Published in final edited form as:

Drug Alcohol Depend. 2015 November 1; 156: 47–56. doi:10.1016/j.drugalcdep.2015.08.026.

Gender and Nonmedical Prescription Opioid Use and DSM-5 Nonmedical Prescription Opioid Use Disorder: Results from the National Epidemiologic Survey on Alcohol and Related Conditions – III

Bradley T. Kerridge¹, Tulshi D. Saha², S. Patricia Chou², Haitao Zhang², Jeesun Jung², W. June Ruan², Sharon M. Smith², Boji Huang², and Deborah S. Hasin³

Bradley T. Kerridge: BradleyKerridge@gmail.com

¹Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY 10032, Phone: 831-246-0751

²Laboratory of Epidemiology and Biometry, Division of Intramural Clinical and Biological Research, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, Bethesda, MD 20892

³Department of Psychiatry, College of Physicians and Surgeons, and Mailman School of Public Health, Columbia University, and New York State Psychiatric Institute, New York, NY 10032

Abstract

Background—Little is known about sex-specific risk for nonmedical prescription opioid use (NMPOU) and DSM-5 nonmedical prescription opioid use disorder (NMPOUD). The objective of the present study was to present prevalence, correlates, psychiatric comorbidity, treatment and disability of NMPOU and DSM-5 NMPOUD among men and women.

Methods—Nationally representative sample of the U.S.

Results—Prevalences of 12-month and lifetime NMPOU were greater among men (4.4%, 13.0%) than women (3.9%, 9.8%), while corresponding rates of DSM-5 NMPOUD did not differ between men (0.9%, 2.2%) and women (0.9%, 1.9%). Regardless of time frame and sex, NMPOU and NMPOUD generally decreased with age and were lower among Blacks, Asians/Pacific Islanders and Hispanics, and respondents with lower socioeconomic status. Among men with NMPOU, rates were lower among respondents in the Northeast and South and among those

Correspondence to: Bradley T. Kerridge, BradleyKerridge@gmail.com.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Contributors

Dr. Kerridge wrote the first draft of the manuscript and all other authors contributed to subsequent draft revisions. Drs. Kerridge, Saha, Zhang, Jung, Ruan and Smith contributed to the data analyses. All authors participated in the concept, design and collection of study data.

Conflict of Interest

No authors claim conflict of interest.

previously married (lifetime). Across time frames and gender, NMPOU and NMPOUD were generally associated with other substance use disorders, posttraumatic stress and borderline, schizotypal and antisocial personality disorders, but associated with major depressive disorder, persistent depression and bipolar I disorder only among men. Disability increased with NMPOU frequency and NMPOUD severity. Only 7.6% and 8.2% of men and women with NMPOU ever received treatment, while 26.8% and 31.1% ever received treatment for NMPOUD.

Conclusions—NMPOU and NMPOUD are highly disabling, associated with a broad array of sex-specific and shared correlates and comorbidities and largely go untreated in the U.S. Valid assessment tools are needed that include gender as a stratification variable to identify NMPOU and NMPOUD.

Keywords

Opioid Use Disorder; Gender Differences; Comorbidity; Disability; Treatment

1. INTRODUCTION

The past decade has witnessed a startling rise in harms from nonmedical prescription opioid use (NMPOU): drug poisoning death rates attributable to NMPOU have tripled; (Warner et al., 2011), opioid-related emergency room visits increased by 153%; (Substance Abuse and Mental Health Services Administration (SAMHSA), 2013) and drug treatment admission rates for nonheroin opioids increased 236% (SAMHSA, 2014). NMPOU is also associated with many other adverse health consequences including nonmedical prescription opioid use disorder (NMPOUD; Huang et al, 2006), psychiatric comorbidity (Armari et al., 2011; Becker et al., 2008; Compton et al., 2005; Katz et al., 2013; Martins et al., 2009, 2012), cognitive impairment and drug interactions (U.S Department of Health and Human Services, 2011), transitions to injection drug or heroin use with resultant infections (Jones et al., 2013; Pollini et al., 2011; Muhuri et al., 2013), falls and fractures among older adults (Miller et al, 2011; Rolita et al., 2013) and neonatal opioid withdrawal syndrome (Creanga et al., 2012). Societal costs of NMPOU and NMPOUD are estimated at \$53 to \$72 billion annually (Birnbaum et al., 2011; Coalition Against Insurance Fraud, 2007; Hansen et al., 2011).

Despite important sex differences in sociodemographic and clinical correlates of NMPOU and NMPOUD observed among chronic pain patients (Campbell et al., 2010; Fillingim et al., 2003; Jamison et al., 2010; Manubay et al., 2015) and individuals in substance abuse treatment (Back et al., 2011; Green et al., 2009; McHugh et al., 2013), little is known about sex-specific correlates of NMPOU and NMPOUD in the U.S. general population. This is especially true for NMPOUD since few national surveys have collected the information necessary to derive diagnoses of NMPOUD and the full range of its psychiatric comorbidities. In the 2001–2002 National Institute on Alcohol Abuse and Alcoholism's (NIAAA) National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), 12-month and lifetime rates of NMPOU were greater among men (2.1%; 6.1%) than women (1.5%; 3.5%; Huang et al., 2006). Similarly, 12-month and lifetime prevalences of Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV; American Psychiatric Association, 1994) NMPOUD were greater among men (0.5%; 2.0%)

than women (0.2%; 0.9%). Substantial comorbidity was observed among NMPOUD and other DSM-IV substance, mood anxiety and personality disorders (Huang et al., 2006).

In the 2013 Substance Abuse and Mental Health Services Administration's National Survey on Drug Use and Health (NSDUH), prevalences of DSM-IV 12-month and lifetime NMPOU were greater among men (4.6% and 15.7%) than women (3.8% and 12.7%; SAMHSA, 2014). The rate of 12-month DSM-IV NMPOUD in 2013 was also greater among men (0.9%) than women (0.6%). Studies using earlier data from the NSDUH found greater rates of NMPOU among men (Back et al., 2010; Tetrault et al., 2007) but no sex differences in rates of 12-month NMPOUD (Back et al., 2010). However, NSDUH does not assess lifetime diagnoses, disability or the full range of psychiatric disorders.

To date, only one national survey has examined sex-specific risk profiles of NMPOU and NMPOUD directly, using data from 2003, which are now over a decade old (Tetrault et al., 2007). Moreover, all previous national estimates of NMPOUD were based on DSM-IV criteria. However, DSM-5 (American Psychiatric Association, 2013) made major changes to the NMPOUD diagnosis, including combining most abuse and dependence criteria into a single diagnosis, adding a craving criterion, and setting a diagnostic threshold of 2 criteria (Hasin et al., 2013). Major changes were also made to mood and anxiety disorders, suggesting the need to examine NMPOUD and its psychiatric correlates using DSM-5 criteria.

Because of the seriousness of NMPOU and NMPOUD, the lack of gender-specific information about NMPOU and DSM-5 NMPOUD in the United States from a single, reliable and uniform source represents a critical knowledge gap. We therefore present sex-specific national data on the prevalence, correlates, comorbidity, disability and treatment of NMPOU and DSM-5 NMPOUD from the 2012–2013 NIAAA NESARC-III (Grant et al., 2014).

2. METHODS

2.1 Sample

The target population of NESARC-III was the U.S. noninstitutionalized adult civilian population residing in households and selected group quarters. As detailed elsewhere (Grant et al., 2014), probability sampling was used to select respondents. Primary sampling units were counties or groups of contiguous counties, secondary sampling units (SSUs) comprised groups of Census-defined blocks, and tertiary sampling units were households within SSUs. Eligible adults within sampled households were randomly selected. Hispanics, Blacks, and Asians were oversampled; in households with 4 eligible minority persons, two respondents were selected (n=1661). The total sample size was 36,309. The screener- and person-level response rates were 72.0% and 84.0%, yielding a total response rate of 60.1%, comparable to most current U.S. national surveys (Centers for Disease Control and Prevention, 2013; SAMHSA, 2014). Data were adjusted for oversampling and nonresponse, then weighted to represent the US civilian population based on the 2012 American Community Survey (Bureau of the Census, 2012). Weighting adjustments compensated adequately for nonresponse as detailed elsewhere (Grant et al., 2015a). Respondents gave informed consent

and received \$90.00 for survey participation. Protocols were approved by National Institutes of Health and Westat Institutional Review Boards.

2.2 Assessments

The NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule-5 (AUDADIS-5) (Grant et al., 2011), was designed to measure DSM-5 alcohol (AUD), nicotine (NUD), other specific drug use disorders (DUDs), and selected mood, anxiety, trauma-related, eating and personality disorders (PDs). The timeframes for most AUDADIS-5 diagnoses were the past 12-months and prior-to-past 12-months. Twelve-month and prior-to-past 12-month information was aggregated into lifetime measures.

2.3 NMPOU and NMPOUD

NMPOU was defined as use “without a prescription” or “in greater amounts, more often, or longer than prescribed, or for a reason other than a doctor said you should use them”.

