

It is illegal to post this copyrighted PDF on any website.

**CME Background**

Articles are selected for credit designation based on an assessment of the educational needs of CME participants, with the purpose of providing readers with a curriculum of CME articles on a variety of topics throughout each volume. Activities are planned using a process that links identified needs with desired results.

To obtain credit, read the article, correctly answer the questions in the Posttest, and complete the Evaluation. A \$5 processing fee will apply.

**CME Objective**

After studying this article, you should be able to:

- Systematically screen patients for nonmedical prescription opioid use disorder

**Accreditation Statement**

The CME Institute of Physicians Postgraduate Press, Inc., is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.



**Credit Designation**

The CME Institute of Physicians Postgraduate Press, Inc., designates this journal-based CME activity for a maximum of 1 *AMA PRA Category 1 Credit*<sup>™</sup>. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

*Note:* The American Academy of Physician Assistants (AAPA) accepts certificates of participation for educational activities certified for *AMA PRA Category 1 Credit*<sup>™</sup> from organizations accredited by ACCME or a recognized state medical society. Physician assistants may receive a maximum of 1 hour of Category I credit for completing this program.

**Date of Original Release/Review**

This educational activity is eligible for *AMA PRA Category 1 Credit*<sup>™</sup> through June 30, 2018. The latest review of this material was April 2016.

**Financial Disclosure**

All individuals in a position to influence the content of this activity were asked to complete a statement regarding all relevant personal financial relationships between themselves or their spouse/partner and any commercial interest. The CME Institute has resolved any conflicts of interest that were identified. In the past year, Alan J. Gelenberg, MD, has been a consultant for Zynx Health, has been a stock shareholder of Healthcare Technology Systems, and has participated in antitrust litigation on behalf of GlaxoSmithKline. No member of the CME Institute staff reported any relevant personal financial relationships. **Faculty financial disclosure appears at the end of the article.**

# Nonmedical Prescription Opioid Use and *DSM-5* Nonmedical Prescription Opioid Use Disorder in the United States

Tulshi D. Saha, PhD<sup>a,\*</sup>; Bradley T. Kerridge, PhD<sup>b</sup>; Risë B. Goldstein, PhD, MPH<sup>a</sup>; S. Patricia Chou, PhD<sup>a</sup>; Haitao Zhang, PhD<sup>a</sup>; Jeeseun Jung, PhD<sup>a</sup>; Roger P. Pickering, MS<sup>a</sup>; W. June Ruan, MA<sup>a</sup>; Sharon M. Smith, PhD<sup>a</sup>; Boji Huang, MD, PhD<sup>a</sup>; Deborah S. Hasin, PhD<sup>c</sup>; and Bridget F. Grant, PhD, PhD<sup>a</sup>

**ABSTRACT**

**Objective:** The authors present 12-month and lifetime prevalence, correlates, psychiatric comorbidity, and treatment of nonmedical prescription opioid use (NMPOU) and *DSM-5* NMPOU disorder (NMPOUD).

**Methods:** Data were derived from the 2012–2013 National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III) (N = 36,309).

**Results:** Prevalences of 12-month and lifetime NMPOU were 4.1% and 11.3%, exceeding rates in the 2001–2002 NESARC (1.8%, 4.7%). Twelve-month and lifetime rates of *DSM-5* NMPOUD were 0.9% and 2.1%. NESARC-III *DSM-IV* NMPOUD rates (0.8%, 2.9%) were greater than those observed in the 2001–2002 NESARC (0.4% and 1.4%). Rates of NMPOU were greater among men, but no sex differential was observed for NMPOUD. Prevalences of NMPOU and NMPOUD were generally greater among 18- to 64-year-old individuals, whites, and Native Americans, and individuals with lower socioeconomic status. Associations were observed between 12-month and lifetime NMPOU and NMPOUD and other drug use disorders, posttraumatic stress disorder, and borderline, schizotypal, and antisocial personality disorders; persistent depression and major depressive disorder (for NMPOU); and bipolar I disorder (for NMPOUD). Only 5.5% and 17.7% of individuals with 12-month NMPOU and NMPOUD were ever treated.

**Conclusions:** NMPOU and NMPOUD have considerably increased over the past decade, are associated with a broad array of risk factors and comorbidities, and largely go untreated in the United States. More information on the determinants, characteristics, and outcomes of NMPOU and NMPOUD is needed to support evidence-based interventions and prevention.

*J Clin Psychiatry* 2016;77(6):772–780  
dx.doi.org/10.4088/JCP.15m10386

© Copyright 2016 Physicians Postgraduate Press, Inc.

<sup>a</sup>Laboratory of Epidemiology and Biometry, Division of Intramural Clinical and Biological Research, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, Rockville, Maryland

<sup>b</sup>Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, New York

<sup>c</sup>Department of Psychiatry, College of Physicians and Surgeons, Mailman School of Public Health, Columbia University; and New York State Psychiatric Institute, New York

\*Corresponding author: Tulshi D. Saha, PhD, Laboratory of Epidemiology and Biometry, Division of Intramural Clinical and Biological Research, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, 5635 Fishers Ln, Room 3083, Rockville, MD 20852 (sahatd@mail.nih.gov).

Although opioid analgesics are important components of treatment for chronic pain, which is highly prevalent among American adults,<sup>1</sup> prescriptions for opioid analgesics and harms from nonmedical prescription opioid use (NMPOU) have increased dramatically during the last decade. Between 2002 and 2012, the number of opioid analgesics dispensed by US pharmacies has skyrocketed from 142 million to 248

It is illegal to post this copyrighted PDF on any website.

**It is illegal to post this copyrighted PDF on any website.**

million.<sup>2,3</sup> Drug-poisoning death rates more than tripled between 1999 and 2012,<sup>4</sup> the quarterly intentional abuse rates associated with opioids reported by US poison centers increased from 0.20/100,000 population to 0.56/100,000 population in 2012,<sup>2</sup> and emergency department visits increased by 153% from 2004 to 2011.<sup>5</sup> Drug treatment admission rates for nonheroin opiates increased by 236% from 2002 to 2012.<sup>6</sup> Additional adverse health consequences of NMPOU include transitions to injection drug or heroin use with resultant infection (eg, hepatitis C, human immunodeficiency virus)<sup>6-9</sup>; risk, falls, and fractures among older adults<sup>10,11</sup>; neonatal opioid withdrawal syndrome<sup>12</sup>; cognitive impairment<sup>13</sup>; and drug interactions.<sup>13</sup> Societal costs of NMPOU are estimated at \$53 billion to \$72 billion annually.<sup>14-16</sup>

Considerable concern stems from the dependence potential of NMPOU and the severity and disability of NMPOU disorder (NMPOUD) attributable to its comorbidity with other substance use and psychiatric disorders.<sup>17,18</sup> Although research has begun to identify correlates of NMPOU,<sup>19-21</sup> very few surveys<sup>22,23</sup> collect clinically relevant diagnostic information on NMPOUD and its comorbidities. In the 2001–2002 National Institute on Alcohol Abuse and Alcoholism (NIAAA) National Epidemiologic Survey on Alcohol and Related Conditions (NESARC),<sup>24</sup> 12-month and lifetime rates of *DSM-IV*<sup>25</sup> NMPOUD (abuse and/or dependence) were 0.34% and 1.4%,<sup>22</sup> with substantial comorbidity between NMPOUD and major mood, anxiety, personality, and other substance use disorders.<sup>22,26-30</sup> In the 2013 National Survey on Drug Use and Health (NSDUH), the 12-month prevalence of NMPOUD was 0.6%.<sup>23</sup> The NSDUH assesses only 12-month NMPOUD and does not address lifetime diagnoses or the full range of psychiatric disorders.

