



Anxiety sensitivity explains associations between anxious arousal symptoms and smoking abstinence expectancies, perceived barriers to cessation, and problems experienced during past quit attempts among low-income smokers

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ARTICLE INFO

Article history:

Received 5 August 2016

Received in revised form 7 November 2016

Accepted 15 December 2016

Available online 21 December 2016

Keywords:

Anxiety sensitivity

Smoking

Low-income

ABSTRACT

Disproportionately more smokers report low-income and mental health problems relative to non-smokers. Low-income smokers may use smoking to alleviate negative emotional states resulting from exposure to multiple stressors. Yet, little work has been devoted to elucidating mechanisms that may explain the association between negative emotional states and smoking-related processes among low-income smokers. The present study sought to address this gap by examining anxiety sensitivity, a transdiagnostic factor related to both anxiety and smoking, as a potential mediator for the influence of anxiety symptoms on smoking-related processes, including threat-related smoking abstinence expectancies (somatic symptoms and harmful consequences), perceived barriers for cessation, and problems experienced during past quit attempts. Participants included treatment-seeking daily cigarette smokers ($n = 101$; 68.3% male; $M_{\text{age}} = 47.1$; $SD = 10.2$). Results indicated that anxiety symptoms exerted a significant indirect effect through anxiety sensitivity for threat-related smoking abstinence expectancies (somatic symptoms and harmful consequences), perceived barriers for cessation, and problems experienced during past quit attempts. The present results provide empirical support that anxiety sensitivity may be an underlying mechanism that partially explains the relation between anxiety symptoms and smoking processes among low-income treatment-seeking smokers. Findings broaden current theoretical understanding of pathways through which anxiety symptoms contribute to maladaptive smoking processes and cognitions among socioeconomically disadvantaged smokers.

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1. Introduction

More than 40 million adults in the United States (U.S.) are current smokers (Thorne, Malarcher, Maurice, & Caraballo, 2008). Smoking remains the leading cause of death and disability in the U.S. Between 2005 and 2009, smoking was responsible for over 480,000 premature deaths a year (Green, Beckham, Youssef, &

Elbogen, 2014). Smoking is the leading preventable cause of death in the U.S., and is causally related to 17 different types of cancer (IARC, 2012). Moreover, smoking causes 30% of all cancer deaths, with 90% of all lung cancer deaths causally attributable to smoking (U.S. Department of Health and Human Services (USDHHS), 2014). Although the prevalence of smoking has declined over the past 50 years, large disparities in tobacco use remain across a number of groups (Green et al., 2014), particularly disadvantaged populations. Perhaps most notably, the initiation and maintenance of smoking is twice as likely for individuals living at or below the poverty level than for those living above the poverty level (Thorne et al., 2008). Comparisons of smoking prevalence using National Health

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and Nutrition Examination Survey (NHANES) data for the past 25 years reveal a worsening gap between those at the lowest and highest income levels (Kanjiyal et al., 2006). Similarly, the prevalence of smoking among individuals living below poverty is 27.9% compared to 17% among those at or above poverty level (Morbidity & Mortality Weekly Report, 2014). Low income smokers therefore represent a major health disparity population in the US and available data indicate that their unique healthcare needs are not being met (Cuevas et al., 2014).

A major contributing factor to smoking among low SES persons is the increased exposure to multiple stressors associated with low SES environments (e.g., high urban stress), which in turn, contribute to disruptions in emotional processes (Reitzel, Kendzor et al., 2013; Reitzel, Lahoti et al., 2013), including emotion regulatory processes (Cuevas et al., 2014; Doan & Evans, 2011; Evans & Fuller-Rowell, 2013; Reitzel, Kendzor et al., 2013; Reitzel, Lahoti et al., 2013). Low SES individuals report more economic, employment-related, interpersonal, and transportation-related stressors than their higher SES counterparts (Businelle, Cuate, Kesh, Poonawalla, & Kendzor, 2013; Gallo & Matthews, 2003; Lantz, House, Mero, & Williams, 2005; Matthews, Flory, Muldoon, & Manuck, 2000; McLeod & Kessler, 1990). The neighborhoods in which low SES individuals live also contribute to greater relative exposure to stressful stimuli (Everson-Rose et al., 2011; Reitzel, Kendzor et al., 2013; Reitzel, Lahoti et al., 2013) and lower SES individuals often disproportionately suffer from psychological distress due to experienced stressors (Chen & Matthews, 2001; Cohen, Doyle, & Baum, 2006; Collins et al., 1998). Smokers living in neighborhoods with low social capital (Cohen, Finch, Bower, & Sastry, 2006), collective efficacy, (Bandura, 2000) and high economic disadvantage report greater tobacco dependence (Reitzel et al., 2012) and experience lower odds of cessation (Kendzor et al., 2012; Reitzel, Kendzor et al., 2013; Reitzel, Lahoti et al., 2013), potentially due to associated distress (Kendzor et al., 2010; Reitzel, Kendzor et al., 2013; Reitzel, Lahoti et al., 2013; Reitzel et al., 2011; Reitzel et al., 2010; Whembolua et al., 2012). Even when low SES individuals report fewer stressors, findings suggest that the stressors reported are more severe in nature (Grzywacz, Almeida, Neupert, & Ettner, 2004). Low SES has also been associated with greater engagement in maladaptive health behaviors to regulate stress (Jackson, Knight, & Rafferty, 2010; Businelle et al., 2010; Kendzor et al., 2009). Consequently, given the many stressors faced by low SES persons, smoking may function as a readily-available way to a regulate stress/negative affect. Additionally, this population is exposed to significantly more highly stressful environments, which may contribute to, exacerbate, or maintain chronically elevated negative affective disturbances (Haushofer & Fehr, 2014). Together, available data illustrate the close interconnection between low income smoking and negative affect as well as chronic stress.

