Gender Differences in Cannabis Use Disorders: Results from the National Epidemiologic Survey of Alcohol and Related Conditions

Sharaf S. Khan[a], **Roberto Secades-Villa**[a,b], **Mayumi Okuda**[a], **Shuai Wang**[a], **Gabriela Pérez-Fuentes**[a], **Bradley T. Kerridge**[c], and **Carlos Blanco**[a]

[a]Department of Psychiatry, Columbia University/New York State Psychiatric Institute, 1051 Riverside Drive, Unit 69, New York, NY, 10032, USA

[b]Department of Psychology, University of Oviedo, Plaza Feijoo, s/n, 33003 Oviedo, Spain

[c]Department of Epidemiology and Biostatistics, School of Public Health, University of Maryland, College Park, Maryland 20742

Abstract

Background—To examine gender differences among individuals diagnosed with DSM-IV lifetime cannabis use disorder (CUD).

Methods—A nationally representative sample of U.S. adults aged 18 years or older that were diagnosed with lifetime CUD (N= 3,297): Men (N = 2,080), Women (N = 1,217). Data were drawn from the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC, n = 43,093). The survey response rate was 81%.

Results—Nearly all individuals with CUD had a psychiatric comorbidity (95.6% of men, 94.1% of women). Men with lifetime CUD were more likely than women to be diagnosed with any psychiatric disorder, any substance use disorder and antisocial personality disorder, whereas women with CUD had more mood and anxiety disorders. After adjusting for gender differences in sociodemographic correlates and the prevalence of psychiatric disorders in the general population, women with CUD were at greater risk for externalizing disorders. Men with CUD met more criteria for cannabis abuse, had longer episodes of CUD, smoked more joints, and were older at remission when compared to women with CUD. Women experienced telescoping to CUD. Treatment-seeking rates were very low for both genders, and there were no gender differences in types of services used or reasons for not seeking treatment.

Conclusions—There are important gender differences in the clinical characteristics and psychiatric comorbidities among individuals with CUD.

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Contributors
Blanco C designed the study, Khan S and Secades-Villa R managed the literature searches and wrote the first draft of the manuscript. Wang S conducted the statistical analyses. All authors contributed to and have approved the final manuscript.

Conflict of Interest
No conflict declared.

1. INTRODUCTION

Cannabis is the most widely used illicit substance in the world (Australian Institute of Health and Welfare, 2003; Copeland et al., 2001; Donnelly and Hall, 1994; European Monitoring Center for Drugs and Drug Addiction, 2003), and is the drug with the highest rate of abuse or dependence in the U.S. (Substance Abuse and Mental Health Services Administration, 2009). About 11.8% of men and 5.4% of women meet criteria for a lifetime cannabis use disorder (CUD; Stinson et al., 2006). CUD is associated with lower educational attainment (Gruber et al., 2003), increased violence (Arseneault et al., 2000), high healthcare costs (Pacula, 2005), and many other personal and societal consequences. Despite the increasing prevalence of CUD (Compton et al., 2004), the gender differences among individuals with this disorder remain poorly characterized. Most data available on gender differences in CUD is derived largely from clinical samples (Crowley et al., 1998; Stephens et al., 1993; Westermeyer and Boedicker, 2000), yielding results that may not extrapolate to the general population of individuals with CUD. Important questions remain regarding the gender differences in psychiatric comorbidities, clinical course, and treatment-seeking patterns among individuals with CUD.

First, gender differences between CUD and psychiatric comorbidities have been largely unexplored. Previous work has shown that 90% of individuals with lifetime cannabis dependence have comorbid psychiatric disorders (Agosti et al., 2002) and that women with CUD are more likely to meet criteria for major depression when compared to men with CUD (Grant, 1995). However, to our knowledge, gender differences in psychiatric comorbidity among individuals with CUD have otherwise not been described. Furthermore, no study has examined whether CUD moderates the relationship between gender and psychiatric comorbidity, and as a result, little information exists on whether CUD increases the risk of specific comorbidities across genders.