Previous national estimates of NMPOUD were all based on *DSM-IV* criteria. However, *DSM-5*<sup>31</sup> 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  $\geq 2$  criteria.<sup>32</sup> Because of the seriousness of NMPOU and NMPOUD, the lack of current epidemiologic data on NMPOU and *DSM-5* NMPOUD in the United States from a single reliable and uniform source represents a critical knowledge gap for prevention and intervention. We therefore present national data on the prevalence, correlates, comorbidity, and treatment of NMPOU and *DSM-5* NMPOUD from the 2012–2013 NIAAA NESARC-III.<sup>33</sup> *DSM-IV* NMPOUD criteria were also assessed to examine trends.

## METHODS

### Sample

The target population for NESARC-III was the US noninstitutionalized adult civilian population, including residents of selected group quarters. As detailed elsewhere,<sup>33</sup> probability sampling was used to select respondents. Primary sampling units were counties or groups of contiguous counties,

- Lack of current epidemiologic data on nonmedical prescription opioid use (NMPOU) and *DSM-5* NMPOU disorder (NMPOUD) from a single reliable source represents a knowledge gap for prevention and treatment.
- Given the dramatic increases in NMPOU and NMPOUD over the last decade, it is important for clinicians to systematically screen for these conditions and educate patients about their risks.

secondary sampling units comprised groups of Census-defined blocks, and tertiary sampling units were households within secondary sampling units. Eligible adults within sampled households were randomly selected. Hispanics, blacks, and Asians were oversampled; in households with  $\geq 4$  eligible minority persons, 2 respondents were selected ( $n = 1,661$ ). 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 US national surveys.<sup>23,34</sup>

Data were adjusted for oversampling and nonresponse, then weighted to represent the US civilian population based on the 2012 American Community Survey.<sup>35</sup> Weighting adjustments compensated adequately for nonresponse. Respondents did not differ from the total eligible sample, including nonrespondents, in percentage of Hispanics, blacks, or Asians; population density; vacancy rate; proportion of population in group quarters; or proportion of renters at the segment level. There were no differences between respondents and the total eligible sample on Hispanic ethnicity. Respondents in comparison to the eligible sample included slightly higher percentages of men (48.1% vs 46.2%) and individuals aged 60–69 years (13.7% vs 12.6%) and smaller percentages of individuals aged 40–49 (18.1% vs 18.3%) and 30–39 (16.7% vs 17.4%) years.

Respondents gave informed consent and received \$90.00 for survey participation. Protocols were approved by National Institutes of Health and Westat institutional review boards.

### Assessments

The diagnostic interview was the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule-5 (AUDADIS-5),<sup>36</sup> designed to measure *DSM-5* alcohol use disorder, nicotine use disorder, other specific drug use disorders, and selected mood, anxiety, trauma-related, eating, and personality disorders.

### Nonmedical Prescription Opioid Use and Nonmedical Prescription Opioid Use Disorder

Twelve-month and prior-to-past 12-months NMPOU information was aggregated into a lifetime measure. *Nonmedical prescription opioid use* 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.” The definition differs

in the NSDUH: "use without a prescription or only for the experience or feeling it caused."<sup>23</sup>

Lifetime *DSM-5* NMPOUD diagnoses required  $\geq 2$  of 11 criteria in the 12 months before interview or previously. Diagnoses prior to the past 12 months required clustering of  $\geq 2$  criteria within a single year. *DSM-IV* lifetime NMPOUD diagnoses required  $\geq 1$  of 4 abuse criteria or  $\geq 3$  of 7 dependence criteria clustered within a single year.

Symptom items (32) assessing *DSM-IV* 12-month NMPOUD in the 2001–2002 NESARC and NESARC-III were virtually identical. However, 3 items were slightly reworded, and an additional abuse item appeared in the NESARC and NESARC-III. Comparisons between *DSM-IV* diagnoses with and without the additional questions yielded identical prevalences (NESARC, 0.35% vs 0.35%; NESARC-III, 0.78% vs 0.78%), with near perfect concordance ( $\kappa = 1.00$  and 0.99), suggesting that trivial differences between *DSM-IV* NMPOUD operationalizations did not yield the large differences reported below.

Test-retest reliability of NMPOU and frequency of NMPOU were substantial ( $\kappa = 0.66, 0.66$ ) in a large general population sample.<sup>37</sup> Reliability of *DSM-5* NMPOUD categorical diagnoses ( $\kappa = 0.40, 0.47$ ) and dimensional criteria scales (intraclass correlation coefficient [ICC] = 0.71, 0.73) were moderate to substantial in a large general population sample.<sup>38</sup> Procedural validity of *DSM-5* NMPOUD was assessed through blind clinical reappraisal using the clinician-administered, semistructured Psychiatric Research Interview for Substance Use and Mental Disorders, *DSM-5* version (PRISM-5).<sup>39</sup> Moderate concordances between AUDADIS-5 and PRISM-5 NMPOUD diagnoses ( $\kappa = 0.40, 0.49$ ) and substantial concordances for their dimensional counterparts (ICC = 0.68, 0.79) were observed in a large general population sample.<sup>40</sup>

Test-retest reliability of *DSM-IV* NMPOUD diagnoses was moderate in clinical and general population samples.<sup>37,41,42</sup> Convergent, discriminant, and construct validities of AUDADIS-IV NMPOUD were moderate to substantial,<sup>43–46</sup> including in the World Health Organization/National Institutes of Health Study on Reliability and Validity ( $\kappa = 0.62$ ).<sup>47</sup>

### Other Psychopathology

*DSM-5* alcohol use disorder, nicotine use disorder, and other drug use disorder diagnoses (sedative/tranquilizer, cannabis, stimulant, cocaine, club drug, opioid, heroin, hallucinogen, and solvent/inhalant) were derived similarly

**Table 1. Prevalence and Odds Ratios (ORs) of 12-Month and Lifetime Nonmedical Prescription Opioid Use by Sociodemographic Characteristics<sup>a</sup>**

