



Published in final edited form as:

Am J Addict. 2009 ; 18(2): 140–147. doi:10.1080/10550490802544888.

Gender Differences in Associations between Lifetime Alcohol, Depression, Panic Disorder, and Posttraumatic Stress Disorder and Tobacco Withdrawal

Andrea H. Weinberger, PhD¹, Paul K. Maciejewski, PhD^{2,3}, Sherry A. McKee, PhD¹, Erin L. Reutenauer, BA¹, and Carolyn M. Mazure, PhD^{2,3}

¹ Substance Abuse Center, Department of Psychiatry, Yale University School of Medicine, New Haven, Connecticut

² Women's Health Research at Yale, New Haven, Connecticut

³ Department of Psychiatry, Yale University School of Medicine, New Haven, Connecticut

Abstract

This study examined the interaction of gender and lifetime psychiatric status on the experience of nicotine withdrawal using retrospective data from the National Comorbidity Survey (NCS; N = 816). Multiple regression analyses were performed to examine the main and interactive effects of gender and major depression, alcohol abuse/dependence, panic disorder, and PTSD on indices of withdrawal. Major depression and alcohol abuse/dependence were associated with longer duration of withdrawal symptoms in women. Women also showed stronger associations between major depression and recurrent withdrawal symptoms and PTSD and smoking relapse to alleviate withdrawal. Men showed a stronger association between alcohol abuse/dependence and smoking relapse to alleviate withdrawal. When developing and providing smoking cessation interventions, it is important to consider the gender-specific effects of lifetime psychiatric status on withdrawal.

INTRODUCTION

Smoking cessation interventions appear to be less successful with women than men. A number of studies have found lower quit rates for women,^{1,2} and women are less likely to maintain smoking cessation after treatment.³ Differential experience of nicotine withdrawal by men and women may be a reason for this difference in quit rates. A number of studies have examined gender effects in withdrawal symptoms; however, findings have been mixed, with some studies finding evidence of more severe withdrawal in women,^{4,5} and other studies failing to document such differences.^{6,7} It has been acknowledged that the relationship between gender and withdrawal symptoms is complicated by several potential moderating factors, including female reproductive status⁸ and menstrual cycle phase,⁹ as well as psychiatric status.¹⁰

Compared to other adult smokers, smokers with current or lifetime psychiatric disorders have significantly higher rates of smoking^{11,12} and nicotine dependence.¹³ Data from the National Comorbidity Survey (NCS) suggest that while approximately 22% of adults with no psychiatric disorders are current smokers, smoking rates are higher for adults with a lifetime diagnosis of major depression (36.6%), bipolar disorder (68.8%), non-affective psychosis (49.4%), alcohol abuse or dependence (43.5%), panic disorder (35.9%), and posttraumatic stress disorder

Address correspondence to Dr. Weinberger, Department of Psychiatry, Yale University School of Medicine, 34 Park Street, SAC, Room S-211, New Haven, CT 06519. andrea.weinberger@yale.edu.

(PTSD, 45.3%).¹¹ The rate of nicotine dependence in the general adult population has been reported to be 12.8%. Data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) suggest that much higher rates are found for smokers with current alcohol use disorders (34.5%) and current drug use disorders (52.4%) as well as smokers with current major depression (30%), bipolar disorder (35.3%), and panic disorder with and without agoraphobia (39.8% and 35.6%, respectively).¹³ In addition to reporting higher rates of smoking and nicotine dependence, smokers with psychiatric disorders have a more difficult time with smoking cessation. While 42.5% of adults in the general population report being able to quit smoking, rates are lower for adults with major depression (26%), bipolar disorder (25.9%), non-affective psychosis (0%), alcohol abuse or dependence (16.9%), drug abuse or dependence (22.4%), panic disorder (32.9%), and posttraumatic stress disorder (23.2%).¹¹ Overall, smokers with a variety of psychiatric disorders smoke at higher rates, show greater dependence on nicotine, and are less able to quit smoking.