Second, it is also unknown whether the clinical course of CUD varies between men and women. The first use of cannabis and highest risk of cannabis dependence occurs around late adolescence (Degenhardt et al., 2008; Wagner and Anthony, 2002), while use of cannabis tends to decline in the late 20s (Coffey et al., 2000; Kandel and Davies, 1992). Few epidemiological studies have examined whether there are any gender differences in these milestones, or in the severity of CUD. Few investigations have examined whether women have an accelerated progression from first use of cannabis to a CUD. This accelerated progression across the landmark stages of substance use disorders has been termed a "telescoping effect," and has been reported in clinical samples of individuals with alcohol dependence (Randall et al., 1999) and clinical (Ibanez et al., 2003; Tavares et al., 2003) and epidemiological (Blanco et al., 2006) samples of pathological gambling. To date, only two studies have investigated whether telescoping occurs in cannabis dependence (Ehlers et al., 2010; Hernandez-Avila et al., 2004). While both studies found evidence for the telescoping phenomenon for cannabis dependence, they both had relatively small samples.

Finally, little is known about the gender differences in treatment-seeking behaviors among individuals with CUD. The admission rate for cannabis problems has increased by 32% from 1996 to 2006 for the U.S. (Substance Abuse and Mental Health Services Administration, 2008) In addition, cannabis accounted for 16% of all treatment admissions in 2006, and was the most common illicit drug responsible for treatment admissions that

year (Substance Abuse and Mental Health Services Administration, 2008). Despite this a reported increase in treatment admission rates, treatment-seeking for CUD appears to be low, and no data is available on reasons for not seeking treatment by gender.

Our study aims to extend prior investigations on the gender differences among men and women with CUD by drawing on a large, nationally representative epidemiologic study, the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; N=43,093). The specific goals of this study are: 1) to compare the rates and patterns of psychiatric comorbidity among men and women with CUD; 2) to examine gender differences in the course and clinical presentation among men and women with CUD; and 3) to investigate gender differences in treatment seeking patterns among men and women with CUD.

2. METHODS

2.1. Sample

The 2001–2002 NESARC is based on a U.S. representative sample that has been described in detail elsewhere (Grant et al., 2004). The target population was the civilian noninstitutionalized U.S. population, included those residing in households and group quarters that were aged 18 years and older. Face-to-face interviews were conducted with 43,093 respondents by professional interviewers from the U.S. Census Bureau. The survey response rate was 81%. Blacks, Hispanics, and young adults (ages 18–24 years) were oversampled, and data were adjusted for oversampling and nonresponse. The weighted data were then adjusted to represent the U.S. civilian population based on the 2000 census (Grant et al., 2005, 2006, 2004). The sample for this study was composed of men (N = 2,080) and women (N = 1,217) with lifetime cannabis use disorders (i.e., cannabis abuse, dependence or both).

2.2. Measures

Sociodemographic measures included gender, race/ethnicity, nativity, age, education, personal income, employment status, marital status, place of residence, region of the country, and insurance type.

The diagnostic interview was the Alcohol Use Disorder and Associated Disabilities Interview Schedule–DSM-IV Version (AUDADIS-IV) (Grant et al., 2001, 2004). The AUDADIS-IV includes an extensive list of symptom questions that operationalize each DSM-IV criteria for cannabis abuse and dependence separately. Each criterion for DSM-IV cannabis abuse was rated independently of whether or not dependence was present, allowing the identification of cannabis-dependent individuals with and without abuse (Hasin et al., 2005b). The high reliability and validity of the AUDADIS substance use disorder diagnoses are well documented (Canino et al., 1999; Compton et al., 2004; Cottler et al., 1997; Chatterji et al., 1997; Grant, 1995; Hasin et al., 2003; Nelson et al., 1999).

Mood disorders included DSM-IV primary major depressive disorder (MDD), bipolar I, bipolar II, and dysthymia. Anxiety disorders included panic disorder, social anxiety disorder, specific phobias, and generalized anxiety disorder. Personality disorders included DSM-IV avoidant, dependent, obsessive-compulsive, paranoid, schizoid, and antisocial personality disorders. The test-retest reliability for AUDADIS-IV mood, anxiety, and personality diagnoses in the general population and in clinical settings was fair to good (K=0.40–0.62; Hasin et al., 2003).

Measures of the clinical course of CUD included age at first use of cannabis, age of onset at heavy use (defined as daily use or use in more than 20 days/month), age at onset of the CUD, total number of episodes of the CUD, total number of diagnostic criteria met, duration

of the longest episode, the percentage of individuals who remitted from the disorder, and the age at remission. The mean number of episodes of cannabis abuse, and the mean number of criteria met for cannabis abuse was assessed only among individuals with cannabis abuse whereas the mean number of episodes of cannabis dependence, and the mean number of criteria met for cannabis dependence was assessed among individuals with cannabis dependence with or without a diagnosis of cannabis abuse. Telescoping was assessed by measuring the time elapsed from age at first use to the age at onset of CUD.