Sociodemographic Characteristic	12-Month (n = 1,579)		Lifetime (n = 4,090)	
	Prevalence, % (SE)	OR (95% CI) <sup>b</sup>	Prevalence, % (SE)	OR (95% CI) <sup>b</sup>
Total	4.10 (0.16)	...	11.29 (0.36)	...
Sex				
Male	4.38 (0.19)	<b>1.17</b> (1.04–1.32)	12.96 (0.40)	<b>1.42</b> (1.30–1.55)
Female	3.85 (0.20)	1.00 (reference)	9.75 (0.43)	1.00 (reference)
Race-ethnicity				
White	4.27 (0.19)	1.00 (reference)	12.79 (0.45)	1.00 (reference)
Black	5.18 (0.50)	0.93 (0.74–1.18)	9.85 (0.82)	0.59 (0.49–0.71)
Native American	5.88 (1.21) <sup>c</sup>	1.09 (0.70–1.71)	14.07 (2.00) <sup>c</sup>	0.91 (0.65–1.26)
Asian/Pacific Islander	1.55 (0.30)	<b>0.31</b> (0.21–0.47)	4.52 (0.56)	<b>0.27</b> (0.21–0.35)
Hispanic	3.32 (0.26)	<b>0.55</b> (0.44–0.68)	8.09 (0.47)	<b>0.44</b> (0.38–0.51)
Age, y				
18–29	5.67 (0.33)	<b>2.87</b> (2.21–3.72)	14.78 (0.58)	<b>3.89</b> (3.20–4.73)
30–44	4.41 (0.28)	<b>2.64</b> (2.01–3.46)	12.56 (0.53)	<b>3.56</b> (2.90–4.36)
45–64	3.87 (0.24)	<b>2.11</b> (1.63–2.74)	11.36 (0.46)	<b>2.87</b> (2.37–3.48)
$\geq 65$	2.18 (0.25)	1.00 (reference)	5.01 (0.45)	1.00 (reference)
Marital status				
Married/cohabiting	3.28 (0.20)	1.00 (reference)	9.73 (0.44)	1.00 (reference)
Widowed/separated/divorced	4.73 (0.27)	<b>1.33</b> (1.12–1.58)	12.54 (0.49)	<b>1.40</b> (1.24–1.59)
Never married	5.66 (0.33)	1.15 (0.96–1.38)	14.23 (0.51)	1.09 (0.97–1.23)
Education				
Less than high school	4.76 (0.39)	<b>1.24</b> (1.03–1.49)	10.58 (0.68)	1.00 (0.87–1.15)
High school	5.04 (0.26)	<b>1.30</b> (1.13–1.49)	12.19 (0.45)	1.07 (0.97–1.17)
Some college or higher	3.57 (0.18)	1.00 (reference)	11.07 (0.41)	1.00 (reference)
Family income				
0–\$19,999	6.55 (0.32)	<b>2.15</b> (1.76–2.63)	14.51 (0.56)	<b>1.81</b> (1.56–2.09)
\$20,000–\$34,999	4.10 (0.30)	<b>1.40</b> (1.11–1.77)	11.76 (0.52)	<b>1.46</b> (1.25–1.69)
\$35,000–\$69,999	3.58 (0.26)	<b>1.23</b> (1.01–1.50)	10.75 (0.52)	<b>1.24</b> (1.10–1.39)
$\geq \$70,000$	2.77 (0.21)	1.00 (reference)	9.12 (0.51)	1.00 (reference)
Urbanicity				
Urban	4.15 (0.19)	1.10 (0.85–1.43)	11.40 (0.42)	1.14 (0.96–1.35)
Rural	3.94 (0.44)	1.00 (reference)	10.91 (0.74)	1.00 (reference)
Region				
Northeast	3.26 (0.31)	<b>0.68</b> (0.53–0.88)	10.40 (0.73)	<b>0.78</b> (0.64–0.96)
Midwest	4.50 (0.45)	0.87 (0.67–1.14)	11.91 (1.25)	0.82 (0.63–1.08)
South	4.09 (0.23)	<b>0.78</b> (0.63–0.97)	10.85 (0.43)	<b>0.79</b> (0.68–0.92)
West	4.42 (0.34)	1.00 (reference)	12.14 (0.51)	1.00 (reference)

<sup>a</sup>Controlling for all other sociodemographic characteristics.

<sup>b</sup>Significant ( $P < .05$ ) ORs appear in bold font.

<sup>c</sup>Low precision.

Abbreviation: SE = standard error.

to NMPOUD. Sedative/tranquilizer and stimulant use disorders were aggregated to yield other nonmedical prescription drug use disorder diagnoses, with the remaining drug use disorders aggregated to yield diagnoses of any other drug use disorder. Test-retest reliabilities were moderate to substantial for alcohol use disorder ( $\kappa = 0.60, 0.62$ ), nicotine use disorder ( $\kappa = 0.50, 0.87$ ), and all other drug use disorders ( $\kappa = 0.41–0.54$ ) and were higher for their dimensional counterparts (ICCs = 0.45–0.85).<sup>38</sup> AUDADIS-5 and PRISM-5 concordance on alcohol use disorder, nicotine use disorder, and other drug use disorder diagnoses and dimensional scales was moderate to substantial ( $\kappa = 0.35–0.72$ ; ICCs = 0.38–0.92).<sup>40</sup>

Mood disorders assessed in the NESARC-III included 12-month and lifetime persistent depression, major depressive disorder, and bipolar I and 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 personality disorders included antisocial, borderline, and

**It is illegal to post this copyrighted PDF on any website.**

schizotypal. Psychometric properties of these psychiatric disorders are described in detail elsewhere.<sup>48</sup>

### Statistical Analysis

Weighted means, frequencies, and cross-tabulations were computed for 12-month and lifetime NMPOU and DSM-5 NMPOUD. Adjusted odds ratios (ORs) derived from multiple logistic regression indicated associations between NMPOU and NMPOUD and each sociodemographic characteristic controlling for all others. Logistic regressions of psychiatric comorbidity of NMPOU and NMPOUD controlled for sociodemographic characteristics and other substance use and psychiatric disorders. Anorexia nervosa, bulimia nervosa, and binge-eating disorder were too rare to assess comorbid associations with NMPOU and NMPOUD but were used as covariates in comorbidity analyses. Opioid-specific treatment seeking among individuals with NMPOU and NMPOUD was assessed across treatment modality. All analyses utilized SUDAAN<sup>49</sup> software that accounts for the NESARC-III's complex design.

## RESULTS

### Nonmedical Prescription Opioid Use

Prevalences of 12-month and lifetime NMPOU were 4.1% and 11.3% (Table 1), considerably higher than those in the 2001–2002 NESARC<sup>22</sup> (1.8% and 4.7%). Twelve-month rates were greater among men, the 3 youngest age groups, and those with annual incomes <\$70,000, ≤high school education, and those previously married. Prevalences were lower among Asian/Pacific Islanders and Hispanics and among those residing in the Northeast and South. Lifetime prevalence showed similar distributions.

### Nonmedical Prescription Opioid Use Disorder

Twelve-month and lifetime rates of DSM-5 NMPOUD were 0.9% and 2.1% (Table 2), with similar rates for DSM-IV (0.8% and 2.9%). Asians/Pacific Islanders and Hispanics had lower rates of 12-month and lifetime NMPOUD, and blacks had lower rates of lifetime NMPOUD than whites. Although rates were greatest among Native Americans (1.4% and 3.7%), low precision precluded reliable statistical comparisons. For both time frames, NMPOUD prevalences were greater among respondents <65 years old and among those with ≤high school education, those with lower incomes, and the previously married (for lifetime NMPOUD).

**Table 2. Prevalence and Odds Ratios (ORs) of 12-Month and Lifetime DSM-5 Nonmedical Prescription Opioid Use Disorder by Sociodemographic Characteristics<sup>a</sup>**