Lifetime DSM-5 NMPOUD diagnoses required 2 of 11 criteria in the 12 months before the interview or prior-to-the-past 12-months. Prior-to-the-past 12-months diagnoses required clustering of 2 criteria within a single year. Test-retest reliability of 12-month and prior-to-the-past 12-months NMPOU and frequency of NMPOU were substantial ($\kappa=0.66$, 0.66) in a large general population sample ($N=1006$; Grant et al., 1995). Reliability of 12-month and prior-to-the-past 12-months DSM-5 NMPOUD categorical diagnoses ($\kappa=0.40$, 0.47) and dimensional criteria scales (intraclass correlation coefficient [ICC]= 0.71 , 0.73) was moderate to substantial (Grant et al., 2015b). In a separate general population sample ($n=712$), procedural validity of DSM-5 NMPOUD was assessed through blind clinical reappraisal using the clinician-administered, semi-structured Psychiatric Research Interview for Substance and Mental Disorders, DSM-5 version (PRISM-5) (Hasin et al., 2011). Findings indicated moderate concordance between AUDADIS-5 and PRISM-5 NMPOUD diagnoses ($\kappa=0.40$, 0.49), and substantial concordance between their dimensional counterparts (ICC= 0.68 , 0.79 ; Hasin et al., 2015a).

2.4 Other Psychiatric Disorders

DSM-5 AUD, NUD and other DUD diagnoses (sedative/tranquilizer, cannabis, stimulant, cocaine, club drug, opioid, heroin, hallucinogen, and solvent/inhalant) were derived similarly to NMPOUD. Sedative/tranquilizer and stimulant use disorders were aggregated to yield other nonmedical prescription DUD diagnoses, with the remaining DUDs aggregated to yield diagnoses of any other DUD. In the same general population samples noted above, test-retest reliabilities were moderate to substantial for AUD ($\kappa=0.60$, 0.62), NUD ($\kappa=0.50$, 0.87) and all other DUDs ($\kappa=0.41$ – 0.54), and higher for their dimensional counterparts (ICCs= 0.45 – 0.85 ; Grant et al., 2015b). AUDADIS-5 and PRISM-5 concordance on AUD, NUD and other DUD diagnoses and dimensional scales was moderate to substantial ($\kappa=0.35$ – 0.72 ; ICCs= 0.38 – 0.92 ; Hasin et al., 2015a).

DSM-5 mood disorders assessed in the NESARC-III included 12-month and lifetime persistent depression, major depressive, bipolar I and bipolar II disorders. Anxiety disorders included panic, agoraphobia, generalized anxiety, and social and specific phobias.

Posttraumatic stress disorder (PTSD) was also assessed. All diagnoses excluded substance- and medical illness-induced cases. Lifetime PDs included antisocial, borderline, and schizotypal. Test-retest reliability of DSM-5 psychiatric disorder diagnoses was fair to good ($\kappa=0.35\text{--}0.54$; Grant et al., 2015b). Reliability of associated DSM-5 dimensional scales was greater ($\kappa=0.50\text{--}0.79$). Concordance between AUDADIS-5 and PRISM-5 diagnoses for these disorders was fair to good ($\kappa=0.20\text{--}0.59$), with good concordance (ICC generally ≥ 0.53) for many corresponding dimensional scales (Hasin et al., 2015b).

2.5 Treatment/Disability

Treatment utilization for problems with opioids among individuals with NPOU and NMPOUD was assessed for 14 modalities, including 12-step programs and major inpatient and outpatient settings. Current disability was determined using the Short Form 12, version 2 (SF-12v2), a reliable and valid measure widely used in population surveys (Gandek et al., 1998). SF-12v2 scales included mental health, social functioning, role emotional functioning, bodily pain, and mental component summary (MCS). Each SF-12v2 disability score has a mean of 50, standard deviation of ± 10 , and a range of 0–100. Lower scores indicate greater disability. Current disability was assessed for frequency of NMPOU (once a month or less, 2–8 times/month, 3–4 times/week, every day or nearly every day) and severity of DSM-5 NMPOUD (mild, 2–3 criteria; moderate, 4–5 criteria; severe, 6+ criteria).

2.6 Statistical Analysis

Weighted means, frequencies and cross-tabulations were computed for 12-month and lifetime NMPOU and DSM-5 NMPOUD and sex difference were examined for the total sample. All other analyses were conducted separately among men and women. Adjusted odds ratios (ORs) derived from multiple logistic regression analyses indicated associations between NMPOU and NMPOUD and each sociodemographic characteristic controlling for all others. Logistic regressions of psychiatric comorbidity with NMPOU and NMPOUD controlled for sociodemographic characteristics and other substance use and psychiatric disorders. Eating disorders were too rare to assess comorbid associations with NMPOU and NMPOUD but were used as covariates in comorbidity analyses. Treatment utilization for problems with opioids among individuals with NMPOU and NMPOUD was assessed across treatment modality. Relationships between SF-12v2 scales and 12-month NMPOU by frequency of use and 12-month DSM-5 NMPOUD by severity level were determined using multiple linear regression, controlling for sociodemographic characteristics and other psychiatric disorders. All analyses utilized SUDAAN (Research Triangle Institute, 2012) software to account for the complex sample design of the NESARC-III.

3. RESULTS

3.1 NMPOU

The prevalences of 12-month NMPOU was greater among men than women (4.4% and 3.9%; adjusted odds ratio (AOR) = 1.2, 95% confidence limit (CI) = 1.04–1.32) (Table 1). Among both sexes, rates of 12-month NMPOU were lower among Asian/Pacific Islanders and in the two youngest age groups and among those with incomes < \$20,000.00. Among

men, the prevalence of NMPOU was also lower among respondents with annual incomes between \$35,000.00 and \$69,999.00 and residents of the Northeast. Among women, prevalences of 12-month NMPOU were lower among Hispanics and residents of the South.

Men had greater rates of lifetime NMPOU (13.0% and 9.8%: AOR = 1.4, 95% CI = 1.30 – 1.55). Lifetime prevalences of NMPOU among both sexes were lower among Blacks, Hispanics and Asian/Pacific Islanders and residents of the South. Rates were also greater among the two youngest age groups, the previously married, and those with annual incomes < \$35,000.00. Further, among men, rates were greater among respondents with incomes between \$35,000.00 and \$69,999.00 and among the never married and lower among residents of the Northeast.

3.2 NMPOUD

The prevalence of 12-month DSM-5 NMPOUD among men (0.9%) and women (0.9%) did not differ (AOR = 1.1; 95% CI = 0.85–1.48) (Table 2). Among men, 12-month NMPOUD was greater among 18-to-29 year-olds, those with high school education, < \$35,000.00 annual income and residents of urban areas. Rates among men were also lower among Blacks, Hispanics and Asian/Pacific Islanders. Among women, 12-month prevalences were greater among respondents with annual incomes < \$20,000.00.

There was no difference between men (2.2%) and women (1.9%) in the prevalence of lifetime NMPOUD (AOR = 1.2; 95% CI = 0.98–1.40). Among both sexes, lifetime rates of NMPOUD were lower among Blacks, Hispanics and Asian/Pacific Islanders and greater among the two youngest age groups and respondents with annual incomes < \$35,000.00. For men, prevalences were also greater among previously married respondents and those with high school education. Among women, the lifetime prevalence of NMPOUD was greater among respondents with annual incomes between \$35,000.00 and \$69,000.00.

3.3 Comorbidity

With few exceptions, 12-month and lifetime NMPOU were strongly related to other nonmedical prescription DUDs, other DUDs, AUD, NUD and posttraumatic stress disorder among both sexes (Table 3). Among men, 12-month and lifetime NMPOU was associated with major depressive disorder and persistent depression. Further, lifetime NMPOU was associated with agoraphobia among women. Twelve-month and lifetime NMPOU was associated with schizotypal, borderline and antisocial PDs among men, associations only observed with lifetime NMPOU among women.

Similar to NMPOU, 12-month and lifetime NMPOUD was strongly related to all other SUDs and PTSD regardless of sex. Among men, 12-month and lifetime NMPOUD were associated with persistent depression and bipolar 1 disorder (lifetime only). Borderline and antisocial PDs were associated with 12-month NMPOUD among men and lifetime NMPOUD among women. Lifetime NMPOUD was also associated with schizotypal and antisocial PDs among men.

3.4 Opioid-Specific Treatment

Men and women were equally likely to be treated for NMPOU in the past twelve months (6.2% and 4.7%) and on a lifetime basis (7.6% and 8.2%) (Table 4). Among men with 12-month NMPOU, 3.1% received treatment from physicians/healthcare practitioners, 2.0% participated in 12-step programs and between 1.0% and 1.8% were treated in rehabilitation programs, detoxification units, and emergency departments. Other treatment modalities were utilized less frequently. Similar distributions were observed for women with 12-month NMPOU and for men and women with lifetime NMPOU, except that 12-step programs were utilized more often on a lifetime basis than physicians/health care practitioners.

Men and women were equally likely to receive opioid-specific treatment for 12-month (18.1% and 17.3%) and lifetime (26.8% and 31.1%) NMPOUD. Among men with 12-month NMPOUD, 7.9% to 8.0% received treatment from physicians/health care practitioners and participated in 12-step programs, and between 3.7% to 4.7% received treatment from rehabilitation programs, detoxification units, and other inpatient facilities, with other modalities utilized less frequently. Similar distributions of treatment seeking across settings were observed for women with 12-month NMPOUD and men and women with lifetime NMPOUD, except 12-step programs were utilized more often than physicians/health care practitioners on a lifetime basis.