Consistent with other reports (Kessler et al., 2005), we divided treatment-seeking into professional treatment and non-traditional treatment (treatment provided by human service professionals) among individuals who sought treatment. Professional treatment included: (1) outpatient visits to a physician, psychologist, or any other professional; (2) inpatient treatment in a drug detoxification or rehabilitation unit, or hospital ward; and (3) treatment in an emergency department. Human service professionals included members of the clergy, employee assistance programs, family and social services, halfway houses, therapeutic communities, crisis centers, and self-help groups.

Among individuals with CUD who did not seek treatment, we compiled reasons for not seeking help into four categories: 1) logistical barriers (e.g., financial difficulties, lack of time); 2) lack of motivation (e.g., wanted to keep using cannabis); 3) social stigma (e.g., was embarrassed by the problem); and 4) low perceived need (e.g., thought that treatment was not necessary because they already handled the problem).

2.3. Statistical Analyses

Weighted percentages and means were computed to determine gender differences in the sociodemographic correlates, prevalence of psychiatric comorbidities, clinical course and characteristics, and treatment-seeking behaviors among respondents with lifetime DSM-IV CUD. Logistic regression analyses yielded odds ratios (ORs), indicating measures of association among: 1) Lifetime CUD and sociodemographic characteristics; 2) Lifetime CUD and psychiatric comorbidities; and 3) Lifetime CUD and treatment-seeking behaviors.

To ensure that gender differences in the risk of psychiatric comorbidities were not due to sociodemographic correlates or to gender differences in the distribution of psychiatric disorders in the general population, the association between gender, CUD, and comorbidity was examined using additional logistic regression models. These logistic regression models used each psychiatric disorder as the outcome variable, and included gender, lifetime CUD and their interaction as predictor variables. These models also adjusted for sociodemographic characteristics.

Due to the cross-sectional nature of the study, both unadjusted and adjusted ORs are used as measures of association without implying any causal association. We consider two percentages to be different if the 95% confidence interval of their ORs does not include 1.0 (Agresti and Min, 2002). All standard errors were estimated using SUDAAN to adjust for the design characteristics of the NESARC. Females (and individuals without CUD, when modeling interactions) were considered the reference group for all analyses.

3. RESULTS

3.1. Sociodemographic Characteristics

Previous data from the NESARC estimates that 11.8% of men and 5.4% of women meet criteria for a lifetime cannabis use disorder (CUD; Stinson et al., 2006). Table 1 shows that men with CUD were more likely than women to be older than 45 years (OR= 1.66, 95% CI = 1.34–2.06), to have a high school education or less, and to have an income above $20,000.

Men were significantly less likely to be unemployed (OR= 0.53, 95% CI = 0.44–0.63) and widowed/divorced (OR=0.71, 95% CI = 0.58–0.88; Table 1).

3.2. Psychiatric Comorbidity

Among individuals with lifetime CUD, nearly 95% of both men and women met criteria for at least one other psychiatric disorder. After adjusting for sociodemographic correlates, men with CUD were significantly more likely than women to have any psychiatric disorder (OR = 1.25, 95% CI = 1.19–1.31), any Axis I disorder (OR=1.26, 95% CI = 1.19–1.32), any substance use disorder (OR = 2.18, 95% CI = 2.06–2.31), any alcohol use disorder (OR=2.90, 95% CI=2.72–3.09), any drug use disorder (OR=1.27, 95% CI=1.07–1.51) , conduct disorder (OR=2.62, 95% CI =2.05–3.36), pathological gambling (OR=3.07, 95% CI = 2.10–4.49), and antisocial personality disorder (OR=2.99, 95% CI = 2.49–3.59). Men with CUD were significantly less likely to have all mood and anxiety disorders, and avoidant (OR=0.58, 95% CI=0.48–0.71), dependent (OR=0.41, 95% CI = 0.25–0.66), and paranoid personality disorders (OR = 0.67, 95% CI = 0.58–0.77).

As indicated by the gender by CUD interaction, after adjusting for gender differences in sociodemographic characteristics and in the prevalence of psychiatric disorders in the general population, women with lifetime CUD were more likely than men to have any substance use disorder (OR=0.71, 95% CI=0.54–0.94), an alcohol use disorder (OR=0.67, 95% CI=0.53–0.83), nicotine dependence (OR=0.77, 95% CI=0.63–0.93), bipolar I and II (OR=0.74, 95% CI=0.58–0.95), conduct disorder (OR=0.29, 95% CI=0.15–0.58), pathological gambling (OR=0.41, 95% CI=0.17–0.96), and antisocial personality disorder (OR=0.53, 95% CI = 0.40–0.71; Table 2). After adjusting for gender differences in sociodemographic characteristics and in the prevalence of psychiatric disorders in the general population, men with lifetime CUD did not have an increased risk of any psychiatric comorbidity.

