Addictive Behaviors 42 (2015) 130–135

Contents lists available at ScienceDirect

Addictive Behaviors

Relations between pain-related anxiety, tobacco dependence, and barriers to quitting among a community-based sample of daily smokers

Joseph W. Ditre [a,*], Kirsten J. Langdon [b,c], Jesse D. Kosiba [a], Emily L. Zale [a], Michael J. Zvolensky [d]

[a] Department of Psychology, Syracuse University, United States
[b] National Center for PTSD, Women's Health Sciences Division, VA Boston Healthcare System, United States
[c] Boston University School of Medicine, United States
[d] Department of Psychology, University of Houston, United States

HIGHLIGHTS

- 17% of 122 daily smokers endorsed moderate to severe past-month pain.
- Pain-related anxiety was associated with tobacco dependence and barriers to quitting.
- These data underscore the importance of assessing pain among all smokers.
- Covariation between pain, pain-related anxiety, and smoking may impede quitting.

ARTICLE INFO

Available online 26 November 2014

Keywords:
Pain
Smoking
Anxiety
Cessation
Tobacco
Pain-related anxiety

ABSTRACT

There is increasing recognition that complex and potentially bidirectional relations between pain and smoking may be relevant to the maintenance of tobacco addiction. Pain-related anxiety has been identified as a mechanism in the onset and progression of painful disorders, and initial evidence indicates that pain-related anxiety may be associated with essential features of tobacco dependence among smokers with chronic pain. However, there has not been an empirical study of pain-related anxiety in relation to tobacco dependence and self-reported barriers to quitting among a community-based sample of daily smokers. The current sample was comprised of 122 daily smokers who were recruited from the local community to participate in a larger study that included an initial assessment of pain, smoking history, and pain-related anxiety. Approximately 17% of our sample endorsed moderate or severe past-month pain, nearly half met criteria for current anxiety or mood disorder, and about 30% met criteria for a current substance use disorder, exclusive of tobacco dependence. Results indicated that pain-related anxiety was uniquely and positively associated with both tobacco dependence severity scores and self-reported barriers to quitting. These findings lend support to the notion that pain-related anxiety may contribute to the maintenance of tobacco addiction among smokers who experience varying levels of pain severity.

1. Introduction

Pain and tobacco smoking are both highly prevalent and comorbid conditions, and accumulating research indicates that relations between pain and smoking are likely complex and bidirectional in nature (Ditre, Brandon, Zale, & Meagher, 2011; Parkerson, Zvolensky, & Asmundson, 2013). For example, pain has been shown to be a potent motivator of smoking (Ditre & Brandon, 2008; Ditre, Heckman, Butts, & Brandon, 2010); smoking has been identified as a unique causal factor in the onset and exacerbation of painful conditions (e.g., Sugiyama et al., 2010); and, there is evidence that pain may pose a significant barrier to smoking cessation (Zale & Ditre, 2013; Zale, Ditre, Dorfman, Heckman, & Brandon, 2014). To better inform the development of tailored cessation interventions for smokers in pain, researchers have recently turned their attention to the identification of mechanistic factors in the etiology, progression, and maintenance of comorbid pain and tobacco smoking. One factor that appears to be of theoretical and clinical importance is the cognitive–affective construct termed *pain-related anxiety*.

Pain-related anxiety reflects the tendency of an individual to respond with anxiety or fear to actual or potential pain experiences (McCracken, Zayfert, & Gross, 1992). Pain-related anxiety has been described as closely related to, but empirically and theoretically distinct from, other cognitive–affective constructs that tend to be encompassed

* Corresponding author at: Department of Psychology, Syracuse University, Syracuse, NY 13244, United States. Tel.: +1 315 443 2705.
E-mail address: jwditre@syr.edu (J.W. Ditre).

http://dx.doi.org/10.1016/j.addbeh.2014.11.032
0306-4603/

by the higher-order construct of pain-related fear, including fear of activities that may elicit pain (Lundberg, Grimby-Ekman, Verbunt, & Simmonds, 2011; Zale, Lange, Fields, & Ditre, 2013). Pain-related anxiety is a risk factor in the transition from acute to chronic pain (Boersma & Linton, 2006; Vlaeyen & Linton, 2000), and greater pain-related anxiety has been related to overestimated appraisals of pain intensity, maladaptive approaches to pain coping, and increased somatic reactivity in anticipation of pain-eliciting physical activity (McCracken, Gross, Sorg, & Edmands, 1993).

More recently, pain-related anxiety has been implicated in the maintenance of substance use in general (Hogan, Gonzalez, Howell, Bonn-Miller, & Zvolensky, 2010), and tobacco smoking in particular (Ditre, Zale, Kosiba, & Zvolensky, 2013; Gonzalez, Hogan, McLeish, & Zvolensky, 2010). For example, among a sample of daily smokers who endorsed recent body pain, pain-related anxiety was found to be positively associated with expectancies that smoking decreases negative affect (Gonzalez et al., 2010). In addition, and of direct relevance to the current study, pain-related anxiety was also observed to be uniquely and positively associated with tobacco dependence severity scores among a sample of daily smokers with chronic pain (Ditre et al., 2013). It is important to note that the associations observed in each of these studies remained significant even after accounting for a host of potential third variables, including, gender, pain intensity, smoking rate, and variance shared with related cognitive–affective constructs (e.g., generalized anxiety, anxiety sensitivity). Thus, pain-related anxiety may be uniquely related to tobacco dependence.