3.5 Disability

All disability scores were greater among men and women with 12-month NMPOU and NMPOUD than those without these conditions (Table 5). In general, disability level, including physical pain, increased with frequency of NMPOU and severity of 12-month NMPOUD among both sexes.

4. DISCUSSION

In 2012–2013, prevalences of 12-month NMPOU were greater among men (4.4%) than women (3.9%), representing about 5.0 and 4.7 million adult Americans. Lifetime rates of NMPOU were also considerably greater among men (13.0%) than women (9.8%) or 26.7 and 14.7 million Americans. In contrast, 12-month (0.9%, 0.9%) and lifetime (2.2%, 1.9%) prevalences of NMPOUD did not differ by sex.

The sex difference observed in NMPOU is consistent with prior surveys, (Back et al., 2010; Huang et al., 2006; SAMHSA, 2014; Tetrault et al., 2007). The absence of sex differences found in NMPOU, however, is at variance with higher prevalences of NMPOUD among men observed in earlier studies (Huang et al., 2006), including NSDUH, (SAMHSA, 2014) and across many other SUDs (Compton et al., 2007; Grant et al., 2004; Hasin et al., 2007; Stinson et al., 2004, 2006). Taken together, these results are also consistent with younger age at onset of NMPOU observed among men ($\bar{x} = 26.5$ (SE = 0.38) years) than women ($\bar{x} = 29.0$ (SE = 0.57) years) while the mean age of onset of NMPOUD did not differ between men ($\bar{x} = 28.8$ (SE = 0.78) years) and women ($\bar{x} = 31.3$ (SE = 0.93) years). Also there were no differences in 12-month or lifetime NMPOUD liability among men (22.5%, 21.5%) and women (23.1%, 19.4%) with NMPOU. That is, earlier onset of NMPOU among

men is reflected in greater prevalences of the condition among men, while the absence of a sex differential in NMPOUD may reflect similar age trajectories from NMPOU to NMPOUD among men and women.

The prevalence of NMPOU and NMPOUD generally decreased with age among both sexes. Whether the declining rates observed here and previously, (Huang et al., 2006; SAMHSA, 2014; Thomas et al., 2004; West et al., 2015; Wu and Blazer, 2011) differentially reflect age, cohort or period effects (Martins et al., 2010) merits future investigation. However, while rates of NMPOU and NMPOUD were lower among individuals 45 years old, older men and women are more likely to experience pain from medical conditions for which opioids might be prescribed, and then used nonmedically, placing older adults at increasing risk of NMPOU and NMPOUD as time passes. Further, older adults are vulnerable to the adverse medical effects of opioids including nausea, somnolence, dizziness, fatigue, vomiting, falls, constipation, respiratory depression unintentional overdose and medication interactions (Papaleontiou et al., 2010). Even if rates among older adults remain stable over time, the projected increase in the size of this segment of the U.S. population (Simoni-Wastila and Yang, 2006) could produce a substantial increase in the absolute number of individuals with NMPOU and NMPOUD with concomitant increases in the adverse medical consequences of the drugs (Papaleontiou et al., 2010; Simoni-Wastila and Yang, 2006). Further studies are important to track this possibility. Recent data has also shown increasing rates of NMPOU and NMPOUD with suicidal intent and fatal outcomes between 2006 and 2013 among the elderly (West et al., 2015), findings of particular concern as the U.S. undergoes rapid expansion of its elderly population.

Consistent with prior research (Huang et al., 2006; Martins et al., 2014; SAMHSA, 2014; Wang et al., 2013; Wu et al., 2013) rates of NMPOU among both sexes and NMPOUD among men were generally greater among Whites, unmarried individuals and those at lower socioeconomic levels. For NMPOU lower rates were also observed among male residing in the South and Northeast. Native Americans had the greatest rates of NMPOU and NMPOUD, but low precision at times precluded reliable significance testing. Understanding risk factors among Whites (and Native Americans) and protective factors among minorities will be important to elucidate causes of NMPOU and NMPOUD. These findings highlight the need for more targeted prevention efforts and research on optimal treatment for sociodemographic subgroups at elevated risk, as well as potential barriers to treatment.

An important exception to the observed age gradient of NMPOU and NMPOUD is the new finding that rates of 12-month NMPOUD among women did not differ across age groups. This result may reflect the fact that women use and are prescribed opioids more often than men and more often report prescription opioids as the primary drug of abuse (McHugh et al., 2015; Parsells-Kelly et al., 2008; Simoni-Westila et al., 2000). The absence of an age differential in NMPOUD among women may also reflect greater prevalences of pain for conditions from which women suffer disproportionately, including fibromyalgia, restless leg syndrome, irritable bowel syndrome and pre-menstrual syndrome (Green et al., 2009). The absence of race-ethnic, marital status and education differences among women with NMPOUD but not men, is also consistent with sex differences observed in prescribing opioids and prevalence and perceptions of pain conditions among men and women

(Campbell et al., 2010). Physicians may also respond differently to complaints of pain among men and women and hold preconceived beliefs concerning the appropriateness of prescribing opioids for different sociodemographic subgroups (Safdar et al., 2009; Weisse et al., 2001). These factors have received too little attention in the pain literature. The results of this study highlight the need for further research in this area.

Consistent with earlier findings (Becker et al., 2005; Boyd et al., 2009; Braden et al., 2009; Compton et al., 2005; Edlund et al., 2010; Fisher et al., 2010; Frankenburg et al., 2014; Huang et al., 2006; Tragesser et al., 2013), this study revealed strong associations between NMPOU and NMPOUD and other nonmedical prescription DUDs (sedative/tranquilizer, stimulant) and smaller, but significant, associations with NUD, AUD, other DUDs, posttraumatic stress disorder and antisocial, borderline and schizotypal PDs. Stratification by gender, rare in previous studies, revealed new findings: 12-month and lifetime NMPOU was associated with major depressive disorder and persistent depression, and NMPOUD was associated with persistent depression (12-month and lifetime) and bipolar I disorder (lifetime), only among men. These findings contrast markedly with most general population surveys (Becker et al., 2008; Compton et al., 2005; Huang et al., 2006; Katz et al., 2013; Martins et al., 2009; 2012) and studies of pain patients (Campbell et al., 2010; Fillingim et al., 2003; Jamison et al., 2010; Manubay et al., 2015) and individuals in treatment for opioid use disorder (Back et al., 2011; Green et al., 2009; McHugh et al., 2013) in which affective psychopathology was much greater among women. Taken together, these findings underscore the need to diagnose and treat sex-specific comorbidities of NMPOU and NMPOUD. This is especially critical because individuals presenting with SUDs and psychiatric disorders are more likely to receive prescription opioids and long-term opioid therapy, be prescribed concurrent sedative-hypnotics, and have more physical pain (Eriksen et al., 2006; Kobus et al., 2012; Novak et al., 2009; Sullivan et al., 2013; Weisner et al., 2009) than those without these disorders. Accurate diagnosis and care of NMPOU and NMPOUD complicated by psychiatric comorbidity and pain will remain a substantial challenge in the future.

NMPOU and NMPOUD largely go untreated among both sexes. Only 6.2% of men and 4.7% of women with 12-month NMPOU received opioid-specific treatment and only 18.1% of men and 17.3% of women with 12-month NMPOUD received treatment for an opioid use disorder. This treatment gap may reflect fear of stigmatization, loss of prescriptions for opioids and subsequent increases in pain, low perceived need of treatment, lack of knowledge about symptoms of NMPOU and NMPOUD and risks involved in opioid use, beliefs that prescribed opioids are safe, and lack of available or accessible treatment (Blanco et al., 2013). Future research is urgently need to explain the excessively low rates of treatment of NMPOU and NMPOUD.

Individuals with 12-month NMPOU and NMPOUD had greater disability and pain than those without these conditions. Social and emotional impairment and interference with daily activities from pain increased with frequency of 12-month NMPOU and severity of 12-month NMPOUD, suggesting undertreatment of pain or underlying mental conditions, and perhaps attempts to self-medicate affective distress and pain, especially among men (Hasin et al., 2002; Jamison, 2002; 2013). Although patients are more likely to be prescribed

opioids if they report distress and disability, the benefits of opioid therapy to date in ameliorating these problems remains unclear (Eriksen et al., 2006; Jensen et al., 2006; Koyalagunta et al., 2012; Martell et al., 2007; Sehgal et al., 2013). These results highlight the need to target impaired functioning in NMPOU and NMPOUD, in addition to addressing pain, regardless of gender.

Limitations of the study include that not all psychiatric disorders were assessed, similar to other large U.S. surveys. Since some population segments (homeless individuals, prisoners) were not covered, prevalences of NMPOU and NMPOUD may have been underestimated. Also, the NESARC-III was cross-sectional. Longitudinal surveys are needed to investigate the stability of the observed relationships over time. This study's important strengths include the large, recently-assessed sample, reliable and valid measure of NMPOU, NMPOUD, and other psychopathology, and rigorous field methodology and quality assurance. The NESARC-III is also unique in providing current, comprehensive information on the epidemiology of NMPOU and DSM-5 NMPOUD in the U.S. from a single uniform data source.

