



Short Communication

Predictors of quit attempts and successful quit attempts in a nationally representative sample of smokers



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HIGHLIGHTS

- We studied sociodemographic and clinical predictors of quit attempts.
- 40% of those with no previous attempts tried to quit over the next 3 years.
- 4.6% of those who previously tried to quit succeeded at the time of evaluation.
- Despite relatively high rates of quit attempts, rates of success are extremely low.

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ABSTRACT

Although most current smokers report that they would like to quit, most quit attempts fail suggesting that predictors of quitting attempts may differ from those of successful attempts. We examined sociodemographic and clinical predictors of quit attempts and successful quit attempts in a nationally representative sample of US adults. Data was collected in 2001–2002 (Wave 1) and 2004–2005 (Wave 2). Almost 40% of individuals who had not previously attempted to quit, tried to quit over the next three years; only 4.6% of those who tried had succeeded at the time of the evaluation. Hispanics, Asians, individuals with high income, and those with college education were less likely to attempt to quit, whereas those with daily nicotine use, younger age at first use and most symptoms of dependence were more likely to do so. Having an educational level below high school and older age at first nicotine use were predictors of successful quitting. Despite relatively high rates of quit attempts, rates of success are extremely low, indicating a gap between the public health need of decreasing tobacco use, and existing means to achieve it. Although there is a need to encourage people to quit tobacco, there may be an equally large need to develop more effective interventions that increase the rate of successful quit attempts.

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1. Introduction

Converging evidence indicates that tobacco use accounts for 12% of all deaths among adults globally and is the leading preventable cause of premature death worldwide (WHO, 2012). Tobacco use is associated with increased risk of cardiovascular disease, cancer, diseases of the respiratory tract, and other common diseases (US Department of Health & Human Services, 2010). In 2011, the approximate worldwide adult prevalence for daily tobacco smoking was 17% and for current tobacco smoking was 23% (WHO, 2011). In the same year, an estimated

19.3% of adults in the US were current tobacco smokers, out of which 21.8% smoked between 1 and 9 cigarettes per day and 8.3% smoked more than 30 cigarettes per day (King, Dube, Kaufmann, Shaw, & Pechacek, 2011). Although there is evidence indicating that the prevalence of daily smoking is decreasing (Secades et al., in press), the personal and societal costs of tobacco smoking in the US and worldwide are substantial (Hays, Ebbert, & Sood, 2009; WHO & Guindon, 2006).

Most current smokers report that they would like to quit and almost half have tried to quit during the previous 12 months (CDC, 2009). Unfortunately, most quit attempts fail (Malarcher, Dube, Shaw, Babb, & Kaufmann, 2011) suggesting that predictors of quitting attempts may differ from those of successful attempts (Borland et al., 2010; Zhou et al., 2009).

In clinical samples, which include smokers seeking treatment at outpatient and inpatient treatments, unsuccessful attempts have been related to the presence of withdrawal symptoms, higher levels of nicotine dependence (Hurt et al., 2002), female gender (Piper et al., 2010),

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younger age (Harris et al., 2004), history of past or current psychiatric disorders (Ziedonis et al., 2008), and lack of tobacco-related diseases (Azevedo & Fernandes, 2011). In general population samples, not being married (Derby, Lasater, Vass, Gonzalez, & Carleton, 1994) and lower socioeconomic status (SES) (Barbeau, Krieger, & Soobader, 2004) have been related to unsuccessful attempts to quit.

Some information on predictors of attempts and successful attempts is available from cross-sectional studies of community-based samples, such as the Minnesota Heart Health Program (Blake et al., 1989) and the Florida Tobacco Callback Survey (Davila et al., 2009), and also from cross-national studies such as the National Health Surveys from the US (Barbeau et al., 2004), the ITC-4 which includes representative samples of four countries (Borland, Partos, Yong, Cummings, & Hyland, 2011; Borland et al., 2010) and the ATTEMP cohort study, which includes samples of five countries (Zhou et al., 2009). These studies have reported that older age and lower SES predict quitting attempts, whereas male gender and lower nicotine dependence are reported predictors of successful attempts. However, these studies have focused on sociodemographic variables and as a result, information on clinical predictors of quit attempts and successful quit attempts is scarce.

We sought to build on previous findings by examining in a nationally representative sample of US adults, sociodemographic and clinical predictors of: 1) quit attempts and, 2) successful quit attempts. This information could help guide the development of interventions and policies focused on smoking cessation.