3.3. Clinical Characteristics and Course of Lifetime Cannabis Use Disorder

Table 3 shows that men with CUD tended to meet significantly more criteria for cannabis abuse (mean = 1.62 versus 1.49 criteria, F = 13.66, p <.05), smoked significantly more joints per day (mean = 3.38 versus 2.54 joints, F = 30.84, p<.05), and tended to have significantly longer episodes of CUD (mean = 40.43 months versus 31.01 months, F = 12.04, p<.05). There were no gender differences in the age at first or heavy cannabis use, age at onset of CUD, total number of episodes of cannabis abuse or dependence, or in the number of criteria met for cannabis dependence. The time from age at first use of cannabis to the age at onset of the CUD was longer among men (mean = 2.64 versus 2.24 years, F = 5.20, p<.05) thus providing evidence for the telescoping phenomenon in CUD. Most individuals with CUD (77.8% of men and 82.1% of women) were able to remit from the disorder. However, men were older at remission (mean = 25.32 versus 23.08 years, F = 48.45, p<.05), and were less likely to remit than women (OR = 0.77, 95% CI = 0.62–0.95; Table 3).

3.4. Treatment-Seeking Behaviors

Table 4 shows that the overall rates of treatment seeking were very low for both genders. Only 14.20% of men and 12.43% of women with a CUD sought treatment. There were no gender differences in treatment-seeking rates, in the types of treatment sought, or in the reasons for not seeking treatment (Table 4).

4. DISCUSSION

In a nationally representative sample of the U.S. population, there were several gender differences among individuals with CUD. We highlight five major findings: 1) men with

CUD had higher rates of other substance use disorders and ASPD, whereas women with CUD had higher comorbidity with mood and anxiety disorders. However, after adjusting for gender differences in sociodemographic characteristics and in the prevalence of psychiatric disorders in the general population, women with CUD had a higher risk for externalizing disorders than men with CUD; 2) the severity of CUD was higher in men; 3) women experienced telescoping to CUD; 4) although men were slightly less likely to remit from CUD, nearly 80% of both men and women achieved remission from CUD; and 5) rates of treatment-seeking for CUD were very low for both genders.

Men with CUD were significantly more likely to have other substance use disorders and ASPD compared to women with CUD, whereas women with CUD had higher rates of comorbid mood and anxiety disorders. While little work has focused directly on gender differences in psychiatric comorbidity among individuals with CUD, our results are consistent with data from clinical (Brooner et al., 1997; Cornelius et al., 1995; Hesselbrock et al., 1985) and epidemiological samples of individuals with substance use disorders in general (Helzer et al., 1987; Kessler et al., 1997). Several factors may contribute to the link between CUD and ASPD in men. The high rate of comorbidity between the two disorders may indicate that they represent different manifestations of a common externalizing factor (Krueger et al., 2002, 2007). Twin studies suggest that shared genetic factors influence the occurrence of ASPD and substance use disorders (Grove et al., 1990; Hicks et al., 2004; Kendler et al., 2003; Pickens et al., 1995). Their co-occurrence may also be due to shared risk factors, such as neurobehavioral disinhibition (Tarter et al., 2003). It is also possible that one disorder may cause the other (Loeber and Keenan, 1994; Robins and McEvoy, 1990). Lastly, cannabis use may lead to deviant behaviors like intoxication or criminal behavior (van den Bree et al., 1998), whereas the impulsivity of many individuals with ASPD may lead to initiation of cannabis use and eventually to cannabis use disorders (van den Bree et al., 1998).

After adjusting for gender differences in sociodemographic characteristics and in the distribution of psychiatric disorders in the general population, CUD amplified the risk of many externalizing disorders among women compared to men, a finding not previously documented. The reasons for this increased risk of externalizing disorders in women are unknown, but may be partly influenced by developmental mechanisms. Early aggression and conduct problems predict a greater opportunity for (Storr et al., 2011) and likelihood of (Pedersen et al., 2001) cannabis use among women when compared to men. Less overt aggressive behavior and conduct problems (e.g., non-compliance with parental requests, verbal bullying; Pedersen et al., 2001) may also contribute to cannabis initiation among adolescent women. Furthermore, there is evidence that antisocial behavior also predicts the transition to daily use of cannabis among women, whereas peer use and drug availability are more important factors for men (Coffey et al., 2000). The influence of conduct problems among female cannabis users may also predispose them to develop other externalizing disorders.