NMPOU and NMPOUD are associated with a broad array of sex-specific and shared risk factors, comorbidities and disabilities and largely go untreated in the U.S. Valid assessment tools and algorithms are needed that include gender as a stratification variable to identify NMPOU and NMPOUD. These tools need to be particularly sensitive in diagnosing affective disorder symptomatology among men who express affective states differently from women (Bhattacharya et al., 2011; Kawa et al., 2005; Schuch et al., 2014). The treatment gap among men and women in this study underscores the need for more aggressive screening and prevention efforts. The current findings also highlight the need for multi-modal systems of care that address functional impairment and more research is needed to develop best practices (Compton and Volkow, 2006). As more information emerges on determinants, characteristics and outcomes of NMPOU and NMPOUD, potential avenues for enhancing gender-sensitive prevention and treatment will become available.

Acknowledgements

This research was supported by the National Institute on Drug Abuse, National Institutes of Health (5F32DA0364431: Dr. Kerridge), the National Institute on Alcohol Abuse and Alcoholism (K05AA014223: Dr. Hasin), the New York State Psychiatric Institute (Dr. Hasin), and the in intramural program, NIAAA, NIH.

Role of Funding Source

The NESARC-III was funded and sponsored by the National Institute on Alcohol Abuse and Alcoholism, with supplemented support from the National Institute on Drug Abuse. The sponsors had no involvement in the study design, collection, analysis and interpretation of the data, in the writing of the report and in the decision to submit the article for publication.

REFERENCES

- Amari E, Rehn J, Goldner E, Fischer B. Nonmedical prescription opioid use and mental health and pain comorbidities: a narrative review. *Can. J. Psychiatry*. 2011; 56:495–502. [PubMed: 21878161]
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fourth Edition. Washington, DC: American Psychiatric Association; 1994.

- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Fifth Edition. Arlington, VA: American Psychiatric Association; 2013.
- Back SE, Payne RL, Simpson AN, Brady KT. Gender and prescription opioids: findings from the National Survey on Drug Use and Health. *Addict. Behav.* 2010; 235:1001–1007. [PubMed: 20598809]
- Back SE, Payne RL, Wahlquist AH, Carter RE, Stroud Z, Haynes L, Hillhouse M, Brady KT, Ling W. Comparative profiles of men and women with opioid dependence: results from a national multisite effectiveness trial. *American J. Drug Alcohol Abuse.* 2011; 37:313–323.
- Becker WC, Sullivan LE, Tatrault JM, Desai RA, Fiellin DA. Non-medical use, abuse and dependence on prescription opioids among U.S. adults: psychiatric, medical substance use correlates. *Drug Alcohol Depend.* 2008; 94:38–47. [PubMed: 18063321]
- Bhattacharya A, Khesi CRJ, Munda SK, Bakhla AK, Praharaj SK, Kumar M. Sex difference in symptomatology of manic episode. *Compr. Psychiatry.* 2011; 52:288–292. [PubMed: 21497223]
- Birnbaum HG, White AG, Schiller M, Waldman T, Cleveland JM, Roland CL. Societal costs of prescription opioid abuse, dependence and misuse in the United States. *Pain Med.* 2011; 12:657–667. [PubMed: 21392250]
- Blanco C, Iza M, Schwartz RP, Rafful C, Wang S, Olfson M. Probability and predictors of treatment seeking for prescription opioid use disorders: a national study. *Drug Alcohol Depend.* 2013; 131:143–148. [PubMed: 23306097]
- Boyd CJ, Teter CJ, West BT, Morales M, McCabe SE. Non-medical use of prescription analgesics: a three-year national longitudinal study. *J. Addict. Dis.* 2009; 28:232–242. [PubMed: 20155592]
- Braden JB, Sullivan MD, Ray GT, Saunders K, Merrill J, Silverberg MJ, Rutter CM, Weisner C, Banta-Green C, Campbell C, Von Korff M. Trends in long-term opioid therapy for noncancer pain among persons with a history of depression. *Gen. Hosp. Psychiatry.* 2009; 31:564–570. [PubMed: 19892215]
- Bureau of the Census. American Community Survey. Bureau of the Census. Suitland, MD: 2012.
- Campbell CI, Weisner C, LeResche L, Ray GT, Saunders K, Sullivan MD, Banta-Green CJ, Merrill JO, Silverberg MJ, Boudreau D, Satre KK, Von Korff M. Age and gender trends in long-term opioid analgesic use for noncancer pain. *Am. J. Public Health.* 2010; 100:2541–2547. [PubMed: 20724688]
- Centers for Disease Control and Prevention. Unweighted Response Rates for the NHANES 2011–2012. Atlanta, GA: Centers for Disease Control and Prevention; 2013.
- Coalition Against Insurance Fraud. Prescription for Peril: How Insurance Fraud Finances Theft and Abuse of Addictive Prescription Drugs. Washington DC: Coalition Against Insurance Fraud; 2007.
- Compton WM, Conway KP, Stinson FS, Colliver JD, Grant BF. Prevalence, correlates, and comorbidity of DSM-IV antisocial personality syndromes and alcohol and specific drug use disorders in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J. Clin. Psychiatry.* 2005; 66:677–685. [PubMed: 15960559]
- Compton WM, Thomas YF, Stinson FS, Grant BF. Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch. Gen. Psychiatry.* 2007; 64:566–576. [PubMed: 17485608]
- Compton WM, Volkow ND. Abuse of prescription drugs and the risk of addiction. *Drug Alcohol Depend.* 2006; 83:S4–S7. [PubMed: 16563663]
- Creanga AA, Sabel JC, Ko JY, Wasserman CR, Shapiro-Mendoza CK, Taylor P, Barfield W, Cawthon L, Paulozzi LJ. Maternal drug use and its effect on neonates: a population-based study in Washington State. *Obstet. Gynecol.* 2012; 119:924–933. [PubMed: 22525903]
- Edlund MJ, Martin BC, Devries A, Fan MY, Braden JB, Sullivan MD. Trends in use of opioids for chronic noncancer pain among individuals with mental health and substance use disorders: the TROUP Study. *Clin. J. Pain.* 2010; 26:1–8. [PubMed: 20026946]
- Eriksen J, Sjogren P, Bruera E, Ekholm O, Rasmussen NK. Critical issues on opioids in chronic non-cancer pain: an epidemiological study. *Pain.* 2006; 125:172–179. [PubMed: 16842922]

post-traumatic stress disorder modules: substance abusers and others in a general population sample. *Drug Alcohol Depend.* 2015b; 152:246–256. [PubMed: 25939727]

Hasin DS, Stinson FS, Ogburn E, Grant BF. Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol use and dependence in the United States: results of the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch. Gen. Psychiatry.* 2007; 64:830–842. [PubMed: 17606817]

Huang B, Dawson DA, Stinson FS, Hasin DS, Ruan WJ, Saha TD, Smith SM, Goldstein RB, Grant BF. Prevalence, correlates, and comorbidity of nonmedical prescription drug use and drug use disorders in the United States: results of the National Epidemiologic Survey on Alcohol and Related Conditions. *J. Clin. Psychiatry.* 2006; 67:1062–1073. [PubMed: 16889449]

Jamison RN, Butler SF, Budman SH, Edwards RR, Wasan AD. Gender differences in risk factors for aberrant prescription opioid use. *J. Pain.* 2010; 11:312–320. [PubMed: 19944648]

Jamison RN, Edwards RR. Risk factor assessment for problematic use of opioids for chronic pain. *Clin. Neuropsychol.* 2013; 27:60–80. [PubMed: 22935011]

Jensen MK, Thomsen AB, Hojsted J. 10-year follow-up of chronic non-malignant pain patients: opioid use, health related quality of life and health care utilization. *Eur. J. Pain.* 2006; 10:423–433. [PubMed: 16054407]

Jones CM. Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers - United States, 2002–2004 and 2008–2010. *Drug Alcohol Depend.* 2013; 132:95–100. [PubMed: 23410617]

Katz C, El-Gabalawy R, Keyes KM, Martins SS, Sareen J. Risk factors for incident nonmedical prescription opioid use and abuse and dependence: results from a longitudinal nationally representative sample. *Drug Alcohol Depend.* 2013; 132:107–113. [PubMed: 23399466]

Kawa I, Carter JD, Joyce PR, Doughty CJ, Frampton CM, Wells JE, Walsh AES, Olds RJ. Gender differences in bipolar disorder: age of onset, course, comorbidity, and symptom presentation. *Bipolar Disord.* 2005; 7:119–125. [PubMed: 15762852]

Kobus AM, Smith DH, Morasco BJ, Johnson ES, Yang X, Petrik AF, Deyo RA. Correlates of higher-dose opioid medication use for low back pain in primary care. *J. Pain.* 2012; 13:1131–1138. [PubMed: 23117108]

Koyyalagunta D, Bruera E, Solanki D, Nour KH, Burton AW, Toro MP, Bruel B, Manchikanti L. A systematic review of randomized trials on effectiveness of opioids for cancer pain. *Pain Physician.* 2012; 15:ES39–ES58. [PubMed: 22786461]

Manubay J, Davidson J, Vosburg S, Jones J, Comer S, Sullivan M. Sex differences among opioid-abusing patients with chronic pain in a clinical trial. *J. Addict. Med.* 2015; 9:46–52. [PubMed: 25325300]

Martell BA, O'Connor PG, Kerns RD. Systematic review: opioid treatment for chronic back pain: prevalence, efficacy, and association with addiction. *Ann. Intern. Med.* 2007; 146:116–127. [PubMed: 17227935]