Sociodemographic Characteristic	12-Month (n=330)		Lifetime (n=688)	
	Prevalence, % (SE)	OR (95% CI) <sup>b</sup>	Prevalence, % (SE)	OR (95% CI) <sup>b</sup>
Total	0.89 (0.05)	...	2.05 (0.09)	...
Sex				
Male	0.92 (0.08)	1.12 (0.85–1.48)	2.19 (0.13)	1.17 (0.98–1.40)
Female	0.86 (0.08)	1.00 (reference)	1.93 (0.12)	1.00 (reference)
Race-ethnicity				
White	0.96 (0.07)	1.00 (reference)	2.42 (0.13)	1.00 (reference)
Black	1.04 (0.14)	0.73 (0.52–1.02)	1.55 (0.20)	<b>0.44</b> (0.32–0.59)
Native American	1.42 (0.58) <sup>c</sup>	1.01 (0.43–2.39)	3.67 (0.93) <sup>c</sup>	<b>1.08</b> (0.64–1.81)
Asian/Pacific Islander	0.16 (0.09)	<b>0.15</b> (0.05–0.52)	0.42 (0.16)	<b>0.15</b> (0.07–0.33)
Hispanic	0.70 (0.11)	<b>0.43</b> (0.29–0.64)	1.26 (0.17)	<b>0.30</b> (0.22–0.42)
Age, y				
18–29	1.16 (0.14)	<b>4.17</b> (2.23–7.80)	2.92 (0.22)	<b>8.30</b> (5.14–13.43)
30–44	0.94 (0.13)	<b>3.93</b> (2.04–7.56)	2.47 (0.19)	<b>7.75</b> (5.01–11.99)
45–64	0.94 (0.10)	<b>3.32</b> (1.92–5.73)	1.98 (0.17)	<b>5.21</b> (3.39–8.03)
≥65	0.39 (0.10)	1.00 (reference)	0.53 (0.11)	1.00 (reference)
Marital status				
Married/cohabiting	0.71 (0.07)	1.00 (reference)	1.67 (0.10)	1.00 (reference)
Widowed/separated/divorced	1.23 (0.13)	1.32 (0.95–1.83)	2.59 (0.25)	<b>1.42</b> (1.12–1.81)
Never married	1.05 (0.13)	0.81 (0.59–1.11)	2.55 (0.21)	0.89 (0.67–1.17)
Education				
Less than high school	1.49 (0.20)	<b>1.96</b> (1.33–2.90)	2.70 (0.29)	<b>1.62</b> (1.21–2.18)
High school	1.21 (0.13)	<b>1.62</b> (1.23–2.14)	2.60 (0.20)	<b>1.42</b> (1.13–1.79)
Some college or higher	0.63 (0.05)	1.00 (reference)	1.68 (0.10)	1.00 (reference)
Family income				
0–\$19,999	1.84 (0.18)	<b>4.26</b> (2.35–7.70)	3.43 (0.24)	<b>3.24</b> (2.23–4.71)
\$20,000–\$34,999	0.90 (0.13)	<b>2.22</b> (1.21–4.08)	2.25 (0.26)	<b>2.21</b> (1.52–3.22)
\$35,000–\$69,999	0.65 (0.11)	1.59 (0.92–2.73)	1.86 (0.15)	<b>1.73</b> (1.24–2.42)
≥\$70,000	0.39 (0.08)	1.00 (reference)	1.08 (0.13)	1.00 (reference)
Urbanicity				
Urban	0.89 (0.06)	1.21 (0.85–1.71)	2.02 (0.10)	1.12 (0.85–1.47)
Rural	0.88 (0.13)	1.00 (reference)	2.17 (0.27)	1.00 (reference)
Region				
Northeast	0.85 (0.11)	0.95 (0.62–1.45)	2.11 (0.20)	0.98 (0.75–1.29)
Midwest	0.93 (0.10)	0.89 (0.60–1.32)	1.98 (0.17)	0.77 (0.59–1.00)
South	0.90 (0.08)	0.82 (0.56–1.20)	2.05 (0.18)	0.83 (0.63–1.08)
West	0.87 (0.13)	1.00 (reference)	2.07 (0.19)	1.00 (reference)

<sup>a</sup>Controlling for all other sociodemographic characteristics.

<sup>b</sup>Significant ( $P < .05$ ) odds ratios appear in bold font.

<sup>c</sup>Low precision.

Abbreviation: SE = standard error.

### Comorbidity

Nonmedical prescription opioid use and DSM-5 NMPOUD were strongly related to other nonmedical prescription drug use disorders, other drug use disorders, alcohol use disorder, nicotine use disorder, PTSD, and schizotypal, borderline, and antisocial personality disorders, regardless of time frame (Table 3). Twelve-month and lifetime NMPOU were associated with persistent depression and lifetime NMPOUD was associated with bipolar I disorder for each time period.

### Treatment/Help Seeking

Overall, only 5.5% and 7.9% of individuals with 12-month and lifetime NMPOU were treated; corresponding rates for NMPOUD were 17.7% and 28.9% (Table 4). Among those with 12-month NMPOU, 3.2% received treatment from physicians/health care practitioners, 2.1% from 12-step programs, and 0.9%–1.3% from outpatient clinics, emergency departments, detoxification programs, and

It is illegal to post this copyrighted PDF on any website.

**Table 3. Odds Ratios (ORs) of 12-Month and Lifetime Nonmedical Prescription Opioid Use/DSM-5 Nonmedical Prescription Opioid Use Disorder and Psychiatric Disorders<sup>a</sup>**

Comorbid Disorder	Opioid Use		Opioid Use Disorder	
	12-Month, OR (95% CI)	Lifetime, OR (95% CI)	12-Month, OR (95% CI)	Lifetime, OR (95% CI)
Any substance use disorder	<b>2.95<sup>b</sup></b> (2.54–3.44)	<b>3.07</b> (2.67–3.53)	<b>4.28</b> (3.05–6.00)	<b>7.65</b> (5.48–10.67)
Alcohol use disorder	<b>1.77</b> (1.49–2.10)	<b>1.73</b> (1.55–1.93)	<b>1.50</b> (1.08–2.10)	<b>1.93</b> (1.56–2.40)
Any drug use disorder	<b>3.68</b> (2.97–4.57)	<b>3.49</b> (3.10–3.93)	<b>6.92</b> (5.11–9.37)	<b>5.12</b> (3.89–6.74)
Any other nonmedical prescription drug use disorder	<b>10.69</b> (7.33–15.58)	<b>6.80</b> (5.61–8.25)	<b>17.67</b> (10.69–29.21)	<b>11.73</b> (8.83–15.58)
Any drug use disorder except nonmedical prescription drug use disorders	<b>2.79</b> (2.21–3.52)	<b>2.99</b> (2.63–3.40)	<b>4.27</b> (2.95–6.17)	<b>3.94</b> (3.11–5.00)
Nicotine use disorder	<b>1.84</b> (1.58–2.13)	<b>1.80</b> (1.63–1.97)	<b>2.25</b> (1.67–3.05)	<b>1.89</b> (1.47–2.42)
Any mood disorder	<b>1.59</b> (1.36–1.87)	<b>1.20</b> (1.07–1.36)	<b>2.47</b> (1.81–3.36)	<b>1.66</b> (1.29–2.12)
Major depressive disorder	<b>1.26</b> (1.05–1.52)	1.09 (0.96–1.23)	1.24 (0.78–1.98)	1.01 (0.78–1.32)
Persistent depression	<b>1.43</b> (1.06–1.92)	<b>1.28</b> (1.10–1.49)	1.74 (1.00–3.03)	1.21 (0.88–1.64)
Bipolar I disorder	1.27 (0.92–1.76)	1.09 (0.89–1.34)	<b>1.73</b> (1.09–2.74)	<b>1.50</b> (1.07–2.12)
Bipolar II disorder	1.19 (0.57–2.49)	1.19 (0.70–2.04)	1.65 (0.51–5.32)	1.12 (0.44–2.88)
Any anxiety disorder	1.14 (0.94–1.39)	1.05 (0.93–1.20)	1.48 (0.98–2.24)	<b>1.32</b> (1.04–1.66)
Panic disorder	1.08 (0.80–1.46)	1.12 (0.94–1.34)	1.41 (0.83–2.39)	1.32 (0.97–1.80)
Agoraphobia	0.91 (0.64–1.31)	1.20 (0.92–1.56)	1.09 (0.61–1.95)	1.26 (0.79–2.00)
Social phobia	0.95 (0.70–1.28)	1.14 (0.93–1.39)	1.01 (0.63–1.61)	1.02 (0.74–1.41)
Specific phobia	0.91 (0.68–1.21)	0.91 (0.76–1.09)	1.07 (0.67–1.71)	1.00 (0.73–1.38)
Generalized anxiety disorder	1.10 (0.86–1.40)	0.95 (0.79–1.13)	0.92 (0.56–1.51)	0.99 (0.74–1.32)
Posttraumatic stress disorder	<b>1.41</b> (1.13–1.75)	<b>1.30</b> (1.11–1.51)	<b>1.57</b> (1.06–2.33)	<b>1.65</b> (1.29–2.12)
Any personality disorder	<b>1.70</b> (1.45–1.99)	<b>1.97</b> (1.75–2.22)	<b>2.04</b> (1.42–2.94)	<b>2.54</b> (2.06–3.12)
Schizotypal	<b>1.42</b> (1.14–1.77)	<b>1.36</b> (1.13–1.64)	1.44 (0.94–2.22)	<b>1.35</b> (1.01–1.80)
Borderline	<b>1.39</b> (1.12–1.72)	<b>1.47</b> (1.25–1.72)	<b>1.78</b> (1.16–2.75)	<b>1.68</b> (1.21–2.32)
Antisocial	<b>1.59</b> (1.30–1.96)	<b>2.13</b> (1.81–2.51)	<b>1.60</b> (1.16–2.22)	<b>2.39</b> (1.84–3.10)