A growing body of empirical evidence suggests that pain and pain-related constructs are relevant to all smokers regardless of chronic pain status (e.g., Ditre & Brandon, 2008; Ditre et al., 2010; Zale et al., 2014). Considering that pain-related anxiety has been associated with tobacco dependence among smokers with chronic pain, an important next step in this line of research is to assess the extent to which pain-related anxiety may be associated with tobacco dependence among smokers recruited from the local community (i.e., those not specifically recruited for positive chronic pain status). There is evidence to suggest that smokers in pain may face unique challenges to smoking cessation (e.g., Hooten et al., 2011) and have limited confidence in their ability to successfully quit smoking (Zale et al., 2014). However, little is known about how cognitive–affective pain processes (e.g., pain-related anxiety) may be associated with perceived barriers to smoking cessation.

Accordingly, the goal of the present study was to test cross-sectional relations between pain-related anxiety, tobacco dependence severity scores, and self-reported barriers to quitting, among a community-based sample of daily smokers with varying levels of pain. Specifically, we hypothesized that greater pain-related anxiety would be associated with higher scores on a comprehensive, theoretically grounded, multidimensional measure of tobacco dependence (Wisconsin Inventory of Smoking Dependence Motives; Piper et al., 2004). We also hypothesized that greater pain-related anxiety would be associated with a greater number and magnitude of self-reported barriers to smoking cessation. Finally, we predicted that that these relations would remain significant after controlling for relevant sociodemographic factors, current pain severity, and the presence of comorbid anxiety, mood, or substance use disorders.

2. Method

2.1. Participants

Participants were recruited from the local community via flyers and newspaper advertisements for a larger smoking study that required a self-guided quit attempt. Interested participants were screened by phone for age (18–65), endorsement of current smoking (8 or more cigarettes per day for a minimum of one year), and willingness to make a self-guided quit attempt. Participants were excluded from the study if they endorsed current use of nicotine replacement or other tobacco products, current or past history of psychotic-spectrum symptoms or disorders, current substance dependence (excluding nicotine dependence), and current use of psychotropic medication. Eligible participants were scheduled for a baseline visit at which time they provided written, informed consent and smoking status was biochemically verified via expired breath Co ($\geq$8 ppm). Interviewer and self-report data utilized in the current analyses were collected during this baseline assessment visit prior to the self-guided quit attempt.

2.2. Measures

2.2.1. Pain-related anxiety

The Pain-Anxiety Symptoms Scale—20 item (PASS-20; McCracken & Dhingra, 2002) is a measure of anxious or fearful responses to pain, with higher total scores indicative of greater pain-related anxiety. Factor-analytic methods support a four-factor structure comprised of (1) escape/avoidance behaviors when confronted with pain, (2) physical anxiety associated with pain, (3) cognitive/affective anxiety associated with pain, and (4) fear of experiencing pain. The PASS-20 has demonstrated adequate reliability and validity in nonclinical samples (Abrams, Carleton, & Asmundson, 2007; McCracken & Dhingra, 2002), and internal consistency of the total score in the current sample was excellent (Cronbach's $\alpha = .91$). The internal consistency of the subscales was good (range of Cronbach's $\alpha = .75$– .86).

2.2.2. Recent bodily pain

The Short Form Health Survey—20 (SF-20; Stewart & Ware, 1992) is a 20 item self-report measure of general mental and physical health. Consistent with previous research, a single item was used to assess the presence of past-month bodily pain (i.e., "How much bodily pain have you had during the past four weeks"; Ware, Kosinski, & Gandek, 2000). Response options ranged from 1 *(None)* to 5 *(Severe)*.

2.2.3. Tobacco dependence

The Wisconsin Inventory of Smoking Dependence Motives (WISDM; Piper et al., 2004) is a 68-item, multidimensional index of tobacco dependence that yields a total dependence score (WISDM-Total), which is comprised of two composite scores (Primary Dependence Motives—PDM, and Secondary Dependence Motives—SDM). The WISDM assesses a broad range of dependence constructs, which allows for detection of theoretically- and clinically-meaningful distinctions among smokers (Piper et al., 2008). The PDM composite score is composed of four subscales that assess central features of tobacco dependence, whereas the SDM composite is comprised of nine subscales that assess situational motivators of smoking. The WISDM is a reliable and valid measure of tobacco dependence that demonstrated excellent internal consistency in the current sample across the total score and subscales (range of Cronbach's $\alpha = .91$–.97).

2.2.4. Self-reported barriers to smoking cessation

The Barriers to Cessation Scale (BCS; Macnee & Talsma, 1995) is a 19-item measure that assesses the severity of perceived difficulties associated with making a successful cessation attempt (e.g., withdrawal, lack of social support, feeling less in control of moods). Items are rated on a Likert-type scale from (0 = *Not a barrier/not applicable* to 3 = *Large barrier*). Consistent with prior work, we utilized the total score (Peasley-Miklus, McLeish, Schmidt, & Zvolensky, 2012), with higher total scores indicative of a greater number and magnitude of anticipated barriers to quitting. This measure has demonstrated good content validity, predictive validity and internal consistency (Macnee & Talsma, 1995). The internal consistency in the current sample was good (Cronbach's $\alpha = .87$).