Martins SS, Fenton MC, Keyes KM, Blanco C, Zhu H, Storr CL. Mood and anxiety disorders and their association with non-medical prescription opioid use and prescription opioid-use disorder: longitudinal evidence from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychol. Med.* 2012; 42:1261–1272. [PubMed: 21999943]

Martins SS, Keyes KM, Storr CL, Zhu H, Chilcoat HD. Pathways between nonmedical opioid use/dependence and psychiatric disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug Alcohol Depend.* 2009; 103:16–24. [PubMed: 19414225]

Martins SS, Keys KM, Storr CL, Zhu H, Grucza RA. Birth-cohort trends in lifetime and past-year prescription opioid-use disorder resulting from nonmedical use: results from two national surveys. *J. Stud. Alcohol Drugs.* 2010; 71:480–487. [PubMed: 20553656]

Martins SS, Kim JH, Chen L-Y, Levin D, Keyes KM, Cerda M, Storr CL. Nonmedical prescription drug use among US young adults by educational attainment. *Soc. Psychiatry Psychiatr. Epidemiol.* 2014; 50:713–724. [PubMed: 25427665]

McHugh RK, Nielsen S, Weiss RD. Prescription drug abuse: from epidemiology to public policy. *J. Subst. Abuse Treat.* 2015; 48:1–7. [PubMed: 25239857]

- McHugh RK, DeVito EE, Dodd D, Carroll KM, Potter JS, Greenfield SF, Connery HS, Weiss RD. Gender differences in a clinical trial for prescription opioid dependence. *J. Subst. Abuse Treat.* 2013; 45:38–43. [PubMed: 23313145]
- Miller M, Sturmer T, Azrael D, Levin R, Solomon DH. Opioid analgesics and the risk of fractures in older adults with arthritis. *J. Am. Geriatr. Soc.* 2011; 59:430–438. [PubMed: 21391934]
- Muhuri, PK.; Gfroerer, JC.; Davis, MC. Associations on nonmedical pain reliever use and initiation of heroin use in the United States. Rockville, MD: Substance Abuse and Mental Health Administration and Center for Behavioral Health Statistics and Quality; 2013.
- Novak SP, Herman-Stal M, Flannery B, Zimmerman M. Physician pain, common psychiatric and substance use disorders; and the non-medical use of prescription analgesics in the United States. *Drug Alcohol Depend.* 2009; 100:63–70. [PubMed: 19010611]
- Papaleontiou M, Henderson CR, Turner BJ, Moore AA, Olkhovskaya Y, Amanfo L, Reid MC. Outcomes associated with opioid use in the treatment of chronic noncancer pain in older adults: a systematic review and meta-analysis. *J. Am. Geriatr. Soc.* 2010; 58:1353–1369. [PubMed: 20533971]
- Parsells-Kelly J, Cook SF, Kaufman DW, Anderson T, Rosenberg L, Mitchell AA. Prevalence and characteristics of opioid use in the US adult population. *Pain.* 2008; 138:507–513. [PubMed: 18342447]
- Pollini RA, Banta-Green CJ, Cuevas-Mota J, Metzner M, Teshale E, Garfein RS. Problematic use of prescription-type opioids prior to heroin use among young heroin injectors. *Subst. Abuse Rehabil.* 2011; 2:173–180. [PubMed: 23293547]
- Research Triangle Institute. SUDAAN Language Manual, Release 11.0. Research Triangle Park, NC: The Institute; 2012.
- Rolita L, Spegman A, Tang X, Cronstein BN. Greater number of narcotic analgesic prescriptions for osteoarthritis is associated with falls and fractures in elderly adults. *J. Am. Geriatr. Soc.* 2013; 61:335–340. [PubMed: 23452054]
- Safdar B, Heins A, Homel P, et al. Impact of physician and patient gender on pain management in the emergency department-a multicenter study. *Pain Med.* 2009; 10:364–372. [PubMed: 18992042]
- Schuch JJJ, Roest AM, Nolen WA, Penninx BWJH, de Jong P. Gender differences in major depressive disorder: results from the Netherlands study of depression and anxiety. *J. Affect. Disord.* 2014; 156:156–163. [PubMed: 24388685]
- Sehgal N, Colson J, Smith HS. Chronic pain treatment with opioid analgesics: benefits versus harms of long-term therapy. *Cochrane Library Expert Review Neurotherapy.* 2013; 13:1201–1220.
- Simoni-Wastila L, Yang KY. Psychoactive drug abuse in older adults. *Am. J. Geriatr. Pharma.* 2006; 4:380–394.
- Simoni-Wastila L. The use of abusable prescription drugs. The role of gender. *J. Womens Health Gend. Based Med.* 2000; 9:289–297. [PubMed: 10787224]
- Stinson FS, Grant BF, Dawson DA, Ruan WJ, Huang B, Saha T. Comorbidity between DSM-IV alcohol and specific drug use disorders in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug Alcohol Depend.* 2005; 80:105–116. [PubMed: 16157233]
- Stinson FS, Ruan WJ, Pickering R, Grant BF. Cannabis use disorders in the USA: prevalence, correlates and co-morbidity. *Psychol. Med.* 2006; 36:1447–1460. [PubMed: 16854249]
- Substance Abuse and Mental Health Administration and Center for Behavioral Health Statistics and Quality. Drug Abuse Warning Network, 2011: National Estimates of Drug-Related Emergency Department Visit. Rockville, MD: Substance Abuse and Mental Health Administration and Center for Behavioral Health Statistics and Quality; 2013.
- Substance Abuse and Mental Health Administration. Treatment Episode Data Set (TEDS) 2002–2012. Rockville, MD: Substance Abuse and Mental Health Administration; 2014.
- Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health – Detailed Tables. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014.
- Sullivan MD, Howe CQ. Opioid therapy for chronic pain in the United States: promises and perils. *Pain.* 2013; 154:594–S100.

- Tetraault JM, Desai RA, Becker WC, Fiellin DA, Concato J, Sullivan LE. Gender and non-medical use of prescription opioids: results from a national US survey. *Addiction*. 2007; 103:258–268. [PubMed: 18042194]
- Thomas E, Peat G, Harris L, Wilkie R, Croft PR. The prevalence of pain and pain interference in a general population of older adults: cross-sectional findings from the North Staffordshire Osteoarthritis Project. *Pain*. 2004; 110:361–368. [PubMed: 15275787]
- Tragesser SL, Jones RE, Robinson RJ, Stutler A, Stewart A. Borderline personality disorder and risk for prescription opioid use disorder. *J. Person. Disord*. 2013; 27:427–441.
- U.S. Department of Health and human Services. Addressing Prescription Drug Abuse in the United States: Current Activities and Future Opportunities. U.S. Washington DC: Department of Health and Human Services; 2011.
- Wang KH, Becker WC, Fiellin DA. Prevalence and correlates for nonmedical use and prescription opioids among urban and rural residents. *Drug Alcohol Depend*. 2013; 127:156–162. [PubMed: 22819293]
- Warner, M.; Hedegaard, H.; Chen, Li-Hue. Centers for Disease Control. Atlanta, GA: 2012. Trends in Drug-poisoning Deaths Involving Opioid Analgesics and Heroin: United States.
- Weisner CM, Campbell DI, Ray GT, Saunders K, Merrill JO, Banta-Green C, Sullivan MD, Silverberg MJ, Mertens JR, Boudreau D, Von Korff M. Trends in prescribed opioid therapy for non-cancer pain for individuals with prior substance use disorders. *Pain*. 2009; 145:287–293. [PubMed: 19581051]
- Weisse CS, Sorum PC, Sanders KN, Syat BL. Do gender and race affect decisions about pain management? *J. Gen. Intern. Med*. 2001; 16:211–217. [PubMed: 11318921]
- West NA, Severtson SG, Green JL, Dart RC. Trends in abuse and misuse of prescription opioids among older adults. *Drug Alcohol Depend*. 2015; 149:117–121. [PubMed: 25678441]
- Wu L-T, Blazer D. Illicit and nonmedical drug use among older adults: a review. *J. Aging Health*. 2011; 23:481–504. [PubMed: 21084724]
- Wu L-T, Blazer DG, Swartz MZ, Burchett B, Brady KT. Illicit and nonmedical drug use among Asian Americans, Native Hawaiians/Pacific Islanders, and mixed-race individuals. *Drug Alcohol Depend*. 2013; 133:360–367. [PubMed: 23890491]

Highlights

We examine prevalence, correlates, comorbidity and treatment of NMPOU.

We examine DSM-5 NMPOUD among men and women.

Prevalences of 12-month and lifetime NMPOU were greater among men than women.

Rates of NMPOUD did not differ between men and women.

MDD, persistent depression and bipolar I disorder were associated with NMPOU and NMPOUD among men.

