.9%), legs ($n = 12$, 18.2%), and feet ($n = 9$, 13.6%). Additionally, participants reported smoking an average of 13.29 ($SD = 11.06$) cigarettes per day for an average of 28.61 ($SD = 10.32$) years. Further, of the types of prescription pain medications used by participants in the current study, 59.1% indicated using an opioid medication.

2.2. Measures

2.2.1. Sociodemographic and smoking characteristics

A range of sociodemographic (e.g., age, gender, race/ethnicity, education, and income) and smoking characteristics (e.g., number of