It is well known that the prevalence rates of many psychiatric disorders differ by gender. In particular, women are more likely to meet diagnostic criteria for mood and anxiety disorders, whereas men are more likely to meet criteria for substance use disorders.¹⁴ Recent data now suggest that gender moderates the association between smoking and psychiatric diagnoses. Analyses of the NESARC data found that women with an alcohol use disorder¹⁵ or major depression¹⁶ were more likely to be daily smokers than men with either of these diagnoses.

Few research studies have examined the association of tobacco withdrawal and psychiatric illness. It has been suggested that symptoms of depression or anxiety are linked to more severe withdrawal symptoms for smokers.^{6,10,17-19} For example, patients with higher trait anxiety retrospectively report higher levels of withdrawal symptoms during smoking abstinence,¹⁹ and “high-depressed” smokers were more likely to report withdrawal symptoms than “low-depressed” smokers after three days of abstinence.¹⁰ Together, the available data suggest that smokers with psychiatric disorders, such as depression and anxiety, experience greater levels of withdrawal symptoms, which may result in difficulty maintaining smoking abstinence after a quit attempt.

Little research has examined withdrawal symptoms in smokers with alcohol or substance use disorders. Higher levels of withdrawal symptoms have been reported in one sample of smokers with alcohol dependence;²⁰ however, the authors acknowledge that this elevation may have been due to higher levels of nicotine dependence in this group as compared to non-alcohol dependent smokers. It is unclear at this time how drug and alcohol use disorders relate to the experience of nicotine withdrawal.

While some evidence suggests that smokers with psychiatric disorders experience greater levels of withdrawal symptoms, and that these disorders show differences in base rate by gender, the potential interaction of gender and diagnosis on tobacco withdrawal has received little research attention. The purpose of this study was to examine the interaction of psychiatric disorders and gender on the report of withdrawal symptoms and relapse to smoking due to withdrawal in a population-based sample of male and female smokers from the National Comorbidity Survey. The analyses focused on major depressive disorder, panic disorder, posttraumatic stress disorder, and alcohol abuse or dependence because of the prior research documenting relationships between these disorders and severity of withdrawal symptoms. Based on previous research, it was expected that smokers with lifetime reports of these four psychiatric disorders would report greater withdrawal symptoms than smokers without psychiatric disorders. The primary research question was to examine whether gender moderated the relationship between withdrawal symptoms and psychiatric disorders.

METHODS

Participants and Procedures

Data for this study were taken from the National Co-morbidity Survey (NCS).^{21,22} The purpose of the NCS was to examine the prevalence and correlation of psychiatric disorders in a non-institutionalized civilian population of the United States. A sample of 8098 persons aged 15 to 54 were surveyed between September 1990 and February 1992, with a response rate of 82.4%. Participants were selected from 1205 block-level segments in 176 counties throughout the United States using a stratified, multistage probability sampling plan. Questions about tobacco use were administered to a subsample of NCS participants (N = 4414) who were interviewed during the second half of the survey from 1991 to 1992. The baseline NCS was administered in face-to-face interviews by trained staff from the Survey Research Center at the University of Michigan. The current analyses were conducted on participants who were administered the NCS tobacco use supplemental survey and reported current tobacco use with at least one attempt to quit smoking that lasted at least two weeks (N = 816).

Measures

Psychiatric Diagnoses—A modified version of the Composite International Diagnostic Interview^{23,24} was administered to all participants. Diagnoses of major depression, alcohol abuse/dependence, panic disorder, and posttraumatic stress disorder (PTSD) were defined using the criteria found in the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised* (DSM-III-R).²⁵ Participants were considered to have a lifetime diagnosis of a disorder if they reported meeting criteria currently or at any time in their lives. A diagnosis of major depression included both single episode and recurrent depression. A diagnosis of panic disorder included panic disorder with and without agoraphobia.

Quit Attempt and Nicotine Withdrawal Questions

Number of Quit Attempts: Participants were asked to report the number of times that they quit or cut down their smoking or tobacco use for a period of at least two weeks.

Any Withdrawal Symptoms: Participants were asked whether they experienced any withdrawal symptoms during the first few days after a quit attempt. Participants were provided with a list of withdrawal symptoms (eg, headache, trouble sleeping, intense craving) and asked to respond affirmatively if they had experienced any symptom on the list (Yes/No).