Notably, mental health problems are disproportionately common among cigarette smokers in general, and a link between poor mental health and smoking persistence/inability to quit and remain abstinent is well-established (Cinciripini et al., 2010). As such, mental health problems are one possible factor that may be related to the stagnated rates of smoking prevalence in the United States (U.S.). For instance, among adults (at least 18 years old), smoking is more prevalent among those with, compared to those without, psychological disorders [39.1% versus 25.0%; (Substance Abuse and Mental Health Services Administration (SAMHSA), 2014)]. Findings from population-based studies indicate disproportionate rates of smoking among adults with psychological distress, whether measured dimensionally (Gfroerer et al., 2013; Kiviniemi, Orom, & Giovino, 2011; Lawrence, Hafekost, Hull, Mitrou, & Zubrick, 2013; Lawrence, Mitrou, & Zubrick, 2011; Leung, Gartner, Dobson, Lucke, & Hall, 2011; Taylor et al., 2014) or categorically (E. McClave, McKnight-Eily, Davis, & Dube, 2010; Substance Abuse and Mental

Health Services Administration (SAMHSA), 2014). Additionally, smokers with psychological distress smoke more heavily than those without psychological distress (Kiviniemi et al., 2011; Leung et al., 2011; McClave et al., 2010) and smoking prevalence increases with the number of comorbid psychological disorders (McClave et al., 2010), which presumably contribute to greater distress and lead to increases in smoking rates. Finally, numerous population-based studies have reported that adults with psychological distress exhibit less success in quitting and remaining abstinent than those without psychological distress (Carter, van der Deen, Wilson, & Blakely, 2014; Gfroerer et al., 2013; Kiviniemi et al., 2011; Lawrence et al., 2013, 2011; Leung et al., 2011; McClave et al., 2010; Substance Abuse and Mental Health Services Administration (SAMHSA), 2014; Taylor et al., 2014).

There has been increased recognition that anxiety and its disorders covary with smoking. Anxiety symptoms and psychopathology co-occurs with smoking at rates that exceed those found in non-psychiatric populations (Ziedonis et al., 2008). Lasser et al. (2000) found that current smoking rates for respondents with an anxiety disorder (past month or lifetime) were significantly greater than smoking rates among respondents with no mental illness. Reported rates of smoking were highest among individuals with panic-related problems and other anxiety disorders where panic attacks are common (e.g., social phobia, posttraumatic stress disorder [PTSD], generalized anxiety disorder; Lasser et al., 2000). Similar findings have been found by others (Hapke et al., 2005; Sonntag, Wittchen, Hofler, Kessler, & Stein, 2000). Moreover, the observed association between smoking and anxiety psychopathology does not appear to be due to sociodemographic characteristics, other psychiatric comorbidities, or symptom overlap in diagnostic criteria for anxiety disorders and nicotine dependence (Zvolensky & Schmidt, 2003). Numerous studies indicate anxiety disorders significantly impair cessation success (Hapke et al., 2005; Lasser et al., 2000; Zvolensky et al., 2008). For example, Piper and colleagues (Piper et al., 2010) examined the relation of psychiatric disorders to tobacco dependence and cessation outcomes on 1504 people making an aided smoking cessation attempt as part of a clinical trial. Six months after quitting, those ever diagnosed with an anxiety disorder had the lowest abstinence rates. These findings provide evidence that anxiety and its disorders are important in reducing the odds of successful quitting.

Despite the documented association between poverty and smoking, and anxiety and smoking-related processes, respectively, there is little understanding of anxiety processes among low-income smokers. Additionally, no work has examined possible mediators of the relations between anxiety states and smoking processes among low-income smokers. Anxiety sensitivity, defined as the extent to which individuals believe anxiety and anxiety-related sensations have harmful consequences (McNally, 2002), is one promising transdiagnostic candidate that may explain how anxiety contributes to smoking maintenance among low-income smokers. Anxiety sensitivity is a relatively stable individual difference variable that predisposes individuals to the development of anxiety/depressive problems (Taylor, 1999). Moreover, anxiety sensitivity significantly relates to avoidance-based response styles for coping with aversive events (Zvolensky & Forsyth, 2002) and is reliably correlated with smoking and other types of drug/alcohol use to reduce negative affect (Brown, Kahler, Zvolensky, Lejuez, & Ramsey, 2001; Novak, Burgess, Clark, Zvolensky, & Brown, 2003). Specifically, a wide range of studies have documented the role of anxiety sensitivity in aspects of smoking maintenance and relapse processes. For example, anxiety sensitivity is associated with the tendency to perceive quitting as more difficult (Zvolensky et al., 2007) and to expect periods of smoking deprivation or abstinence to be more stressful and personally threatening (Guillot, Leventhal, Raines, Zvolensky, & Schmidt, 2016; Langdon, Farris,

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