After adjusting for gender differences in sociodemographic characteristics and in the distribution of internalizing disorders in the general population, women with CUD had a higher risk than men with CUD for bipolar I and II, but overall the gender differences in internalizing disorders remained the same. The comorbidity of internalizing disorders among women with CUD may simply reflect the higher rates of mood and anxiety disorders that occur among women in the general population (Hasin et al., 2005a). Overall, CUD appears to moderate the relationship between externalizing disorders and gender, but not between gender and internalizing disorders.

The severity of CUD was higher among men. Men met more criteria for cannabis abuse, smoked a greater number of joints per day, had longer episodes of CUD and were older at remission. Men may have a greater severity of CUD because of their greater prevalence (Arnold, 1996; Brady and Randall, 1999; Seedat et al., 2009) and liability for externalizing disorders (Hicks et al., 2007; Kramer et al., 2008). Men may also be driven to higher cannabis use because of peer use and drug availability (Coffey et al., 2000). Women may have a less severe form of CUD because of perceived stigmatization of having a substance use disorder (Beckman and Amaro, 1986; Fillmore, 1985; Landrine, 1988; Lemle and Mishkind, 1989; Lex, 1991), and because the legal consequences of a substance use disorder may be more severe for women (e.g., losing custody of their children; Ayyagari et al., 1999; DeAngelis, 1993; Finkelstein, 1994; Grella, 1997). Gender differences in the patterns of cannabis use may partially contribute to the gender differences in psychiatric comorbidity, as there is a complex bidirectional relationship between drug use and comorbidity (Coffey et al., 2000; Degenhardt et al., 2012; van den Bree et al., 1998).

While the severity of cannabis abuse was higher in men, there were no significant gender differences in the age at first use of cannabis, the age at heavy use, and the age at onset of the disorder. Despite this, women had a shorter time interval from the age at first use of cannabis to the age at onset of the CUD, in accord with studies using clinical and community samples that examined telescoping to cannabis dependence (Ehlers et al., 2010; Hernandez-Avila et al., 2004). The causes of telescoping to CUD are not well understood, but may involve gender differences in reinforcement (Fattore et al., 2007) or the role of comorbidity in the course of CUD (Lopez-Quintero et al., 2011). Telescoping has also been documented in clinical and epidemiological samples of pathological gamblers (Blanco et al., 2006; Tavares et al., 2003). Some studies based on treatment samples have also found that women have an accelerated clinical course of alcohol dependence (Johnson et al., 2005; Piazza et al., 1989; Randall et al., 1999), but these studies were findings from our group, indicate that telescoping may not occur in general population samples of individuals with alcohol dependence (Keyes et al., 2010). There may be sample and substance-specific aspects to telescoping.

Although most individuals in our sample did not seek treatment for CUD, 77.8% of men and 82.1% of women achieved remission, and did so by their mid-20s. This high rate of remission is consistent with previous work (Coffey et al., 2000; Kandel and Davies, 1992; von Sydow et al., 2001), and may indicate that CUD is a disorder that remits naturally for a high proportion of individuals (Lopez-Quintero et al., 2011), although it may take several years to remit (Lopez-Quintero et al., 2011). This decline in cannabis use may be explained with the transition to adult roles and responsibilities (Chen and Kandel, 1995), which may decrease motivation to use illicit drugs (Kandel and Yamaguchi, 1987; Yamaguchi and Kandel, 1985). Increased contact with environments in which CUD has less acceptability (such as work settings) may also exert a powerful influence on the likelihood of experiencing remission (Lopez-Quintero et al., 2011).

Our study was the first to examine gender differences in treatment-seeking. We found no differences in rates of treatment-seeking or in the reasons not to seek treatment. Lack of motivation, stigma, and logistical issues were important barriers for both genders. These findings are consistent with previous studies documenting that a substantial proportion of individuals with substance use disorders in general do not seek treatment (Agosti and Levin, 2004; Kessler et al., 2001; Mojtabai, 2005; SAMHSA, 2007; Wu and Ringwalt, 2004). Substance use disorders may have low treatment-seeking rates because of low perceived need for treatment (Wang et al., 2005) or because there is a tendency to view substance use problems as social or criminal in nature, rather than medical (Kaskutas et al., 1997; Mojtabai et al., 2002; Wang et al., 2005). The belief that cannabis use is not harmful (Ellingstad et al.,

2006) or is less harmful than other illicit drugs (Gates et al., 2009) may also decrease motivation to seek treatment. The lack of specific treatment approaches for CUD (Strike et al., 2003) and reluctance to attend programs focused mainly on alcohol, cocaine, and opiate dependence may also represent important barriers to treatment (Stephens et al., 1993).