Longest Period of Withdrawal: Participants were asked to report the longest number of days that they experienced withdrawal symptoms when cutting down or quitting smoking (number of days).

Any Recurring Withdrawal Symptoms: Participants were asked to report whether they experienced withdrawal symptoms during multiple quit attempts (Yes/No).

Relapse to Alleviate Withdrawal Symptoms: Participants were asked to report whether they ever began to smoke again after cutting down or quitting in order to relieve withdrawal symptoms (Yes/No).

Statistical Analyses

Demographic characteristics, lifetime psychiatric diagnoses, and smoking characteristics of male and female participants were compared using chi-square and t-test analyses. In order to have sufficient power to examine gender \times diagnosis interactions after restricting the sample to participants who were current smokers and who reported at least one previous attempt at

quitting, four disorders with high base rates that had been previously linked in published research to nicotine withdrawal were included in the analysis of withdrawal symptoms (major depressive disorder, panic disorder, posttraumatic stress disorder, alcohol abuse/dependence). Multiple regression analyses were performed to examine the main and interactive effects of gender and psychiatric co-morbidity on number of attempts to quit smoking and indices of tobacco withdrawal. Continuous outcome measures, number of quit attempts, and longest period (number of days) of withdrawal were analyzed using multiple linear regression after logarithmic transformations to reduce non-normality. Dichotomous outcome measures, withdrawal symptoms, recurrent withdrawal symptoms, and relapse to alleviate withdrawal symptoms, were analyzed using multiple logistic regression. Indicator variables representing the main effects of gender (coded 0 = male, 1 = female) and psychiatric diagnoses (coded 0 = no diagnosis of disorder, 1 = diagnosis of disorder) were also used to construct interactions between gender and psychiatric diagnoses. The regression models were constructed such that, in each case,

- the main effect of gender represents a gender difference in the outcome measure in the absence of psychiatric disorders included in the model,
- the main effect of each psychiatric disorder represents the effect of that disorder on the outcome measure in men, and
- each interaction of gender and psychiatric disorder represents a gender difference in the effect of that disorder on the outcome measure (ie, the effect of the disorder in women *relative to* the effect of the disorder in men).

Regression analyses were adjusted for demographic variables, nicotine dependence (represented by a dichotomous variable indicating reported smoking of a maximum of 10 or more cigarettes per day), and number of quit attempts. All statistical analyses were performed using a sample weight variable provided with the NCS data rescaled to the sample size (N = 816) of the present study.

RESULTS

Demographic and Smoking Variables

Demographic Variables—Of the 4414 adults administered the NCS tobacco supplemental survey, 18.5% reported that they were current smokers with at least one past attempt at smoking cessation lasting at least two weeks. Participants (N = 816, 57% female) did not differ by gender on age, race, income, or years of education (see Table 1). Male participants were more likely to report their marital status as “never married” and less likely to report that they were divorced or separated than female participants.

Rates of Psychiatric Disorders—Approximately one-quarter of the sample reported a history of alcohol abuse or dependence (30.1%) or major depression (23.4%). A smaller number of participants reported a history of anxiety disorders (panic disorder, 4.5%; post-traumatic stress disorder, 11.0%). Women were more likely to report a history of major depression, panic disorder, and PTSD, and less likely to report a history of alcohol abuse or dependence than men (see Table 2).

Characteristics of Quit Attempts among Current Smokers—Male and female smokers did not differ on their number of quit attempts (women: M = 4.3, SD = 6.6; men: M = 4.9, SD = 8.0; $p > 0.05$) nor on any of the withdrawal questions ($p > 0.05$). An equal proportion of men and women reported that they experienced withdrawal symptoms during a smoking cessation attempt (women, 68.0%; men, 67.7%) and that they relapsed to smoking as a way to relieve their withdrawal symptoms (women, 60.1%; men, 58.7%).

Analysis of Gender and Psychiatric Comorbidity Interactions on Quit Attempts and Indices of Withdrawal

Number of Quit Attempts: There were no significant main effects or interactions for the number of attempts to quit smoking reported by participants (see Table 3). The reported number of lifetime quit attempts did not differ by gender or psychiatric diagnosis.