Table 1

Prevalence and Adjusted Odds Ratios (AORs)^a of 12-Month and Lifetime Nonmedical Prescription Opioid Use Among Men and Women by Sociodemographic Characteristics

Sociodemographic Characteristic	12-Month				Lifetime			
	Men (n=744)		Women (n= 835)		Men(n=2,071)		Women (n= 2,019)	
	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)
Total	4.4 (0.19)	-	3.9 (0.20)	-	13.0 (0.40)	-	9.8 (0.43)	-
Race-ethnicity								
White	4.6 (0.26)	1.00 (Reference)	3.9 (0.23)	1.00 (Reference)	14.7 (0.53)	1.00 (Reference)	11.0 (0.5)	1.00 (Reference)
Black	5.3 (0.55)	0.84 (0.66–1.07)	5.1 (0.60)	1.14 (0.84–1.55)	10.8 (0.88)	0.57 (0.47–0.69)	9.1 (0.99)	0.69 (0.54–0.89)
Native American	9.3 (2.60) ^b	1.69 (0.89–3.20)	3.5 (1.06) ^b	0.76 (0.40–1.43)	19.1 (3.51) ^b	1.18 (0.74–1.86)	10.6 (2.24) ^b	0.83 (0.52–1.33)
Asian/Pacific Islander	1.6 (0.37)	0.29 (0.17–0.49)	1.5 (0.46)	0.34 (0.19–0.64)	5.8 (0.86)	0.31 (0.23–0.43)	3.3 (0.57)	0.23 (0.16–0.34)
Hispanic	3.3 (0.38)	0.49 (0.36–0.66)	3.4 (0.34)	0.68 (0.53–0.88)	9.3 (0.67)	0.47 (0.39–0.56)	6.9 (0.54)	0.47 (0.39–0.57)
Age, y								
18–29	6.4 (0.47)	1.73 (1.37–2.20)	4.9 (0.44)	1.53 (1.21–1.93)	16.8 (0.71)	1.70 (1.46–1.97)	12.8 (0.79)	1.76 (1.50–2.07)
30–44	4.7 (0.42)	1.60 (1.23–2.07)	4.1 (0.29)	1.42 (1.15–1.75)	14.6 (0.73)	1.67 (1.45–1.91)	10.6 (0.53)	1.52 (1.31–1.77)
45	3.3 (0.26)	1.00 (Reference)	3.3 (0.23)	1.00 (Reference)	10.5 (0.46)	1.00 (Reference)	8.2 (0.46)	1.00 (Reference)
Marital status								
Married/cohabiting	5.1 (0.55)	1.00 (Reference)	4.4 (0.49)	1.00 (Reference)	11.9 (0.87)	1.00 (Reference)	9.3 (0.83)	1.00 (Reference)
Widowed/separated/divorced	6.0 (0.41)	1.31 (1.03–1.66)	4.1 (0.36)	1.23 (0.97–1.57)	14.8 (0.64)	1.49 (1.26–1.75)	9.6 (0.61)	1.18 (1.01–1.37)
Never married	3.5 (0.22)	1.25 (0.97–1.63)	3.6 (0.23)	1.07 (0.86–1.33)	12.4 (0.48)	1.21 (1.03–1.43)	9.9 (0.47)	1.02 (0.86–1.21)
Education								
Less than high school	3.3 (0.25)	1.28 (1.01–1.64)	3.2 (0.24)	1.09 (0.85–1.39)	10.7 (0.52)	0.92 (0.76–1.12)	8.7 (0.51)	0.97 (0.80–1.18)
High school	5.2 (0.47)	1.54 (1.26–1.88)	4.5 (0.32)	1.05 (0.84–1.30)	16.2 (0.79)	1.14 (1.00–1.30)	10.6 (0.54)	0.95 (0.82–1.10)
Some college or higher	6.4 (0.45)	1.00 (Reference)	4.8 (0.44)	1.00 (Reference)	16.5 (0.67)	1.00 (Reference)	11.6 (0.70)	1.00 (Reference)
Family income								
0–19,999	7.9 (0.53)	2.40 (1.80–3.20)	5.6 (0.43)	1.75 (1.32–2.31)	17.5 (0.76)	1.77 (1.49–2.11)	12.3 (0.69)	1.61 (1.31–1.96)
20,000–34,999	4.4 (0.40)	1.39 (1.04–1.86)	3.9 (0.36)	1.24 (0.93–1.65)	14.1 (0.70)	1.40 (1.19–1.65)	9.8 (0.64)	1.27 (1.03–1.56)
35,000–69,999	3.9 (0.33)	1.31 (0.99–1.74)	3.2 (0.33)	1.05 (0.79–1.40)	12.4 (0.65)	1.21 (1.02–1.43)	9.1 (0.60)	1.13 (0.97–1.33)

Sociodemographic Characteristic	12-Month				Lifetime			
	Men (n=744)		Women (n= 835)		Men(n=2,071)		Women (n= 2,019)	
	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)
70,000	2.7 (0.29)	1.00 (Reference)	2.9 (0.29)	1.00 (Reference)	10.1 (0.63)	1.00 (Reference)	8.1 (0.59)	1.00 (Reference)
Urbanicity								
Urban	4.4 (0.23)	1.15 (0.84–1.57)	3.9 (0.23)	1.06 (0.78–1.44)	12.9 (0.46)	1.07 (0.89–1.28)	10.0 (0.50)	1.23 (0.96–1.57)
Rural	4.3 (0.58)	1.00 (Reference)	3.6 (0.46)	1.00 (Reference)	13.1 (0.88)	1.00 (Reference)	8.9 (0.86)	1.00 (Reference)
Region								
Northeast	3.1 (0.50)	0.62 (0.44–0.89)	3.4 (0.39)	0.72 (0.52–1.01)	12.0 (0.74)	0.79 (0.65–0.96)	9.0 (0.94)	0.76 (0.57–1.02)
Midwest	4.8 (0.50)	0.89 (0.68–1.16)	4.2 (0.53)	0.85 (0.59–1.22)	13.6 (1.27)	0.83 (0.65–1.06)	10.3 (1.39)	0.82 (0.58–1.17)
South	4.6 (0.31)	0.85 (0.67–1.07)	3.6 (0.27)	0.71 (0.53–0.96)	12.5 (0.56)	0.81 (0.69–0.94)	9.3 (0.52)	0.78 (0.62–0.97)
West	4.6 (0.31)	1.00 (Reference)	4.3 (0.46)	1.00 (Reference)	13.8 (0.58)	1.00 (Reference)	10.6 (0.75)	1.00 (Reference)

^aControlling for other sociodemographic characteristics.

^bLow precision.

Table 2

Prevalence and Adjusted Odds Ratios (AORs)_a of 12-Month and Lifetime DSM-5 Nonmedical Prescription Opioid Use Disorder Among Men and Women by Sociodemographic Characteristics

Sociodemographic Characteristic	12-Month				Lifetime			
	Men (n= 154)		Women (n= 176)		Men (n=340)		Women (n=358)	
	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)
Total	0.9 (0.08)		0.9 (0.08)		2.2 (0.13)	-	1.9 (0.12)	-
Race-ethnicity								
White	1.0 (0.11)	1.00 (Reference)	0.9 (0.10)	1.00 (Reference)	2.5 (0.17)	1.00 (Reference)	2.3 (0.17)	1.00 (Reference)
Black	0.9 (0.19)	0.52 (0.31–0.87)	1.2 (0.20)	1.05 (0.68–1.63)	1.7 (0.34)	0.44 (0.28–0.69)	1.5 (0.23)	0.48 (0.33–0.71)
Native American	2.8 (1.37) ^b	1.89 (0.67–5.37)	0.5 (0.26)	0.43 (0.13–1.37)	6.1 (1.81) ^b	1.89 (0.99–3.58)	2.0 (1.05)	0.68 (0.23–1.98)
Asian/Pacific Islander	0.2 (0.10)	0.12 (0.03–0.47)	0.2 (0.16)	0.20 (0.03–1.53)	0.5 (0.24)	0.15 (0.05–0.44)	0.4 (0.20)	0.15 (0.05–0.45)
Hispanic	0.6 (0.18)	0.31 (0.16–0.62)	0.8 (0.18)	0.69 (0.39–1.22)	1.3 (0.29)	0.31 (0.18–0.51)	1.2 (0.21)	0.35 (0.23–0.52)
Age, y								
18–29	1.2 (0.18)	1.75 (1.06–2.88)	1.1 (0.21)	1.65 (0.88–3.09)	3.1 (0.35)	2.27 (1.51–3.41)	2.7 (0.33)	2.26 (1.48–3.45)
30–44	0.9 (0.18)	1.59 (0.94–2.71)	0.9 (0.17)	1.60 (0.93–2.75)	2.6 (0.28)	2.07 (1.53–2.80)	2.4 (0.26)	2.20 (1.57–3.10)
45	0.8 (0.11)	1.00 (Reference)	0.7 (0.10)	1.00 (Reference)	1.6 (0.18)	1.00 (Reference)	1.4 (0.15)	1.00 (Reference)
Marital status								
Married/cohabiting	1.6 (0.28)	1.00 (Reference)	1.4 (0.29)	1.00 (Reference)	3.0 (0.37)	1.00 (Reference)	2.5 (0.40)	1.00 (Reference)
Widowed/separated/divorced	1.3 (0.21)	1.12 (0.66–1.90)	1.1 (0.16)	1.45 (0.94–2.26)	3.1 (0.30)	1.56 (1.10–2.21)	2.1 (0.24)	1.19 (0.87–1.62)
Never married	0.6 (0.08)	0.61 (0.39–0.94)	0.7 (0.08)	1.12 (0.70–1.79)	1.6 (0.15)	0.87 (0.57–1.32)	1.7 (0.14)	0.96 (0.67–1.39)
Education								
Less than high school	0.8 (0.11)	2.07 (1.14–3.76)	0.7 (0.09)	1.68 (0.96–2.93)	1.7 (0.15)	1.64 (1.11–2.43)	1.7 (0.14)	1.43 (0.94–2.15)
High school	1.4 (0.25)	1.94 (1.24–3.05)	1.2 (0.16)	1.38 (0.94–2.03)	3.3 (0.44)	1.70 (1.24–2.33)	2.2 (0.26)	1.15 (0.86–1.55)
Some college or higher	1.0 (0.16)	1.00 (Reference)	1.1 (0.18)	1.00 (Reference)	2.7 (0.32)	1.00 (Reference)	2.4 (0.30)	1.00 (Reference)
Family income								
0–19,999	2.4 (0.32)	7.52 (3.09–18.32)	1.4 (0.19)	2.09 (1.14–3.82)	4.1 (0.42)	3.64 (2.09–6.32)	2.9 (0.27)	2.45 (1.67–3.60)
20,000–34,999	0.9 (0.16)	2.71 (1.21–6.11)	0.9 (0.19)	1.51 (0.77–2.95)	2.6 (0.39)	2.35 (1.38–3.98)	2.0 (0.30)	1.69 (1.10–2.60)
35,000–69,999	0.6 (0.15)	1.90 (0.89–4.05)	0.7 (0.13)	1.21 (0.62–2.36)	2.0 (0.23)	1.77 (1.07–2.95)	1.8 (0.20)	1.50 (1.07–2.12)

