



Full length article

Gender differences in self-reported withdrawal symptoms and reducing or quitting smoking three years later: A prospective, longitudinal examination of U.S. adults



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ABSTRACT

Background: Little is known about gender differences in withdrawal symptoms among smokers in the community. This study used longitudinal epidemiologic data to examine gender differences in current smokers' report of withdrawal symptoms during past quit attempts and the relationship between withdrawal symptoms and the odds of reducing or quitting smoking three years later.

Methods: Data were drawn from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; Wave 1, 2001–2001, n = 43,093; Wave 2, 2004–2005, n = 34,653). Analyses were conducted on respondents who reported current daily cigarette smoking at Wave 1 (n = 6911). Withdrawal symptoms during past quit attempts were assessed at Wave 1. Current smoking status was assessed at Wave 2.

Results: Wave 1 current smoking women, compared to men, were more likely to endorse any withdrawal symptoms, withdrawal-related discomfort, and withdrawal-related relapse ($p < 0.0001$). Women endorsed a greater number of withdrawal symptoms than men ($M = 2.37$, $SE = 0.05$ versus $M = 1.78$, $SE = 0.04$; $p < 0.0001$). The odds of reducing and quitting smoking were significantly lower for respondents who reported any Wave 1 withdrawal symptoms, withdrawal-related discomfort, and withdrawal-related relapse. These relationships did not differ for women versus men. Among men, the odds of reducing smoking at Wave 2 decreased significantly with each cumulative withdrawal symptom compared to women (β interaction = 0.87; $p = 0.01$).

Conclusions: Women were more likely to report withdrawal while the relationship between withdrawal symptoms and decreased likelihood of reducing smoking was stronger in men. Identifying gender differences in withdrawal can help develop strategies to help reduce withdrawal for both men and women.

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1. Introduction

Most smoking quit attempts end in relapse to cigarette use within the first week (Piasecki, 2006) when withdrawal symptoms are the strongest (Piasecki et al., 2002). A number of laboratory and clinical studies have reported that women experience both a greater number and a wider variety of withdrawal symptoms

than men following either a quit attempt in clinical studies or a period of smoking abstinence in laboratory studies (Jorenby et al., 1995; Leventhal et al., 2007; Pang and Leventhal, 2013; Piasecki et al., 1998, 2003; Wetter et al., 1999a, 1999b). For example, in a laboratory study of 203 smokers (Leventhal et al., 2007), women reported greater increases in negative affect, withdrawal-related distress, and the urge to smoke to relieve withdrawal-related distress after 12 h of smoking abstinence. In another laboratory study, female smokers reported higher levels of overall negative affect and anxiety during abstinence than male smokers after 16 h of smoking abstinence (Pang and Leventhal, 2013). In a placebo-controlled clinical trial of transdermal nicotine patch and/or bupropion for smoking cessation, women displayed more day-to-day variability in withdrawal symptoms (Piasecki et al., 2003). Together, clini-

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cal and laboratory data suggest that men and women differ in their report of withdrawal symptoms. As the severity of withdrawal symptoms are strongly linked with smoking lapse after quit attempts (Piasecki, 2006), a better understanding of the experience of withdrawal for men and women, and the implications of gender differences in withdrawal for smoking abstinence, is warranted.

While past studies have examined gender differences in withdrawal within specific geographic communities and groups of smokers (e.g., treatment seeking smokers), little is known about gender differences in self-reported withdrawal symptoms using epidemiologic data that is more generalizable to the general population and that assesses smoking behavior over a lengthy period of time. Breslau et al. (1992) surveyed 1007 young adults (ages 21–30) who were members of a health maintenance organization in the metro Detroit area of the U.S. state of Michigan. Among the 241 participants who reported they had unsuccessfully attempted to quit or cut down on their smoking, there were no differences in the average number of withdrawal symptoms (range 0–12) by gender (men $M = 3.93$, $SD = 2.12$, women $M = 4.39$, $SD = 2.23$, $p = n.s.$). It is not yet known if there are gender differences in the report of withdrawal symptoms or withdrawal-related experiences (e.g., returning to smoking during a quit attempt to relieve withdrawal symptoms) in more recent samples that are nationally representative of the full U.S. adult population. In addition, it has not yet been examined whether gender differences exist in the association between self-reported withdrawal symptoms and continued smoking versus reducing or quitting smoking over a number of years.