Longest Period of Withdrawal: There were significant gender \times diagnosis interactions for major depressive disorder ($p < 0.05$) and lifetime alcohol abuse/dependence ($p < 0.05$). Histories of major depression and of alcohol abuse/dependence were associated with reports of longer lengths of time experiencing withdrawal symptoms and to a greater extent in women compared to men. The gender \times diagnosis interaction was not significant for panic disorder or PTSD.

Any Withdrawal Symptoms: There was a main effect of diagnosis for lifetime alcohol abuse/dependence for reporting the presence of withdrawal symptoms when attempting smoking cessation (see Table 4). This result suggests that participants with a history of alcohol use disorders were approximately 2.5 times more likely to report experiencing withdrawal symptoms than participants without these diagnoses. Gender \times diagnosis interactions were not significant for any disorder.

Any Recurring Withdrawal Symptoms: There was a significant main effect of diagnosis for smokers with lifetime panic disorder. Smokers with a lifetime diagnosis of panic disorder were greater than three times more likely to report withdrawal symptoms during multiple attempts to quit smoking than smokers without this diagnosis. There was also a significant interaction of gender by diagnosis for lifetime major depressive disorder. The odds ratio between history of depression and reports of repeated withdrawal symptoms was approximately 2.7 times greater in women as compared to men.

Relapse to Alleviate Withdrawal Symptoms: There was a significant main effect for the diagnosis of lifetime major depressive disorder, indicating that smokers with a history of major depression were 2.5 times more likely than those without this diagnosis to report smoking again in order to relieve withdrawal symptoms. There was a significant gender \times diagnosis interaction for alcohol abuse/dependence, such that odds ratios between alcohol abuse/dependence and reports of relapse to alleviate withdrawal symptoms were approximately 2.5 times greater in men as compared to women. The main effect of PTSD and its interaction with gender were both significantly associated with relapse to alleviate symptoms of withdrawal. Male smokers with a history of PTSD were four times less likely than men without this diagnosis to report relapsing to smoking to relieve withdrawal symptoms. Odds ratios between PTSD and reports of relapse to alleviate withdrawal symptoms were nearly five times greater in women as compared to men.

DISCUSSION

Previous research has suggested that nicotine withdrawal symptoms differ for smokers with symptoms of psychiatric disorders such as depression and anxiety.^{6,10} It was predicted that withdrawal would differ by psychiatric diagnoses; however, the relationship between psychiatric diagnoses and the longest period of withdrawal, report of recurrent withdrawal symptoms, and relapse to smoking due to withdrawal was moderated in many cases by gender. Contrary to expectation, smokers in the present study did not differ in their report of ever experiencing withdrawal symptoms by gender or psychiatric status. While differences were not found for the overall experience of withdrawal symptoms, other aspects of the experience of nicotine withdrawal did differ by psychiatric status and gender. Associations between major depression and reports of longer periods of withdrawal and associations between major

depression and recurrent withdrawal symptoms were greater in women as compared to men. Gender not only moderated associations between some psychiatric diagnoses and the experience of withdrawal symptoms, but also associations between some psychiatric diagnoses and relapse behavior. As compared to men, the association between PTSD and reports of relapse to smoking due to withdrawal symptoms was substantially greater in women. As compared to women, the association between diagnosed alcohol abuse/dependence and reports of relapse to smoking due to withdrawal symptoms was substantially greater in men. Women are less likely than men to report lifetime alcohol abuse or dependence; however, the association between a history of alcohol abuse/dependence and reports of longer periods of withdrawal was stronger in women as compared to men. Overall, the results of the present study suggest that relationships between psychiatric disorders such as PTSD and alcohol abuse/dependence and greater difficulty with nicotine withdrawal are stronger in women as compared to men.