Sociodemographic Characteristic	12-Month				Lifetime			
	Men(n= 154)		Women (n= 176)		Men(n=330)		Women (n=358)	
	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)	Prevalence % (SE)	AOR (95% CI)
70,000	0.3 (0.09)	1.00 (Reference)	0.5 (0.13)	1.00 (Reference)	1.0 (0.18)	1.00 (Reference)	1.2 (0.17)	1.00 (Reference)
Urbanicity								
Urban	1.0 (0.09)	2.07 (1.23–3.50)	0.8 (0.08)	0.77 (0.48–1.24)	2.2 (0.15)	1.34 (0.94–1.90)	1.8 (0.13)	0.95 (0.68–1.34)
Rural	0.7 (0.15)	1.00 (Reference)	1.1 (0.22)	1.00 (Reference)	2.1 (0.31)	1.00 (Reference)	2.2 (0.31)	1.00 (Reference)
Region								
Northeast	0.9 (0.21)	0.93 (0.53–1.65)	0.8 (0.20)	0.96 (0.46–2.01)	2.4 (0.35)	1.02 (0.71–1.46)	1.9 (0.27)	0.92 (0.63–1.35)
Midwest	0.8 (0.21)	0.71 (0.40–1.28)	1.0 (0.12)	1.13 (0.62–2.08)	2.1 (0.29)	0.74 (0.51–1.07)	1.9 (0.21)	0.79 (0.56–1.13)
South	0.9 (0.12)	0.73 (0.49–1.09)	0.9 (0.13)	0.92 (0.49–1.73)	2.1 (0.21)	0.77 (0.58–1.04)	2.0 (0.23)	0.89 (0.61–1.29)
West	1.0 (0.16)	1.00 (Reference)	0.7 (0.18)	1.00 (Reference)	2.3 (0.24)	1.00 (Reference)	1.9 (0.21)	1.00 (Reference)

^aControlling for other sociodemographic characteristics.

^bLow precision.

Table 3

Adjusted Odds Ratios (AORs)^a of 12-Month and Lifetime Nonmedical Prescription Opioid Use/DSM-5 Nonmedical Prescription Opioid Use Disorder and Psychiatric Disorders Among Men and Women

Comorbid disorder	Opioid Use				Opioid Use Disorder			
	12-Month		Lifetime		12-Month		Lifetime	
	Men	Women	Men	Women	Men	Women	Men	Women
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Any substance use disorder	3.22 (2.58–4.02)	2.93 (2.40–3.56)	3.50 (2.94–4.17)	2.95 (2.50–3.48)	3.85 (2.30–6.42)	5.03 (3.55–7.13)	9.08 (4.92–16.76)	7.49 (5.07–
Alcohol use disorder	1.81 (1.41–2.32)	1.81 (1.46–2.25)	1.78 (1.52–2.07)	1.80 (1.54–2.09)	1.55 (0.96–2.51)	1.53 (0.99–2.37)	1.81 (1.29–2.54)	2.16 (1.53–3.05)
Any drug use disorder	3.21 (2.39–4.31)	4.85 (3.50–6.71)	3.55 (3.02–4.17)	3.80 (3.23–4.47)	6.73 (4.11–11.03)	7.69 (5.22–11.32)	5.17 (3.44–7.77)	5.56 (4.04–7.66)
Any other nonmedical prescription drug use disorder (DUD)	11.87 (6.64–21.19)	10.82 (6.65–17.59)	6.88 (5.31–8.92)	7.32 (5.62–9.53)	25.61 (12.75–51.44)	15.59 (8.66–28.06)	12.35 (8.42–18.12)	12.41 (8.52–18.08)
Any drug use disorder except nonmedical prescription DUDs	2.73 (2.03–3.67)	3.13 (2.17–4.51)	3.20 (2.67–3.82)	3.03 (2.53–3.64)	4.41 (2.54–7.65)	4.41 (2.74–7.10)	4.52 (3.04–6.72)	3.71 (2.74–5.03)
Nicotine use disorder	2.03 (1.60–2.56)	1.80 (1.50–2.17)	1.91 (1.67–2.18)	1.75 (1.52–2.02)	2.28 (1.48–3.52)	2.47 (1.61–3.78)	1.87 (1.31–2.68)	1.94 (1.41–2.67)
Any mood disorder	1.84 (1.42–2.37)	1.44 (1.17–1.78)	1.32 (1.13–1.54)	1.13 (0.95–1.33)	2.95 (1.65–5.27)	2.14 (1.33–3.43)	2.13 (1.50–3.02)	1.28 (0.90–1.82)
Major depressive disorder	1.40 (1.04–1.89)	1.18 (0.92–1.51)	1.18 (1.00–1.39)	1.02 (0.88–1.20)	1.12 (0.46–2.73)	1.34 (0.77–2.33)	1.14 (0.74–1.77)	0.92 (0.66–1.28)
Persistent depression	1.90 (1.22–2.95)	1.13 (0.78–1.65)	1.44 (1.11–1.87)	1.17 (0.96–1.42)	2.85 (1.18–6.88)	1.13 (0.62–2.04)	1.60 (1.04–2.46)	0.96 (0.63–1.47)
Bipolar I	1.35 (0.82–2.22)	1.22 (0.77–1.93)	1.06 (0.81–1.39)	1.15 (0.85–1.55)	1.86 (0.99–3.49)	1.61 (0.71–3.68)	1.61 (1.02–2.54)	1.44 (0.85–2.42)
Bipolar II	1.08 (0.36–3.21)	1.37 (0.48–3.91)	1.29 (0.63–2.67)	1.16 (0.52–2.57)	0.34 (0.04–2.95)	3.20 (0.80–12.87)	0.59 (0.15–2.34)	1.76 (0.55–5.58)
Any anxiety disorder	1.08 (0.79–1.48)	1.16 (0.94–1.42)	1.09 (0.92–1.29)	1.02 (0.86–1.21)	1.44 (0.81–2.59)	1.45 (0.83–2.51)	0.99 (0.68–1.44)	1.70 (1.22–2.38)
Panic	1.21 (0.74–1.98)	1.01 (0.70–1.44)	1.28 (0.95–1.73)	1.05 (0.87–1.27)	1.76 (0.70–4.44)	1.21 (0.65–2.25)	1.51 (0.88–2.58)	1.22 (0.85–1.75)
Agoraphobia	0.79 (0.45–1.39)	1.01 (0.67–1.52)	0.95 (0.63–1.43)	1.38 (1.01–1.89)	0.55 (0.17–1.82)	1.54 (0.82–2.89)	0.45 (0.17–1.19)	1.87 (1.13–3.11)
Social phobia	0.91 (0.55–1.51)	0.98 (0.67–1.42)	1.09 (0.80–1.48)	1.20 (0.95–1.51)	0.78 (0.34–1.82)	1.23 (0.70–2.16)	0.89 (0.49–1.59)	1.16 (0.78–1.72)
Specific phobia	1.05 (0.66–1.68)	0.81 (0.59–1.10)	1.00 (0.75–1.33)	0.83 (0.68–1.01)	1.25 (0.54–2.88)	0.92 (0.56–1.52)	0.87 (0.49–1.57)	1.04 (0.75–1.45)
Generalized anxiety disorder	0.80 (0.52–1.22)	1.32 (0.95–1.83)	0.77 (0.59–1.02)	1.09 (0.88–1.34)	0.57 (0.29–1.11)	1.23 (0.60–2.51)	0.67 (0.43–1.03)	1.29 (0.87–1.92)
Posttraumatic stress disorder	1.47 (1.04–2.09)	1.41 (1.05–1.91)	1.26 (0.96–1.65)	1.37 (1.13–1.66)	1.25 (0.64–2.44)	1.90 (1.12–3.22)	1.53 (1.08–2.17)	1.80 (1.28–2.52)
Any personality disorder	1.93 (1.52–2.45)	1.45 (1.13–1.86)	2.23 (1.90–2.61)	1.69 (1.40–2.03)	2.20 (1.33–3.63)	1.88 (1.11–3.19)	2.91 (2.00–4.21)	2.22 (1.58–3.12)
Schizotypal	1.55 (1.19–2.01)	1.27 (0.89–1.79)	1.39 (1.09–1.78)	1.34 (1.03–1.74)	1.43 (0.88–2.32)	1.45 (0.75–2.81)	1.72 (1.18–2.50)	1.09 (0.75–1.58)
Borderline	1.52 (1.12–2.06)	1.28 (0.94–1.74)	1.52 (1.19–1.94)	1.44 (1.20–1.73)	1.93 (1.05–3.52)	1.70 (0.94–3.08)	1.55 (0.99–2.43)	1.91 (1.26–2.88)

Comorbid disorder	Opioid Use				Opioid Use Disorder			
	12-Month		Lifetime		12-Month		Lifetime	
	Men	Women	Men	Women	Men	Women	Men	Women
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Antisocial	1.75 (1.37–2.23)	1.29 (0.94–1.78)	2.22 (1.80–2.72)	2.06 (1.62–2.62)	1.95 (1.26–3.01)	1.15 (0.77–1.73)	2.77 (1.96–3.91)	1.86 (1.31–2.65)

^aControlling for sociodemographic characteristics and other psychiatric disorders.