2. Methods

2.1. Sample and procedures

The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) (Grant et al., 2009; Grant, Stinson, et al., 2004) was the source of data. The NESARC target population at Wave 1 was the civilian non-institutionalized population 18 years and older residing in households and group quarters. Interviews were conducted between 2001 and 2002 with 43,093 participants (response rate of 81.0%) by trained interviewers (Grant et al., 2009; Grant, Stinson, et al., 2004). All procedures, including informed consent, received full human subjects review and approval from the US Census Bureau and the US Office of Management and Budget. The Wave 2 interview was conducted approximately 3 years later (2004–2005) and had a response rate of 86.7%, reflecting 34,653 completed interviews (Grant et al., 2009). As described previously, adjustment for non-response was successful, as the Wave 2 respondents and the original target population did not differ on age, race/ethnicity, gender, SES, or the presence of any substance, mood, anxiety, or personality disorder (Grant et al., 2009). Participants included in the present study were those with Wave 2 data and who were current tobacco users with no attempts to quit prior to Wave 1 ($n = 1868$).

2.2. Measures

The Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV) (Grant, Dawson, & Hasin, 2001), a structured diagnostic interview that includes computer algorithms to generate DSM-IV diagnoses, was used.

In order to build a comprehensive predictive model of quit attempts, we examined a broad range of sociodemographic, psychopathological, tobacco use-related variables and medical morbidity as assessed at baseline (i.e., Wave 1). Sociodemographic characteristics included were age, gender, race/ethnicity, past-year individual income, marital status, and level of education.

Past-year self-reported medical conditions included arteriosclerosis or hypertension, hepatic disease, cardiovascular disease, gastritis, arthritis, and stroke. Respondents were asked about these medical

conditions and whether the diagnosis had been confirmed by a physician. Axis I psychiatric disorders included substance use, mood, and anxiety disorders. Personality disorders assessed included paranoid, schizoid, antisocial, histrionic, avoidant, dependent and obsessive-compulsive personality disorders. The test-retest reliabilities for AUDADIS-IV diagnoses are fair to good for mood, anxiety, and personality disorders ($\kappa = 0.40$ – 0.62) and excellent for substance use disorders ($\kappa = 0.70$ – 0.91) (Grant et al., 2009; Hasin, Stinson, Ogburn, & Grant, 2007).

Assessment of tobacco use included daily use, age at first use of cigarettes, number of cigarettes per day, years of dependence, and DSM-IV diagnostic criteria of nicotine dependence (Grant et al., 2001).

2.3. Statistical analysis

First, we compared current smokers at Wave 1 who attempted to quit between Waves 1 and 2 versus those who did not attempt to quit. Second, among the respondents with attempts to quit, we compared those who continued smoking versus those who had successfully quit at Wave 2. For both analyses, unadjusted odds ratios (ORs) as well as 95% confidence intervals (95% CI) were obtained for sociodemographic characteristics, physical health conditions, psychiatric comorbidity and nicotine use variables. *T*-tests were used to compare continuous variables between groups. All analyses were weighted and estimated using SUDAAN (Research Triangle Park, 2007) to adjust for the design effects of the NESARC.

3. Results

3.1. Probability of quit attempts and successful quit attempts

Less than half (39.9%; $n = 746$) of smokers with no previous attempts to quit at Wave 1 attempted to quit between Waves 1 and 2. Furthermore, out of the 746 respondents that attempted to quit between Wave 1 and Wave 2, 712 were still smoking at Wave 2 assessment. That is, only approximately 4.6% of respondents who attempted to quit between the two waves were abstinent 3 years after the baseline assessment.

3.2. Predictors of quit attempts and successful quit attempts

Compared to Whites, Hispanics and Asians were significantly less likely to attempt to quit. Similarly, males were less likely than females to attempt to quit. Respondents with incomes higher than \$70,000 were less likely to attempt to quit than those with incomes less than \$20,000, whereas individuals with college education had decreased odds of trying to quit smoking than those who had lower educational attainment.

Several tobacco use-related characteristics predicted attempting to quit. Daily tobacco consumption and younger age at first tobacco use were associated to increased odds of attempting to quit. Odds were also increased if the respondents had developed tolerance, experienced withdrawal, smoked more than intended, spent a great deal of time in activities necessary to obtain nicotine, or had continued to smoke despite its adverse health consequences. Total number of symptoms of dependence also increased the odds of attempting to quit (Table 1). Surprising, by contrast, no medical conditions or psychiatric disorders predicted attempts to quit or successful quitting among those who attempted (data not shown).

The only significant predictors of successful quitting at Wave 2 was having an educational level below high school (ORs = 6.59; CI 95% = 1.25–34.69) and older age at first nicotine use ($t = 2.40$; $p < 0.05$).

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