<sup>a</sup>Controlling for sociodemographic characteristics and other psychiatric disorders.

<sup>b</sup>Significant ( $P < .05$ ) ORs appear in bold font.

**Table 4. Treatment/Help-Seeking Settings Among Individuals With 12-Month and Lifetime Nonmedical Prescription Opioid Use and Nonmedical Prescription Opioid Use Disorder**

Treatment/Help-Seeking Setting	Opioid Use		Opioid Use Disorder	
	12-Month, % (SE)	Lifetime, % (SE)	12-Month, % (SE)	Lifetime, % (SE)
12-Step program (eg, AA)	2.13 (0.50)	4.66 (0.48)	8.46 (2.03)	18.31 (2.01)
Family/social services	0.36 (0.17)	1.29 (0.25)	1.66 (0.76)	5.08 (0.95)
Detoxification	1.16 (0.32)	2.68 (0.33)	4.91 (1.33)	10.30 (1.35)
Other inpatient facility	0.71 (0.25)	1.67 (0.28)	3.29 (1.13)	6.15 (1.14)
Outpatient clinic	0.91 (0.26)	2.38 (0.27)	3.39 (1.07)	10.93 (1.21)
Rehabilitation program	1.30 (0.40)	3.30 (0.41)	4.03 (1.43)	12.4 (1.74)
Methadone maintenance	0.51 (0.20)	1.05 (0.17)	1.99 (0.80)	5.05 (0.82)
Emergency department	1.04 (0.32)	1.70 (0.24)	4.80 (1.46)	7.68 (1.03)
Halfway house	0.04 (0.04)	0.68 (0.17)	0.18 (0.18)	2.10 (0.59)
Crisis center	0.32 (0.16)	0.36 (0.09)	1.03 (0.60)	1.34 (0.39)
Employee assistance program	...	0.21 (0.09)	...	0.63 (0.37)
Clergy	0.65 (0.39)	0.72 (0.18)	0.81 (0.52)	2.81 (0.82)
Physician/other health care professional	3.24 (0.66)	3.50 (0.34)	10.31 (2.28)	13.87 (1.76)
Other	0.47 (0.21)	0.58 (0.15)	2.07 (0.94)	2.33 (0.67)
Any treatment or help-seeking settings	5.46 (0.80)	7.86 (0.50)	17.69 (2.80)	28.92 (2.07)

Abbreviations: AA = Alcoholics Anonymous, SE = standard error.

Symbol: ... = no observation.

rehabilitation programs; other modalities were utilized less frequently. Treatment among individuals with lifetime NMPOU followed a similar distribution except that 12-step participation (4.7%) was utilized more frequently than health care practitioners (3.5%).

Among individuals with 12-month NMPOUD, 10.3% received treatment from physicians/health care practitioners, 8.5% from self-help programs, and 3.4%–4.9% from outpatient clinics, rehabilitation programs, emergency departments, and detoxification programs, with utilization of other modalities less frequent. Similar patterns were

observed for lifetime NMPOUD except that a greater percentage of respondents sought treatment from 12-step programs (18.3%) than from physicians/health care practitioners (13.9%).

**DISCUSSION**

In 2012–2013, prevalences of 12-month and lifetime NMPOU were 4.1% and 11.3%, representing about 9.7 million and 26.6 million US adults. Consistent with substantial increases in opioid prescriptions<sup>2,3</sup> and NMPOU-associated morbidity and mortality during the past decade,<sup>1–6</sup> these rates were considerably greater than those reported in the 2001–2002 NESARC (1.8%, 4.7%).<sup>22</sup> The NSDUH rates of 12-month and lifetime NMPOU in 2013 were similar (4.2%, 14.2%).<sup>23</sup>

Twelve-month and lifetime rates of DSM-5 NMPOUD were 0.9% and 2.1%, representing about 2.1 million and 4.8 million US adults. In NESARC-III, corresponding prevalences of DSM-IV NMPOUD were similar, 0.8% and 2.9%, but greater than corresponding rates reported in the 2001–2002 NESARC (0.4%, 1.4%).<sup>22</sup> The 12-month prevalence of DSM-IV NMPOUD in the 2013 NSDUH was 0.6%.<sup>23</sup>

Dramatic increases in NMPOU (161%) and NMPOUD (125%) observed in this study over the last decade may reflect, in part, increases in opioid prescribing and dosage; increased

It is illegal to post this copyrighted PDF on any website.

**It is illegal to post this copyrighted PDF on any website.**

advocacy for opioid treatment of chronic noncancer pain; availability of long-acting formulations; lessened perceived risk or greater social acceptability of substances that can be obtained by legitimate prescription; drug diversion; aggressive marketing by pharmaceutical companies; disregard for the lack of long-term effectiveness; and lack of understanding of opioids' addiction potential.<sup>50-54</sup>

Consistent with most prior studies,<sup>10-22,26,55-57</sup> men had greater rates of NMPOU. Although reasons for this sex differential are unclear, women more frequently report pain as motivation for first opioid use, while euphoria is the major motivation for men.<sup>55</sup> Women also more often use opioids via legitimate prescriptions and intended route of administration, whereas men more often report obtaining opioids from illicit markets and using unintended routes of administration.<sup>58,59</sup>

The absence of sex differences in NMPOUD is inconsistent with higher prevalences among men in earlier studies,<sup>19,21,22</sup> including the NSDUH,<sup>23</sup> and across many other substance use disorders.<sup>60-64</sup> This finding may reflect that women are increasingly more likely to be prescribed opioids,<sup>10</sup> a shift related in part to the greater prevalence of comorbid pain and affective disorders among women.<sup>65,66</sup> Nonetheless, the narrowing gender gap in NMPOUD is important for screening, prevention, and treatment. Of note, most risk stratification and screening tools identify male sex as a NMPOUD risk factor.<sup>54</sup>

Much debate surrounding the opioid epidemic has focused on the dependence liability of opioids. Recent studies on dependence risk among pain patients have yielded estimates of 0.00%–45.0%.<sup>67-72</sup> These studies generally failed to define dependence, and most excluded patients with histories of substance use disorders or psychiatric disorders. In this study, 18.2% of individuals with NMPOU were classified with NMPOUD. Considering the key role of dependence liability in the opioid debate, uniform definitions and validated assessments based on current scientific and clinical understanding are essential to establish liability parameters. Within this context, the *DSM-5* definition of opioid use disorder explicitly excludes tolerance and withdrawal as criteria if the individual is “taking opioids solely under appropriate medical supervision.”<sup>31</sup> This exclusion does not apply to individuals with NMPOUD.