Table 4

Opioid-Specific Treatment/ Help-Seeking Among Men and Women with 12-Month and Lifetime Nonmedical Prescription Opioid Use/DSM-5 Nonmedical Prescription Opioid Use Disorder

Treatment/Help-Seeking Setting	Opioid Use				Opioid Use Disorder			
	12-Month % (se)		Lifetime % (se)		12-Month % (se)		Lifetime % (se)	
	Men	Women	Men	Women	Men	Women	Men	Women
12-step program	2.0 (0.71)	2.3 (0.71)	4.8 (0.71)	4.4 (0.67)	8.0 (3.09)	9.0 (2.82)	18.4 (2.89)	18.2 (2.45)
Family/social services	0.4 (0.26)	0.3 (0.22)	0.9 (0.29)	1.7 (0.42)	1.8 (1.22)	1.5 (0.93)	4.5 (1.54)	5.7 (1.13)
Detoxification	1.1 (0.48)	1.2 (0.46)	2.7 (0.50)	2.7 (0.45)	4.4 (2.05)	5.4 (1.92)	9.6 (2.04)	11.0 (1.71)
Other inpatient facility	0.7 (0.37)	0.8 (0.38)	1.8 (0.45)	1.5 (0.32)	3.1 (1.78)	3.5 (1.63)	5.2 (1.57)	7.1 (1.63)
Outpatient clinic	0.9 (0.39)	1.0 (0.34)	2.3 (0.41)	2.5 (0.33)	2.7 (1.63)	4.0 (1.44)	9.8 (1.98)	12.2 (1.67)
Rehabilitation program	1.8 (0.71)	0.8 (0.31)	3.4 (0.56)	3.1 (0.56)	4.6 (2.54)	3.5 (1.35)	11.7 (2.23)	13.2 (2.31)
Methadone maintenance	0.3 (0.18)	0.7 (0.35)	0.7 (0.23)	1.5 (0.32)	0.7 (0.50)	3.3 (1.51)	3.2 (1.26)	7.0 (1.50)
Emergency department	1.0 (0.43)	1.1 (0.52)	1.5 (0.36)	2.0 (0.35)	4.7 (2.05)	4.9 (2.20)	5.6 (1.52)	9.8 (1.74)
Halfway house	-	0.1 (0.08)	0.8 (0.28)	0.5 (0.17)	-	0.4 (0.36)	2.1 (0.88)	2.1 (0.84)
Crisis center	0.5 (0.29)	0.1 (0.13)	0.4 (0.15)	0.3 (0.11)	1.5 (1.07)	0.6 (0.58)	1.6 (0.64)	1.1 (0.47)
Employee assistance program	-	-	0.1 (0.09)	0.4 (0.18)	-	-	-	1.3 (0.75)
Clergy	0.9 (0.72)	0.4 (0.23)	0.7 (0.28)	0.8 (0.24)	-	1.6 (1.02)	2.0 (1.45)	3.6 (0.98)
Physician/ other health care practitioner	3.1 (0.95)	3.4 (0.85)	3.1 (0.47)	4.0 (0.55)	7.9 (2.81)	12.7 (3.19)	12.0 (2.47)	15.9 (2.34)
Other	-	1.0 (0.43)	0.3 (0.17)	0.9 (0.27)	-	4.1 (1.83)	0.5 (0.33)	4.3 (1.32)
Any treatment/Help-Seeking Setting	6.2 (1.20)	4.7 (0.98)	7.6 (0.73)	8.2 (0.79)	18.1 (4.08)	17.3 (3.52)	26.8 (2.94)	31.1 (2.71)

Note: -, Zero prevalence.

Table 5

Mean Norm-Based Disability Scores by Frequency of 12-Month NMPOU and Severity of 12-Month DSM-5 NMPOUD Among Men and Women

NMPOU	Mean Norm-Based Score (SE)									
	Mental Health		Social Functioning		Role Emotional Functioning		Bodily Pain		Mental Component Summary	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
No NMPOU	53.2 (0.11)	50.9 (0.11)	51.7 (0.12)	50.2 (0.11)	49.6 (0.15)	47.9 (0.13)	50.6 (0.16)	49.4 (0.14)	52.2 (0.11)	50.1 (0.10)
NMPOU	47.0 (0.47) ^a	44.9 (0.62) ^a	46.3 (0.55) ^a	43.6 (0.55) ^a	43.7 (0.61) ^a	41.4 (0.53) ^a	43.3 (0.87) ^a	42.6 (0.69) ^a	46.4 (0.47) ^a	43.9 (0.55) ^a
Once a month or less	48.8 (0.59) ^c	46.4 (0.72)	49.4 (0.54)	46.9 (0.69)	47.3 (0.61)	45.1 (0.70)	47.3 (0.69) ^a	47.6 (0.73) ^c	48.4 (0.57)	45.6 (0.75)
2–8 times a month	48.1 (1.08)	44.3 (1.41)	48.4 (0.80)	40.9 (1.42) ^a	44.8 (1.09)	39.1 (1.38) ^a	46.8 (1.22)	40.9 (1.36) ^a	47.3 (0.97)	42.6 (1.31) ^c
3–4 times a week	45.4 (1.95) ^c	43.0 (1.94) ^c	44.2 (2.29) ^c	44.9 (1.87)	41.8 (1.72) ^b	41.4 (1.69)	42.9 (2.25) ^c	43.2 (1.61)	44.4 (1.89) ^c	43.4 (1.94)
Every day or nearly everyday	42.5 (0.91) ^a	43.3 (1.00) ^a	39.0 (1.38) ^a	39.2 (1.08) ^a	35.8 (1.29) ^a	36.1 (0.90) ^a	32.6 (1.55) ^a	35.0 (1.55) ^a	42.1 (1.04) ^a	41.9 (1.01) ^a
NMPOUD										
No NMPOUD	53.0 (0.11)	50.8 (0.11)	51.5 (0.12)	50.1 (0.11)	49.4 (0.15)	47.8 (0.13)	50.4 (0.16)	49.2 (0.14)	51.9 (0.11)	50.0 (0.10)
Any	41.7 (0.90) ^a	39.3 (1.25) ^a	38.3 (1.26) ^a	36.8 (1.23) ^a	38.0 (1.14) ^a	35.0 (1.00) ^a	36.0 (1.42) ^a	36.5 (1.33) ^a	41.4 (1.07) ^a	38.1 (1.12) ^a
Mild (2–3 criteria)	45.8 (1.40)	40.9 (1.68) ^c	43.1 (1.26) ^b	38.0 (1.61) ^b	41.6 (1.68)	36.4 (1.46) ^b	38.3 (1.98) ^a	38.7 (1.28) ^a	45.9 (1.48)	39.4 (1.49) ^b
Moderate (4–5 criteria)	38.2 (1.80) ^a	39.8 (2.22)	34.7 (2.97) ^a	36.7 (2.51) ^b	31.7 (2.97) ^a	34.7 (2.48) ^b	30.2 (2.61) ^a	30.5 (3.43) ^a	37.9 (2.17) ^b	39.4 (2.09)
Severe (6 + criteria)	37.8 (1.99) ^a	36.2 (2.37)	33.2 (2.46) ^a	34.8 (2.54) ^c	36.4 (1.71) ^a	33.0 (1.97) ^b	36.2 (2.61) ^a	36.9 (2.71) ^b	36.8 (2.11) ^a	35.0 (2.30)

Note: NMPOU - Nonmedical Prescription Opioid Use; NMPOUD - Nonmedical Prescription Opioid Use Disorder

^aSignificantly different ($p < 0.001$) from score for individuals with no opioid use/no opioid use disorder, after adjusting for sociodemographic characteristics and 12-month psychiatric comorbidity.

^bSignificantly different ($p < 0.01$) from score for individuals with no opioid use/no opioid use disorder, after adjusting for sociodemographic characteristics and 12-month psychiatric comorbidity.

^cSignificantly different ($p < 0.05$) from score for individuals no opioid use/no opioid use disorder, after adjusting for sociodemographic characteristics