Our study has limitations common to most large-scale surveys. First, information was based on self-report and not confirmed by collateral informants. Second, our study is cross-sectional, limiting the inferences that can be drawn. Third, general population surveys like the NESARC may fail to capture some individuals with CUD because individuals with substance use disorders are less likely to live in households (Grant et al., 2003). The NESARC, however, also sampled from shelters and group homes; this strategy increases the representation of individuals with CUD within the sample, and makes the underrepresentation of this population less likely. Fourth, although the NESARC provides the most extensive assessment of psychiatric disorders among men and women with CUDs, some disorders such as obsessive-compulsive disorder were not assessed in this study.

Despite these limitations, the NESARC constitutes the largest nationally representative survey to date to include detailed information on gender differences in psychiatric disorders, clinical course, and treatment seeking patterns among individuals with CUD. Our study indicates that almost all men and women with CUD have a comorbid psychiatric disorder. After adjusting for gender differences in the sociodemographic characteristics and in the distribution of psychiatric disorders in the general population, CUD increased the likelihood of externalizing disorders among women compared to men. Although the severity of CUD was generally higher among men, we found evidence for the telescoping phenomenon among women with CUD. Taken together, these findings suggest that there may be gender-specific pathways that distinctly influence the development and course of CUD, which may give clues about its etiology. Despite these gender differences in CUD, treatment-seeking rates were low for both genders. In spite of our progress in understanding the neurobiology of cannabis related problems, there is an ongoing need to improve the acceptability and effectiveness of treatment approaches for CUD.

Acknowledgments

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Table 1

Sociodemographic Characteristics Among Respondents with Lifetime DSM-IV Cannabis Use Disorder (CUD) by Gender

Characteristic	Male n=2,080 %	SE	Female [a] n=1,217 %	SE	OR		CI	
Race/Ethnicity								
White[a]	77.13	1.33	78.54	1.53	1.00	1.00		1.00
Black	9.90	0.85	9.10	0.99	1.11	0.84		1.46
Native American	3.66	0.55	4.31	0.77	0.86	0.55		1.37
Asian	1.63	0.39	1.06	0.35	1.57	0.67		3.67
Hispanic	7.67	0.91	6.99	0.85	1.12	0.85		1.47
Nativity								
US-born[a]	95.72	0.72	96.94	0.47	1.00	1.00		1.00
Foreign-born	4.28	0.72	3.06	0.47	1.41	0.91		2.19
Age								
18–29 [a]	29.19	1.25	35.82	1.60	1.00	1.00		1.00
30–44	42.15	1.29	43.05	1.63	1.20	1.00		1.44
>45	28.66	1.23	21.13	1.21	1.66	**1.34**		**2.06**
Education								
< High School	14.61	0.95	10.42	1.11	1.62	**1.25**		**2.11**
High School	29.88	1.34	25.41	1.57	1.36	**1.10**		**1.68**
College [a]	55.51	1.44	64.18	1.59	1.00	1.00		1.00
Individual Income								
0–19,000 a	35.74	1.34	58.74	1.86	1.00	1.00		1.00
20–34,000	24.98	1.23	22.16	1.48	1.85	**1.48**		**2.32**
35–69,000	27.69	1.21	15.11	1.24	3.01	**2.39**		**3.79**
>70,000	11.59	1.04	3.99	0.76	4.77	**3.06**		**7.44**
Employment Status								
Employed [a]	81.15	1.02	69.34	1.52	1.00	1.00		1.00
Unemployed	18.85	1.02	30.66	1.52	0.53	**0.44**		**0.63**
Marital Status								

