Addictive Behaviors 39 (2014) 273–281

Contents lists available at ScienceDirect

Addictive Behaviors

Examining the relationships between posttraumatic stress disorder symptoms, positive smoking outcome expectancies, and cigarette smoking in people with substance use disorders: A multiple mediator model

Bryce Hruska [a], Jennifer Bernier [a], Frank Kenner [a], Deric R. Kenne [b], Alec P. Boros [c], Christopher J. Richardson [c], Douglas L. Delahanty [a,d,*]

[a] Kent State University, Department of Psychology, United States
[b] Kent State University, College of Public Health, United States
[c] Oriana House, Alcohol, Drug Addiction, and Mental Health Crisis Center, United States
[d] Northeastern Ohio Medical University (NEOMED), Department of Psychology in Psychiatry, Rootstown, OH, United States

HIGHLIGHTS

- We examined PTSD symptoms and cigarette smoking in people with SUDs.
- We examined positive smoking outcome expectancies as mediators of this relationship.
- PTSD symptoms were unrelated to cigarette smoking in this population.
- Several types of positive smoking outcome expectancies had significant effects.
- Negative affect reduction outcome expectancies had the largest mediating effect.

ARTICLE INFO

Keywords:
Posttraumatic stress disorder (PTSD)
Substance use disorder (SUD)
Cigarette smoking
Positive smoking outcome expectancies

ABSTRACT

Cigarette smoking is highly prevalent in people with substance use disorders (SUDs) and is associated with significant physical health problems. Posttraumatic stress disorder (PTSD) is also highly associated with both SUDs and cigarette smoking and may serve as a barrier to smoking cessation efforts. In addition, people with PTSD are more likely to hold positive smoking outcome expectancies (i.e., beliefs that smoking cigarettes results in positive outcomes); these beliefs may contribute to cigarette smoking in people with SUDs experiencing PTSD symptoms. The present study examined the relationship between PTSD symptoms and typical daily cigarette smoking/cigarette dependence symptoms in a sample of 227 trauma-exposed current smokers with SUDs (59.9% male, 89.4% Caucasian) seeking detoxification treatment services. Additionally, the indirect effects of multiple types of positive smoking outcome expectancies on these relationships were examined. Participants completed questionnaires assessing PTSD symptoms, positive smoking outcome expectancies, cigarette consumption, and cigarette dependence symptoms. Results indicated that PTSD symptoms were not directly related to cigarette consumption or cigarette dependence symptoms. However, negative affect reduction outcome expectancies were shown to have a significant indirect effect between PTSD symptoms and cigarette consumption, while negative affect reduction, boredom reduction, and taste-sensorimotor manipulation outcome expectancies were all found to have significant indirect effects between PTSD symptoms and cigarette dependence symptoms. The indirect effect involving negative affect reduction outcome expectancies was statistically larger than that of taste sensorimotor manipulation outcome expectancies, while negative affect reduction and boredom reduction outcome expectancies were comparable in magnitude. These results suggest that expectancies that smoking can manage negative affective experiences are related to cigarette smoking in people with SUDs experiencing PTSD symptoms and suggest that effective smoking cessation treatments should take into account these expectancies.

* Corresponding author at: Department of Psychology, 118 Kent Hall, Kent State University, Kent, OH 44242, United States. Tel.: +1 330 672 2395; fax: +1 330 672 3786.
E-mail address: ddelahan@kent.edu (D.L. Delahanty).

0306-4603/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.addbeh.2013.10.002

1. Introduction

Cigarette smoking is associated with a variety of physical health problems (e.g., pulmonary, cardiovascular, and peripheral vascular disease), and remains one of the most preventable causes of death in the United States (CDC, 2004; Fagerström, 2002). Although in the general United States population cigarette smoking has decreased substantially in the last 45 years, (CDC, 2011), it remains highly prevalent in people with psychopathology (Kalman, Morisette, & George, 2005). Substance use disorders (SUDs) are particularly likely to be associated with smoking: 56.1% of people with alcohol abuse/dependence and 69.7% of people with drug abuse/dependence are current smokers (Lasser et al., 2000). In contrast, 19.3% of people in the general U.S. population are current smokers (CDC, 2011). This discrepancy is notable given that people with SUDs experience a variety of physical health problems that may be either caused or exacerbated by smoking (Mertens, Lu, Parthasarathy, Moore, & Weisner, 2003). Furthermore, smokers with SUDs are more likely to die from a tobacco-related physical health problem than from a physical health problem stemming from their substance use (Hurt et al., 1996).

1.1. Cigarette smoking & anxiety disorders

Given the high comorbidity rates between SUDs and smoking, the integration of smoking cessation interventions into substance use treatment protocols has been widely advocated (Baca & Yahne, 2009). Such integrated interventions have demonstrated short-term success; however, long-term smoking cessation has not been as successful (see Prochaska, Delucchi, & Hall, 2004 for a review). One reason for this failure may be the presence of untreated comorbid anxiety disorders. Among individuals with a current SUD, between 17.7% and 35.6% also have a current comorbid anxiety disorder (Grant et al., 2004; Kessler et al., 1996). This comorbidity is notable, given that anxiety disorders are also highly associated with cigarette smoking (see Morisette, Tull, Gulliver, Kamholz, & Zimering, 2007 for review) and thus may contribute to smoking in people with SUDs.