Nonmedical prescription opioid use and NMPOUD prevalences decreased with age. Whether the declining rates observed here and previously<sup>22,23,73-75</sup> reflect cohort, age, or period effects<sup>76</sup>; differential mortality; or recall bias merits further investigation. Although rates of NMPOU and NMPOUD were substantially lower among individuals  $\geq 65$  years old, rates among these individuals may rise with increasing life expectancy and as the proportion of the US population aged 65 to 74 years achieves its projected growth rate of 74% by 2020.<sup>77</sup> Even if rates among the elderly remain steady, the projected increase in population size portends substantial increases in the number at risk in this cohort, in which illicit drug use was also common.<sup>74,78</sup>

Consistent with most research,<sup>19-23,79-81</sup> rates of NMPOU and NMPOUD were generally greater among whites and individuals with lower incomes, lower education, and widowed/separated/divorced marital status. Prevalences of NMPOUD were lower among blacks, and Native Americans had the greatest rates of NMPOU and NMPOUD, but low precision precluded reliable significance testing. In contrast to the results of a recent state-level study<sup>82</sup> in which opioid prescription rates were greatest in the South and Northeast followed by the West, this study showed that rates of NMPOU were significantly lower in the South and Northeast relative to West. Further, no regional differences were found for NMPOUD. These regional discrepancies suggest that opioid prescription rates may be imperfectly related to the rates of NMPOU and NMPOUD. Understanding the mechanism of underlying sociodemographic risk and protective factors 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 subgroups of the population at risk of NMPOU and NMPOUD, as well as potential barriers to their treatment.

Consistent with earlier findings,<sup>17,22,26-30,83-86</sup> this study revealed strong associations between NMPOU and NMPOUD and other nonmedical prescription drug use disorders (sedative/tranquilizer, stimulant) and smaller, but significant, associations with other psychopathology. These findings underscore the need to diagnose and treat comorbidities among individuals with NMPOU and NMPOUD. This is especially critical because individuals presenting with substance use disorders 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<sup>72,87-96</sup> than those without these disorders. Accurate diagnosis and care of NMPOU and NMPOUD complicated by psychiatric comorbidity and pain will be a substantial challenge in the future.

Similar to the results of prior research,<sup>22</sup> past-year and lifetime treatment rates of NMPOU and NMPOUD were low (5.5% and 17.7%). The reasons for these particularly low treatment rates are not known but may reflect the belief that prescription drugs are less dangerous than illegal drugs. Individuals may also be reluctant to discuss potential prescription drug problems with their physicians that may endanger future prescriptions.<sup>97</sup> Alternatively, individuals prescribed opioids may be ambivalent about giving up the rewarding effects of the substance despite negative consequences associated with their use.<sup>98</sup> Stigmatization, shown to be a critical barrier to substance abuse treatment,<sup>99</sup> may also contribute to the low treatment rates found in this study. Taken together, these results highlight the need for physicians to periodically and systematically screen for NMPOU and NMPOUD and to educate patients and their families about the risks associated with them.

The present results contrast with NSDUH findings of stable rates of 12-month NMPOU (4.2%–4.9%) and NMPOUD (0.6%–0.8%) between 2002 and 2013.<sup>100</sup> Differing

**It is illegal to post this copyrighted PDF on any website.**

definitions of NMPOU could explain these discrepancies, since only respondents answering NMPOU questions affirmatively are asked NMPOUD items. The AUDADIS versions used in the NESARC-III and 2001–2002 NESARC include many more items than the NSDUH instruments, and their test-retest reliability and validity are extensively documented.<sup>37,38,40–48</sup> Better sensitivity through more extensive probing of NMPOUD criteria has been identified as another reason for discrepancies in rates between these surveys.<sup>101</sup>

Strengths of NESARC-III included its large sample; reliable and valid measures of NMPOU, NMPOUD, and other psychopathology; and rigorous methodology. The NESARC-III is also unique in providing current, comprehensive information on the epidemiology of NMPOU and DSM-5 NMPOUD in the United States from a single uniform source. Limitations include that not all psychiatric disorders were assessed, similar to other large US surveys. Because some population segments (homeless individuals, prisoners) were not covered, the prevalence of NMPOU and NMPOUD may have been underestimated. The NESARC-III was also

cross-sectional. Longitudinal surveys are needed to further investigate the stability of relationships found herein.

Nonmedical prescription opioid use and NMPOUD have increased considerably over the past decade, are associated with a broad array of risk factors and comorbidities, and largely go untreated in the United States. Valid assessment tools and algorithms are needed to stratify patients by risk based on current methodologically rigorous epidemiologic studies. This study demonstrated strong associations of NMPOU and NMPOUD with pain, other substance use disorders, and psychiatric disorders that may indicate the severe impact of pain on mental health or difficulties in translating comorbidity care into clinical practice. The critical treatment gap observed in this study highlights the need for research on evidence-based treatments for NMPOUD that may better match affected individuals' clinical characteristics.<sup>102–104</sup> As more information emerges on determinants, characteristics, and outcomes of NMPOU and NMPOUD, appropriate prevention and intervention must balance the complexity of these conditions with access to prescription opioids for all who need them.

**Submitted:** September 10, 2015; accepted January 4, 2016.

**Drug names:** methadone (Methadose and others).

**Disclosure of off-label usage:** The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside US Food and Drug Administration–approved labeling has been presented in this article.

**Financial disclosure:** Drs Saha, Kerridge, Goldstein, Chou, Zhang, Jung, Smith, Huang, Hasin, and Grant; Mr Pickering; and Ms Ruan have no personal affiliations or financial relationships with any commercial interest to disclose relative to the article.

**Funding/support:** The NESARC-III was sponsored by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), with supplemental support from the National Institute on Drug Abuse. Support is acknowledged from National Institute on Drug Abuse R01DA034244-01 and New York State Psychiatric Institute (Dr Hasin), National Institute on Drug Abuse F32DA0364431 (Dr Kerridge), and from the intramural program, NIAAA, National Institutes of Health.

**Role of the sponsor:** Sponsors and funders of the NESARC-III had no role in the design and conduct of the study; collection, management analysis, and interrelation of the data; and preparation, review, and approval of the manuscript.

**Disclaimer:** The views and opinions expressed in this report are those of the authors and should not be construed to represent the views of any of the sponsoring organizations or agencies or the US government.

**Additional information:** More information about the NESARC-III data set from the National Institute on Alcohol Abuse and Alcoholism may be obtained at <http://www.niaaa.nih.gov/research/nescarc-iii/nescarc-iii-data-access>.