Women in general have more difficulty quitting smoking than men.^{26,27} While there were no main effects of gender demonstrated in the present study, interactions between psychiatric diagnoses and gender inform our understanding of the increased difficulty that female smokers have in quitting smoking and maintaining smoking abstinence. For example, Levine and colleagues²⁸ found that while smoking abstinence rates between women with and without a history of depression did not differ, women with a history of depression were more likely to drop out of smoking cessation treatment, and depressive symptoms during treatment were associated with poorer outcomes. A second study²⁹ found that smokers with higher levels of depression were less likely to set a quit date than those with lower levels of depression. Women with psychiatric disorders have more difficulty initiating and maintaining smoking cessation, possibly due to increased severity of withdrawal symptoms. Research needs to clarify why female smokers and smokers with psychiatric disorders have more difficulty with tobacco withdrawal and quitting smoking.

Previous analyses of the NCS¹¹ suggest that adults with psychiatric disorders have lower quit rates than other adults, yet our analyses did not find any difference in the number of quit attempts by psychiatric disorder. Lasser et al.¹¹ defined quit rates using the number of past smokers who had been abstinent for at least a year and did not examine differences in the number of quit attempts. Our sample included only current smokers who had an attempt to quit smoking within the previous year. The selection of this subsample of smokers may have reduced the variability in the number of attempts to quit smoking. In our sample, differences in the experience of withdrawal other than number of quit attempts were found to be more influenced by gender and psychiatric disorders.

The current study has limitations inherent in its use of the NCS data. Because withdrawal symptoms were assessed retrospectively, it is possible that certain groups of smokers (eg, women with a lifetime history of major depression) have a bias to recall withdrawal symptoms as being more severe than do other groups of smokers. It is also possible that smokers familiar with withdrawal symptoms from other substances of abuse (eg, women with a lifetime history of alcohol abuse or dependence) are better able to recognize and report withdrawal symptoms for nicotine. Pomerleau et al.³⁰ found no gender differences in prospective reports of smoking withdrawal symptoms, but significant gender differences in retrospective reports that suggest men underestimate withdrawal symptoms. In the present study, there were no overall gender differences in reported symptoms of smoking withdrawal, contrary to Pomerleau et al.'s finding that men as compared to women report substantially fewer withdrawal symptoms retrospectively. Regardless of how retrospectively assessed withdrawal symptoms would compare with prospectively assessed withdrawal symptoms among subgroups of smokers, subjective views of past withdrawal symptoms could exert a powerful influence on smokers' motivation and self-efficacy to make future attempts to quit. For example, smokers who

remember longer, more severe periods of withdrawal may be less likely to want to make an attempt in the future or may be less confident about their ability to succeed at cessation when entering a new attempt. As a result, these groups of smokers may require an additional emphasis on strategies to increase self-efficacy, motivation, and preparation to cope with cravings and withdrawal.

As a second limitation, the NCS sample was restricted to current smokers who had attempted to quit smoking during their lifetime with at least one attempt lasting a minimum of two weeks. It is unknown how the experience of withdrawal would differ by gender and psychiatric diagnoses for smokers who were excluded because they were unable to maintain abstinence for two weeks. It would be useful to examine how gender and psychiatric diagnoses relate to smoking relapse during the first weeks of abstinence, when withdrawal symptoms may be at their most severe. In addition, information about the level of psychiatric symptom severity and severity of alcohol abuse/dependence would be useful to understand the relationship between psychiatric symptoms and quit attempts. Similarly, knowing the utilization of treatment for psychiatric symptoms and attempts at quitting alcohol use during smoking cessation attempts would be important information for future examinations of the experience of withdrawal and smoking cessation. The analyses in this study were limited to psychiatric diagnoses with a high co-morbidity for smoking and gender differences in base rates. While other disorders have also been linked to high rates of smoking (eg, schizophrenia, bipolar disorder), their low base rates precluded these types of analyses. Findings may not generalize to smokers with other psychiatric disorders, which would be an important area for future research.

Nonetheless, several strengths of this study are related to the National Comorbidity Survey data. The NCS is a nationally representative database with a thorough assessment of Axis I disorders and a large sample of smokers. Although the data from the NCS were collected in the early 1990s, the NCS contains multiple questions about nicotine withdrawal experiences that are unavailable in other more recent epidemiological datasets.