The current study uses longitudinal epidemiologic data from the U.S. adult population to examine gender differences in withdrawal symptoms and the relationship between withdrawal symptoms reported by current daily smokers and the likelihood of reducing or quitting smoking three years later. The first aim of the study was to examine withdrawal symptoms for current daily smoking women versus men. Based on the laboratory and clinical research cited above (e.g., Leventhal et al., 2007), it was expected that current daily smoking women would be more likely to report withdrawal symptoms, withdrawal-related distress, and withdrawal-related relapse to smoking during past quit attempts than current daily smoking men. The second aim was to examine the relationship between self-report withdrawal symptoms during past quit attempts and reducing or quitting smoking three years later. Based on the relationship between withdrawal and smoking relapse (e.g., Piasecki, 2006), it was expected that the endorsement of withdrawal symptoms, withdrawal-related distress, and withdrawal-related relapse would be associated with a decreased likelihood of reducing and quitting smoking. The third aim was to explore whether gender differences existed in the relationship between self-reported withdrawal symptoms during past quit attempts and reducing or quitting smoking three years later.

2. Methods

2.1. Data source and study population

This study analyzed data from the National Institute on Alcohol Abuse and Alcoholism's National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; Wave 1, 2001–2002, $n = 43,093$; Wave 2, 2004–2005, $n = 34,653$). Participants were non-institutionalized U.S. civilian adults (ages 18 and older) in all 50 states and the District of Columbia. African-Americans, Hispanics, and young adults (ages 18–24) were oversampled. The response rate for the Wave 1 assessment was 81% and 86% of the eligible Wave 1 participants completed the Wave 2 assessment. Details of the NESARC, including the procedures related to data collection

and weighting, have been described in past publications (Grant and Kaplan, 2005; Grant et al., 2003b). The sample for the current analyses included participants who reported current daily cigarette smoking at the Wave 1 interview ($n = 6911$).

2.2. Material and methods

2.2.1. Smoking status. Smoking behavior was assessed at Wave 1 and Wave 2 using the Alcohol Use Disorders and Associated Disabilities Interview Schedule-DSM-IV (AUDADIS-IV; Grant et al., 2001, 2003a). Individuals were classified as Wave 1 current daily smokers, and included in the analytic sample, if they reported smoking cigarettes every day (i.e., seven days per week) during the past year at the Wave 1 assessment. Smoking status at Wave 2 was categorized into three mutually exclusive groups: current daily smokers (reported smoking every day in the past year at the Wave 2 assessment), current non-daily smokers (reported smoking some days in the past year at the Wave 2 assessment; range: 6 days/week – once a month or less), and current non-smokers (reported no smoking in the past year at the Wave 2 assessment).

2.2.2. Withdrawal symptoms. During the Wave 1 interview, participants were asked if they had experienced each of eight symptoms when attempting to quit smoking during the past 12 months: depression, sleep problems, difficulty in concentrating, increased appetite, irritability or frustration, anxiety or nervousness, heart beating more slowly, and restlessness. A response of Yes to each item was coded as a “1” while a response of No to each item was coded as a “0.” The cumulative number of symptoms ranged from 0 to 8. Participants were considered to have endorsed “any withdrawal symptoms” if they reported at least 1 withdrawal symptom. Participants were also asked to report whether withdrawal symptoms experienced over the past 12 months caused discomfort, distress, or impairment (“withdrawal-related discomfort”, Yes/No) and whether they used cigarettes to avoid withdrawal symptoms (“withdrawal-related relapse”, Yes/No).

2.2.3. Demographics. Wave 1 demographic information was categorized based on previous work (Grant et al., 2004) and included gender (male, female), age (18–29, 30–44, 45 and older), race/ethnicity (Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other, Hispanic), education (Less than High School, High School Graduate, Attended/Completed College), and marital status (Married or Living As Married, Not Married).

2.2.4. Psychiatric and substance use disorders. At Wave 1, the AUDADIS-IV assessed mood disorders (major depressive disorder, dysthymia, manic disorder, hypomanic disorder), anxiety disorders (panic disorder with or without agoraphobia, agoraphobia, social phobia, specific phobia, generalized anxiety disorder), alcohol use disorders (abuse and dependence), and substance use disorders (nicotine dependence; abuse and dependence of 10 classes of drugs: cannabis, sedatives, tranquilizers, opiates, heroin, stimulants, cocaine, hallucinogens, inhalants, solvents). Participants were classified into one of two mutually exclusive responses for each disorder category: (1) Lifetime Diagnosis (met criteria for a diagnosis at any point during the lifetime) or (2) Never Diagnosis (no lifetime diagnosis of the disorder).

2.3. Statistical analyses

All tests were completed in STATA using weighted analyses (StataCorp, 2011) to account for residual differences between the sample and the population profile according to the 2000 United States Population Census, as well as to account for nonresponse

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