## REFERENCES

- Institute of Medicine Report from the Committee on Advancing Pain Research, Care, and Education. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care,*
- Dart RC, Surratt HL, Cicero TJ, et al. Trends in opioid analgesic abuse and mortality in the United States. *N Engl J Med.* 2015;372(3):241–248.
- National Institute on Drug Abuse. *America's Addiction to Opioids: Heroin and Prescription Drug Abuse.* Rockville, MD: National Institute on Drug Abuse; 2015.
- Warner M, Hedegaard H, Chen L-H. *Trends in Drug-poisoning Deaths Involving Opioid Analgesics and Heroin: United States.* Atlanta, GA: Centers for Disease Control; 2012.
- 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 Visits.* 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.
- 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(1–2):95–100.
- Pollini RA, Banta-Green CJ, Cuevas-Mota J, et al. Problematic use of prescription-type opioids prior to heroin use among young heroin injectors. *Subst Abuse Rehabil.* 2011;2(1):173–180.
- 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.
- Miller M, Stürmer T, Azrael D, et al. Opioid analgesics and the risk of fractures in older adults with arthritis. *J Am Geriatr Soc.* 2011;59(3):430–438.
- Rolita L, Spegman A, Tang X, et al. Greater number of narcotic analgesic prescriptions for osteoarthritis is associated with falls and fractures in elderly adults. *J Am Geriatr Soc.* 2013;61(3):335–340.
- Creanga AA, Sabel JC, Ko JY, et al. Maternal drug use and its effect on neonates: a population-based study in Washington State. *Obstet Gynecol.* 2012;119(5):924–933.
- US Department of Health and Human Services. *Addressing Prescription Drug Abuse in the United States: Current Activities and Future Opportunities.* Washington, DC: US Department of Health and Human Services; 2011.
- Birnbaum HG, White AG, Schiller M, et al. Societal costs of prescription opioid abuse, dependence, and misuse in the United States. *Pain Med.* 2011;12(4):657–667.
- 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.
- Hansen RN, Oster G, Edelsberg J, et al. Economic costs of nonmedical use of prescription opioids. *Clin J Pain.* 2011;27(3):194–202.
- Amari E, Rehm J, Goldner E, et al. Nonmedical prescription opioid use and mental health and pain comorbidities: a narrative review. *Can J Psychiatry.* 2011;56(8):495–502.
- Beauchamp GA, Winstanley EL, Ryan SA, et al. Moving beyond misuse and diversion: the urgent need to consider the role of iatrogenic addiction in the current opioid epidemic. *Am J Public Health.* 2014;104(11):2023–2029.
- McHugh RK, Nielsen S, Weiss RD. Prescription drug abuse: from epidemiology to public policy. *J Subst Abuse Treat.* 2015;48(1):1–7.
- Parsells Kelly J, Cook SF, Kaufman DW, et al. Prevalence and characteristics of opioid use in the US adult population. *Pain.* 2008;138(3):507–513.
- Tetrault JM, Desai RA, Becker WC, et al. Gender and non-medical use of prescription opioids: results from a national US survey. *Addiction.* 2008;103(2):258–268.
- Huang B, Dawson DA, Stinson FS, et al. 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(7):1062–1073.

It is illegal to post this copyrighted PDF on any website.

23. 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.
24. Grant BF, Kaplan K, Shepard J, et al. *Source and Accuracy Statement of Wave 1 of the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions*. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism; 2001.
25. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fourth Edition. Washington, DC: American Psychiatric Association; 1994.
26. Becker WC, Sullivan LE, Tetrault JM, et al. Non-medical use, abuse and dependence on prescription opioids among US adults: psychiatric, medical and substance use correlates. *Drug Alcohol Depend*. 2008;94(1–3):38–47.
27. Compton WM, Conway KP, Stinson FS, et al. 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(6):677–685.
28. Katz C, El-Gabalawy R, Keyes KM, et al. Risk factors for incident nonmedical prescription opioid use and abuse and dependence: results from a longitudinal nationally representative sample. *Drug Alcohol Depend*. 2013;132(1–2):107–113.
29. Martins SS, Fenton MC, Keyes KM, et al. Mood and anxiety disorders and their association with non-medical prescription opioid use and prescription opioid-use disorder: longitudinal evidence from the National Epidemiologic Study on Alcohol and Related Conditions. *Psychol Med*. 2012;42(6):1261–1272.
30. Martins SS, Keyes KM, Storr CL, et al. 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(1–2):16–24.
31. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fifth Edition. Washington, DC: American Psychiatric Association; 2013.
32. Hasin DS, O'Brien CP, Auriacombe M, et al. DSM-5 criteria for substance use disorders: recommendations and rationale. *Am J Psychiatry*. 2013;170(8):834–851.
33. Grant BF, Amsbary M, Chu A, et al. *Sources and Accuracy Statement: National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III)*. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism; 2014.
34. Centers for Disease Control and Prevention. *Unweighted Response Rates for the NHANES 2011–2012*. Atlanta, GA: Centers for Disease Control and Prevention; 2013.
35. Bureau of the Census. *American Community Survey, 2012*. Suitland, MD: Bureau of the Census; 2013.
36. Grant BF, Goldstein RB, Chou SP, et al. *The Alcohol Use Disorder and Associated Disabilities Interview Schedule—Diagnostic and Statistical Manual of Mental Disorders Fifth Edition Version (AUDADIS-5)*. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism; 2011.
37. Grant BF, Harford TC, Dawson DA, et al. The Alcohol Use Disorder and Associated Disabilities Interview schedule (AUDADIS): reliability of alcohol and drug modules in a general population sample. *Drug Alcohol Depend*. 1995;39(1):37–44.
38. Grant BF, Goldstein RB, Smith SM, et al. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-5 (AUDADIS-5): reliability of substance use and psychiatric disorder modules in a general population sample. *Drug Alcohol Depend*. 2015;148(1):27–33.
39. Hasin DS, Aivadyan C, Greenstein E, et al. *Psychiatric Research Interview for Substance Use and Mental Disorders, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (PRISM-5) Version*. New York, NY: Columbia University, Department of Psychiatry; 2011.
40. Hasin DS, Greenstein E, Aivadyan C, et al. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-5 (AUDADIS-5): procedural validity of substance use disorders modules through clinical re-appraisal in a general population sample. *Drug Alcohol Depend*. 2015;148:40–46.
41. Chatterji S, Saunders JB, Vrasti R, et al. Reliability of the alcohol and drug modules of the Alcohol Use Disorder and Associated Disabilities Interview Schedule—Alcohol/Drug-Revised (AUDADIS-ADR): an international comparison. *Drug Alcohol Depend*. 1997;47(3):171–185.
42. Hasin D, Carpenter KM, McCloud S, et al. The Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS): reliability of alcohol and drug modules in a clinical sample. *Drug Alcohol Depend*. 1997;44(2–3):133–141.
43. Canino G, Bravo M, Ramirez R, et al. The Spanish Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS): reliability and concordance with clinical diagnoses in a Hispanic population. *J Stud Alcohol*. 1999;60(6):790–799.
44. Hasin DS, Muthuen B, Wisnicki KS, et al. Validity of the bi-axial dependence concept: a test in the US general population. *Addiction*. 1994;89(5):573–579.
45. Nelson CB, Rehm J, Ustün TB, et al. Factor structures for DSM-IV substance disorder criteria endorsed by alcohol, cannabis, cocaine and opiate users: results from the WHO reliability and validity study. *Addiction*. 1999;94(6):843–855.
46. Saha TD, Compton WM, Chou SP, et al. Analyses related to the development of DSM-5 criteria for substance use related disorders, 1: toward amphetamine, cocaine and prescription drug use disorder continua using Item Response Theory. *Drug Alcohol Depend*. 2012;122(1–2):38–46.
47. Cottler LB, Grant BF, Blaine J, et al. Concordance of DSM-IV alcohol and drug use disorder criteria and diagnoses as measured by AUDADIS-ADR, CIDI and SCAN. *Drug Alcohol Depend*. 1997;47(3):195–205.
48. Hasin DS, Shmulewitz D, Stohl M, et al. Procedural validity of the AUDADIS-5 depression, anxiety and post-traumatic stress disorder modules: substance abusers and others in the general population. *Drug Alcohol Depend*. 2015;152:246–256.
49. Research Triangle Institute. *SUDAAN Language Manual, Release 11.0*. Research Triangle Park, NC: The Institute; 2012.
50. Atluri S, Sudarshan G, Manchikanti L. Assessment of the trends in medical use and misuse of opioid analgesics from 2004 to 2011. *Pain Physician*. 2014;17(2):E119–E128.
51. Fleary SA, Heffer RW, McKeyer EL. Understanding nonprescription and prescription drug misuse in late adolescence/young adulthood. *J Addict*. 2013;2013:709207.
52. Manchikanti L, Fellows B, Ailani H, et al. Therapeutic use, abuse, and nonmedical use of opioids: a ten-year perspective. *Pain Physician*. 2010;13(5):401–435.
53. Manchikanti L, Singh A. Therapeutic opioids: a ten-year perspective on the complexities and complications of the escalating use, abuse, and nonmedical use of opioids. *Pain Physician*. 2008;11(suppl):S63–S88.
54. Sehgal N, Manchikanti L, Smith HS. Prescription opioid abuse in chronic pain: a review of opioid abuse predictors and strategies to curb opioid abuse. *Pain Physician*. 2012;15(suppl):ES67–ES92.
55. Back SE, Payne RL, Simpson AN, et al. Gender and prescription opioids: findings from the National Survey on Drug Use and Health. *Addict Behav*. 2010;35(11):1001–1007.
56. Roe CM, McNamara AM, Motheral BR. Gender- and age-related prescription drug use patterns. *Ann Pharmacother*. 2002;36(1):30–39.
57. Simoni-Wastila L. The use of abusable prescription drugs: the role of gender. *J Womens Health Gen Based Med*. 2000;9(3):289–297.
58. Cicero TJ, Lynskey M, Todorov A, et al. Co-morbid pain and psychopathology in males and females admitted to treatment for opioid analgesic abuse. *Pain*. 2008;139(1):127–135.
59. Back SE, Lawson KM, Singleton LM, et al. Characteristics and correlates of men and women with prescription opioid dependence. *Addict Behav*. 2011;36(8):829–834.
60. Compton WM, Thomas YF, Stinson FS, et al. 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(5):566–576.
61. Grant BF, Hasin DS, Chou SP, et al. Nicotine dependence and psychiatric disorders in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry*. 2004;61(11):1107–1115.
62. Hasin DS, Stinson FS, Ogburn E, et al. Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psychiatry*. 2007;64(7):830–842.
63. Stinson FS, Grant BF, Dawson DA, et al. 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(1):105–116.
64. Stinson FS, Ruan WJ, Pickering R, et al. Cannabis use disorders in the USA: prevalence, correlates and co-morbidity. *Psychol Med*. 2006;36(10):1447–1460.
65. Garcia-Cebrian A, Gandhi P, Demyttenaere K, et al. The association of depression and painful physical symptoms—a review of the European literature. *Eur Psychiatry*. 2006;21(6):379–388.
66. Rijavec N, Grubic VN. Depression and pain: often together but still a clinical challenge: a review. *Psychiatr Danub*. 2012;24(4):346–352.
67. Brown RL, Patterson JJ, Rounds LA, et al. Substance abuse among patients with chronic back pain. *J Fam Pract*. 1996;43(2):152–160.
68. Chelminski PR, Ives TJ, Felix KM, et al. A primary care, multi-disciplinary disease management program for opioid-treated patients with chronic non-cancer pain and a high burden of psychiatric comorbidity. *BMC Health Serv Res*. 2005;5(1):3.
69. Fishbain DA, Cole B, Lewis J, et al. What percentage of chronic nonmalignant pain patients exposed to chronic opioid analgesic therapy develop abuse/addiction and/or aberrant drug-related behaviors? a structured evidence-based review. *Pain Med*. 2008;9(4):444–459.
70. Martell BA, O'Connor PG, Kerns RD, et al. Systematic review: opioid treatment for