Our results indicate that gender moderates the impact of psychiatric diagnoses on some experiences of withdrawal symptoms during a quit attempt and on relapse to smoking due to withdrawal symptoms. It appears that female smokers with psychiatric disorders have a more difficult time with smoking cessation than male smokers, and it is important to continue to improve interventions with these populations. Information about the nature of withdrawal symptoms and the relationship between withdrawal and relapse can provide insights for tailoring interventions toward groups of smokers who have a more difficult time quitting. For example, women with major depression and alcohol abuse/dependence who experience longer periods of withdrawal symptoms when quitting smoking may need treatments that are longer in duration (behavioral and pharmacological) and focus throughout the course of treatment on education about withdrawal (eg, potential duration of withdrawal symptoms) and motivational enhancement strategies. Smokers who are more likely to report lapsing to smoking to cope with withdrawal symptoms (eg, adults with major depression) may also need longer periods of treatment aimed at maintaining motivation to quit and to work on issues related to relapse prevention. Considering both gender and psychiatric status in designing and implementing cessation treatments may address specific barriers to quitting that will improve smoking cessation outcomes.

Acknowledgments

This work was supported in part by grants K12-DA-000167 (Dr. Weinberger) and P50-AA015632 (Dr. Mazure) from the National Institutes on Health, Bethesda, Md.; Women's Health Research at Yale; and the State of Connecticut, Department of Mental Health and Addiction Services. The NCS is funded by the National Institute of Mental Health (grants R01 MH/DA46376 and R01 MH49098), the National Institute of Drug Abuse (through a supplement to R01 MH/DA46376), and the W. T. Grant Foundation (grant 90135190).

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Demographic characteristics of current smokers who have attempted to quit smoking (N = 816)

TABLE 1

Variable	Category	Full sample (N _w = 816)	Women (N _w = 465)	Men (N _m = 351)	Women vs. men χ^2 (df)
Age	15–24 years	14.8%	14.1%	15.8%	3.42 (3)
	25–34 years	36.8%	38.8%	34.1%	
	35–44 years	29.9%	27.8%	32.5%	
	45–54 years	18.5%	19.3%	17.6%	
Race	White	79.0%	79.0%	78.9%	1.62 (3)
	Black	9.8%	9.6%	10.2%	
	Hispanic	8.0%	8.8%	7.1%	
	Other	3.2%	2.7%	3.9%	
Income	Under \$20,000	30.5%	31.8%	28.8%	2.07 (3)
	\$20,000–\$34,999	28.4%	28.8%	28.0%	
	\$35,000–\$69,999	30.0%	29.5%	30.7%	
Education	More than \$70,000	11.1%	9.9%	12.6%	
	Under 12 years	23.1%	23.8%	22.2%	6.08 (3)
	12 years	47.4%	49.0%	45.3%	
Marital status	13–15 years	19.9%	19.8%	20.1%	
	Over 15 years	9.6%	7.4%	12.4%	
	Married/cohabitating	67.4%	65.9%	69.5%	11.13 (2)*
Never married	Divorced/separated/widowed	15.3%	18.7%	10.7%	
	Never married	17.3%	15.4%	19.8%	

* $p < 0.01$.

TABLE 2

Rates of psychiatric diagnoses among current smokers who have attempted to quit smoking (N = 816)

Variable	Full sample (N _w = 816)	Women (N _w = 465)	Men (N _w = 351)	Women vs. men adjusted OR [*]
Lifetime major depression	23.4%	26.9%	18.9%	1.59 [†]
Lifetime alcohol abuse/dependence	30.1%	22.9%	39.7%	0.46 [‡]
Lifetime panic disorder	4.8%	6.8%	2.1%	3.36 [†]
Lifetime PTSD	11.0%	13.8%	7.3%	1.94 [†]

* Adjusted for marital status

[†] $p < 0.01$;[‡] $p < 0.001$

PTSD = posttraumatic stress disorder

TABLE 3

Multiple linear regression models for logarithm of number of attempts to quit smoking and longest period of abstinence