Characteristic	Male n=2,080 %	SE	Female [a] n=1,217 %	SE	OR	CI	
Married [a]	54.74	1.22	52.98	1.67	1.00	1.00	1.00
Widowed/Divorced	14.17	0.87	19.26	1.29	0.71	**0.58**	**0.88**
Never Married	31.08	1.14	27.76	1.48	1.08	0.89	1.31
Urbanicity							
Urban [a]	80.47	1.89	80.06	2.34	1.00	1.00	1.00
Rural	19.53	1.89	19.94	2.34	0.97	0.76	1.25
Region							
Northwest	18.07	2.99	18.01	3.12	1.03	0.77	1.37
Midwest	24.78	3.26	27.11	3.40	0.94	0.71	1.23
South	29.97	3.04	27.03	3.03	1.14	0.87	1.48
West [a]	27.18	3.71	27.85	3.74	1.00	1.00	1.00
Insurance							
Public	9.32	0.82	11.47	1.10	0.83	0.63	1.09
Private a	64.87	1.53	66.14	1.81	1.00	1.00	1.00
No insurance	25.81	1.46	22.39	1.58	1.18	0.94	1.47

[a]Reference group

Table 2

Lifetime Psychiatric Comorbidity Among Respondents with Lifetime DSM-IV Cannabis Use Disorder (CUD) by Gender

Characteristic	Male N=2,080		Female N=1,217		Gender Main Effect [a]			Interaction Effect [b]		
	%	SE	%	SE	AOR [c]	CI	CI	AOR [c]	CI	CI
Any Psychiatric Disorder	95.57	0.53	94.14	0.85	1.25	1.19	1.31	1.08	0.72	1.61
Any Axis I Disorder	94.87	0.55	93.77	0.86	1.26	1.19	1.32	0.98	0.67	1.42
Any Substance Use Disorder [d]	92.22	0.69	88.39	1.05	2.18	2.06	2.31	0.71	0.54	0.94
Alcohol Use Disorder	84.97	0.99	74.56	1.62	2.90	2.72	3.09	0.67	0.53	0.83
Alcohol Abuse	32.77	1.25	31.89	1.62	2.66	2.47	2.86	0.39	0.32	0.48
Alcohol Dependence	52.20	1.24	42.67	1.83	2.28	2.07	2.51	0.64	0.52	0.79
Any Drug Use Disorder	41.60	1.41	37.34	1.59	1.27	1.07	1.51	0.94	0.73	1.21
Drug Abuse	35.58	1.37	29.93	1.50	1.44	1.18	1.75	0.90	0.68	1.18
Drug Dependence	13.06	0.93	14.21	1.21	1.02	0.77	1.37	0.89	0.60	1.30
Nicotine Dependence	50.93	1.40	52.73	1.85	1.22	1.13	1.30	0.77	0.63	0.93
Any Mood Disorder	30.58	1.35	49.47	1.63	0.49	0.45	0.52	0.93	0.76	1.13
Major Depressive Disorder	17.35	1.12	28.12	1.50	0.44	0.40	0.47	1.23	0.96	1.58
Bipolar I and II	12.36	0.88	19.49	1.31	0.79	0.68	0.91	0.74	0.58	0.95
Dysthymia	4.88	0.62	9.41	0.96	0.44	0.37	0.51	1.13	0.77	1.67
Any Anxiety Disorder	25.67	1.31	40.16	1.68	0.48	0.44	0.51	1.08	0.88	1.33
Panic Disorder	8.22	0.80	18.48	1.35	0.42	0.37	0.49	0.93	0.71	1.23
Social Anxiety Disorder	9.23	0.85	13.00	1.24	0.66	0.58	0.75	1.03	0.75	1.42
Specific Phobia	13.18	1.02	23.19	1.44	0.42	0.38	0.45	1.21	0.96	1.53
Generalized Anxiety Disorder	6.94	0.76	13.33	1.16	0.45	0.39	0.53	1.07	0.76	1.51
Conduct Disorder	1.92	0.37	2.49	0.58	2.62	2.05	3.36	0.29	0.15	0.58
Pathological Gambling	1.58	0.30	1.26	0.41	3.07	2.10	4.49	0.41	0.17	0.96
Psychotic Disorder	2.58	0.51	2.96	0.60	0.87	0.62	1.21	1.00	0.50	2.01
Any Personality Disorder	36.16	1.39	35.37	1.74	0.99	0.92	1.07	1.04	0.85	1.28
Avoidant	5.23	0.76	7.44	0.94	0.58	0.48	0.71	1.18	0.74	1.88
Dependent	1.46	0.46	1.74	0.40	0.41	0.25	0.66	2.05	0.83	5.10
Obsessive-Compulsive	15.09	1.03	15.81	1.19	0.92	0.85	1.01	1.03	0.79	1.33
Paranoid	9.80	0.80	13.30	1.07	0.67	0.58	0.77	1.06	0.80	1.42