The most common explanation for the association between smoking and anxiety is the self-medication hypothesis (Morisette et al., 2007). This hypothesis is rooted in Khantzian's (1997) clinical work suggesting that individuals use psychoactive drugs such as cigarettes to reduce negative affect that may stem from a variety of sources (e.g., daily stressors and psychopathology). Among smokers without other psychopathology, negative affect is often cited as the prime motivation for engaging in cigarette smoking (for review see Brandon, 1994). Additionally, in smokers who have maintained short-term periods of smoking cessation, higher levels of negative affect have been shown to occur immediately before relapse (Shiffman & Waters, 2004). Furthermore, research using ambulatory modeling techniques demonstrates that episodes of negative affect often precede cigarette smoking (Delfino, Jamner, & Whalen, 2001) and negative affect is reported to decrease in smokers following cigarette consumption (Carter et al., 2008).

Research examining smoking in the context of anxiety disorders also supports the self-medication hypothesis. For instance, smokers with anxiety disorders report greater negative affect compared to smokers without anxiety disorders (Dierker & Donny, 2008; Morisette, Brown, Kamholz, & Gulliver, 2006; Moylan, Jacka, Pasco, & Berk, 2012), and as the negative affect associated with anxiety disorders increases in severity, cigarette consumption increases as well (Lawrence, Considine, Mitrou, & Zubrick, 2010). Finally, smokers with anxiety disorders – such as panic disorder – frequently cite the desire to reduce negative affect as one of their prime reasons for engaging in cigarette smoking (Zvolensky, Feldner, Leen-Feldner, & McLeish, 2005). Given these associations, the presence of untreated comorbid anxiety symptoms in people with SUDs may serve as a source of negative affect contributing to cigarette smoking.

1.2. Cigarette smoking & PTSD

One anxiety disorder in particular that is highly comorbid with SUDs and that may serve as a source of negative affect contributing to cigarette smoking is posttraumatic stress disorder (PTSD). To qualify for a PTSD diagnosis, an individual must experience an event that involves threat of harm to either themselves or someone else, evoking a response of intense fear, helplessness, or horror (American Psychiatric Association, 2000). In addition, individuals exposed to such events must report experiencing symptoms that can be grouped into three categories: reexperiencing symptoms (e.g. reliving the traumatic event and feeling as if it were re-occurring), avoidance/numbing symptoms (e.g. avoiding places, situations, or people that are associated with the traumatic event/feeling emotionally numb), and hyperarousal symptoms (e.g. feeling jumpy or being overly alert). A PTSD diagnosis is considered when an individual who experiences trauma reports the presence of these symptoms for at least 1 month and also experiences functional impairment in one or more domains of life as a result of their trauma symptoms (APA, 2000).

Between 10.9% and 41.4% of individuals seeking treatment for a SUD also meet criteria for current PTSD (Dragan & Lis-Turlejska, 2007; Driessen et al., 2008; Najavits et al., 2003; Read, Brown, & Kahler, 2004). In addition, PTSD has been consistently associated with greater daily cigarette consumption (Beckham et al., 1997; Buckley, Mozley, Bedard, Dewulf, & Greif, 2004), even after controlling for trauma history and co-occurring depressive symptoms (Acierno, Kilpatrick, Resnick, Saunders, & Best, 1996; Op den Velde et al., 2002). Furthermore, PTSD has been shown to be associated with nicotine dependence after controlling for the presence of comorbid anxiety disorders (Cougle, Zvolensky, Fitch, & Sachs-Ericsson, 2010). Finally, longitudinal research indicates that PTSD increases the risk for subsequent first onset daily cigarette smoking (Breslau, Novak, & Kessler, 2004) as well as first onset cigarette dependence (Breslau, Davis, & Schultz, 2003). Collectively these studies suggest that PTSD has a specific impact on smoking behavior and may also increase risk for the development of cigarette smoking.

Research examining smoking in people with PTSD has largely supported the self-medication hypothesis. Motivation to smoke cigarettes in an effort to reduce negative affect has been shown to characterize people with PTSD (Beckham et al., 1997). In addition, higher levels of PTSD symptom severity have been associated with greater motivation to reduce negative affect even after controlling for gender differences and differences in daily cigarette consumption (Feldner et al., 2007). Stronger evidence for the role of self-medication as an explanation for PTSD-cigarette smoking comorbidity comes from experimental research. In response to trauma and stress imagery, smokers with PTSD report greater increases in negative affect and cigarette craving compared to smokers without PTSD (Beckham et al., 2007). Furthermore, ambulatory monitoring techniques have revealed that people with PTSD are more likely to smoke in response to negative affect and are more likely to report a reduction in negative affect after smoking a cigarette than those people without PTSD (Beckham et al., 2008).

1.3. Positive smoking outcome expectancies in PTSD

A number of cognitive-motivational variables may be relevant for understanding the relationship between PTSD and cigarette smoking with two of the most important being smoking motives and smoking outcome expectancies. Although conceptually related, these two constructs are distinct in that smoking motives refer to the reasons that motivate a person to engage in cigarette smoking (Shiffman, 1993), while smoking outcome expectancies refer to the beliefs that an individual holds concerning the anticipated consequences of smoking cigarettes (Brandon, Juliano, & Copeland, 1999).

While both constructs are useful for understanding cigarette smoking behavior, within the addiction literature smoking outcome expectancies