Independent variable	Number of attempts to quit smoking (N = 816), adjusted estimates*		Longest period of withdrawal (N = 516), adjusted estimates [†]	
	B (SE)	t (df = 791)	B (SE)	t (df = 490)
Gender	0.02 (0.08)	0.30	-0.26 (0.14)	-1.84
Lifetime major depressive disorder [‡]	0.13 (0.13)	1.01	0.04 (0.21)	0.19
Gender × lifetime major depressive disorder [§]	-0.14 (0.16)	-0.87	0.56 (0.26)	2.11//
Lifetime alcohol abuse/dependence [‡]	-0.06 (0.10)	-0.66	-0.17 (0.16)	-1.06
Gender × lifetime alcohol abuse/dependence [‡]	0.06 (0.14)	0.46	0.51 (0.23)	2.23//
Lifetime panic disorder [‡]	0.17 (0.34)	0.51	-0.25 (0.68)	-0.37
Gender × lifetime panic disorder [§]	-0.02 (0.38)	-0.04	0.00 (0.73)	-0.01
Lifetime PTSD [‡]	0.09 (0.20)	0.45	0.00 (0.33)	0.00
Gender × lifetime PTSD [§]	-0.07 (0.23)	-0.31	-0.07 (0.38)	-0.19

* Adjusted for demographic variables (see Table 1) and nicotine dependence.

[†] Adjusted for demographic variables (see Table 1), nicotine dependence, and number of attempts to quit.

[‡] Main effect term represents the effect of psychiatric disorder in males.

[§] Interaction term represents the effect of psychiatric disorder in females relative to effect of psychiatric disorder in males.

// $p < 0.05$.

Abbreviation: PTSD = posttraumatic stress disorder.

TABLE 4

Multiple logistic regression models for any withdrawal symptoms, any recurrent withdrawal symptoms, and relapse to alleviate withdrawal symptoms

Independent variable	Any withdrawal symptoms (N = 815), adjusted estimates*		Any recurrent withdrawal symptoms (N = 527), adjusted estimates*		Relapse to alleviate withdrawal symptoms (N=527), adjusted estimates*	
	B (SE)	OR	B (SE)	OR	B (SE)	OR
Gender	0.08 (0.20)	1.08	-0.44 (0.26)	0.64	0.40 (0.26)	1.50
Lifetime major depressive disorder [†]	0.11 (0.36)	1.11	0.04 (0.40)	1.04	0.93 (0.43)	2.53//
Gender × lifetime major depressive disorder [‡]	0.57 (0.46)	1.77	1.00 (0.51)	2.71//	-0.30 (0.52)	0.74
Lifetime alcohol abuse/dependence [‡]	1.02 (0.28)	2.78 [#]	0.49 (0.30)	1.64	0.49 (0.30)	1.64
Gender × lifetime alcohol abuse/dependence [§]	-0.30 (0.41)	0.74	0.15 (0.44)	1.16	-0.95 (0.42)	0.39//
Lifetime panic disorder [†]	-1.08 (0.89)	0.34	1.15 (0.57)	3.17//	-0.56 (1.26)	0.57
Gender × lifetime panic disorder [‡]	1.56 (1.04)	3.89	—	—	-0.31 (1.34)	0.73
Lifetime PTSD [†]	0.25 (0.55)	1.28	-0.82 (0.60)	0.44	-1.40 (0.63)	0.25//
Gender × lifetime PTSD [‡]	0.66 (0.68)	1.94	0.61 (0.71)	1.84	1.58 (0.72)	4.85//

* Adjusted for demographic variables (listed in Table 1), nicotine dependence, and number of attempts to quit.

[†] Could not be estimated for any recurrent withdrawal symptoms.

[‡] Main effect term represents the effect of psychiatric disorder in males [except for the effect of panic disorder (PD) on any recurrent withdrawal symptoms, for which the main effect of PD represents the effect of PD irrespective of gender due to the fact that no term representing a gender × PD interaction was included in the model for any recurrent withdrawal symptoms].

[§] Interaction term represents the effect of psychiatric disorder in females relative to effect of psychiatric disorder in males

// $p < 0.05$;

$p < 0.001$.

Abbreviation: PTSD = posttraumatic stress disorder.