Characteristic	Male N=2,080		Female N=1,217		Gender Main Effect [a]			Interaction Effect [b]		
	%	SE	%	SE	AOR [c]	CI		AOR [c]	CI	
Schizoid	7.16	0.76	7.85	0.92	0.95	0.81	1.10	0.96	0.65	1.42
Histrionic	5.53	0.64	6.64	0.81	0.92	0.74	1.14	0.90	0.59	1.37
Antisocial	21.10	1.08	14.36	1.28	2.99	**2.49**	**3.59**	0.53	**0.40**	**0.71**

[a] Females are the reference group for the gender main effect,

[b] Femaeles without CUD are the reference group for the gender by CUD interaction effect,

[c] The adjusted odds ratio is from the logistic regression model that controls for gender, CUD the interaction of gender and CUD, and socioeconomic factors (ethnicity, nativity, age, education, individual income, employment status, marital status, urbanicity, and region).

[d] Except cannabis dependence or abuse.

Table 3

Clinical Characteristics and Course Among Respondents with Lifetime DSM-IV Cannabis Use Disorder (CUD) by Gender

Characteristic	Male n=2,080		Female [a] n = 1,217				
	Mean	SE	Mean	SE	Wald F	P-value	
Age at first use, years	16.71	0.10	16.73	0.12	0.02	0.8768	
Age at heavy use, years	18.15	0.16	18.28	0.25	0.19	0.6676	
Age at onset, years	19.34	0.13	18.98	0.16	2.73	0.1035	
Age at remission, years	25.32	0.22	23.08	0.23	48.45	**<0.0001**	
Number of Episodes							
Abuse	2.36	0.17	2.17	0.48	0.14	0.7069	
dependence	2.55	0.54	1.76	0.15	1.97	0.1648	
Total no. of criteria							
Abuse [b]	1.62	0.02	1.49	0.03	13.66	**0.0005**	
Dependence [b]	4.23	0.08	4.20	0.09	0.07	0.7982	
Duration of longest episode, months	40.43	2.09	31.01	2.10	12.04	**0.0009**	
Average number of joints smoked/day during period of most frequent use	3.38	0.12	2.54	0.12	30.84	**<0.0001**	
Time from age at first use to age at onset of the disorder, years	2.64	0.10	2.24	0.13	5.20	**0.0259**	

Characteristic	%	SE	%	SE	OR	CI	
Remission	77.83	1.13	82.10	1.28	0.77	**0.62 0.95**	

[a]Reference group

[b]Among individuals with cannabis abuse or dependence

Treatment-seeking Behaviors Among Respondents with Lifetime DSM-IV Cannabis Use Disorders (CUD) by Gender

Characteristic	Male n=2,080		Female [a] n=1,217			
	%	SE	%	SE	OR	CI
Treatment type						
Any treatment	14.20	0.98	12.43	1.03	1.17	0.92 1.48
Professional Treatment	12.45	0.95	11.16	1.00	1.13	0.87 1.46
Outpatient treatment	9.53	0.79	9.66	0.97	0.98	0.74 1.30
Inpatient treatment [b]	9.27	0.88	7.03	0.81	1.35	0.98 1.86
Emergency room	3.11	0.46	2.95	0.49	1.06	0.66 1.70
Human Service Professional Treatment [c]	11.44	0.91	9.57	0.91	1.22	0.93 1.61
Reasons for Not Getting Help [d]						
Logistical [e]	39.55	4.17	38.92	4.85	1.03	0.59 1.78
Lack of Motivation [f]	75.92	3.88	75.88	4.20	1.00	0.53 1.90
Stigma [g]	40.05	4.28	44.01	4.85	0.85	0.51 1.42
Decreased perceived need [h]	20.26	2.98	22.88	4.27	0.86	0.46 1.60

[a]Reference group.

[b]Includes detoxification or rehabilitation unit.

[c]Went to a member of the clergy, attended self-help groups, received treatment through an employee assistance program, through family or social services, halfway houses, crisis centers, or other therapeutic community.

[d]Among those who did not seek treatment.

[e]Financial difficulties, lack of transport and time, couldn't speak English, didn't know where to get help, failed previous attempts in getting help.

[f]Didn't want help or believe anyone could help, thought the problem wasn't serious enough, wanted to handle the problem alone.

[g]Was embarrassed by the problem, afraid of treatment, family member objected.

[h]Stopped by themselves, or friends or family helped them stop.