It is illegal to post this copyrighted PDF on any website.



- chronic back pain: prevalence, efficacy, and association with addiction. *Ann Intern Med.* 2007;146(2):116–127.
71. Minozzi S, Amato L, Davoli M. Development of dependence following treatment with opioid analgesics for pain relief: a systematic review. *Addiction.* 2013;108(4):688–698.
  72. Sullivan MD, Howe CQ. Opioid therapy for chronic pain in the United States: promises and perils. *Pain.* 2013;154(suppl 1):S94–S100.
  73. Thomas E, Peat G, Harris L, et al. The prevalence of pain and pain interference in a general population of older adults: cross-sectional findings from the North Staffordshire Osteoarthritis Project (NorStOP). *Pain.* 2004;110(1–2):361–368.
  74. West NA, Severtson SG, Green JL, et al. Trends in abuse and misuse of prescription opioids among older adults. *Drug Alcohol Depend.* 2015;149:117–121.
  75. Wu L-T, Blazer DG. Illicit and nonmedical drug use among older adults: a review. *J Aging Health.* 2011;23(3):481–504.
  76. Martins SS, Keyes KM, Storr CL, et al. 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(4):480–487.
  77. National Institute on Aging. *US Department of Commerce, Economics and Statistics Administration, United States Census Bureau. Aging in the United States—Past, Present, and Future.* Washington, DC: US Department of Commerce; 2012.
  78. Simoni-Wastila L, Yang HK. Psychoactive drug abuse in older adults. *Am J Geriatr Pharmacother.* 2006;4(4):380–394.
  79. Martins SS, Kim JH, Chen L-Y, et al. Nonmedical prescription drug use among US young adults by educational attainment. *Soc Psychiatry Psychiatr Epidemiol.* 2015;50(5):713–724.
  80. Wang KH, Becker WC, Fiellin DA. Prevalence and correlates for nonmedical use of prescription opioids among urban and rural residents. *Drug Alcohol Depend.* 2013;127(1–3):156–162.
  81. Wu L-T, Blazer DG, Swartz MS, et al; NIDA AAPI Workgroup. Illicit and nonmedical drug use among Asian Americans, Native Hawaiians/Pacific Islanders, and mixed-race individuals. *Drug Alcohol Depend.* 2013;133(2):360–367.
  82. Kuehn BM. CDC: major disparities in opioid prescribing among states: some states crack down on excess prescribing. *JAMA.* 2014;312(7):684–686.
  83. Fischer B, Lusted A, Roerecke M, et al. The prevalence of mental health and pain symptoms in general population samples reporting nonmedical use of prescription opioids: a systematic review and meta-analysis. *J Pain.* 2012;13(11):1029–1044.
  84. Boyd CJ, Teter CJ, West BT, et al. Non-medical use of prescription analgesics: a three-year national longitudinal study. *J Addict Dis.* 2009;28(3):232–242.
  85. Frankenburg FR, Fitzmaurice GM, Zanarini MC. The use of prescription opioid medication by patients with borderline personality disorder and axis II comparison subjects: a 10-year follow-up study. *J Clin Psychiatry.* 2014;75(4):357–361.
  86. Trageser SL, Jones RE, Robinson RJ, et al. Borderline personality disorder features and risk for prescription opioid use disorders. *J Pers Disord.* 2013;27(4):427–441.
  87. Braden JB, Sullivan MD, Ray GT, et al. Trends in long-term opioid therapy for noncancer pain among persons with a history of depression. *Gen Hosp Psychiatry.* 2009;31(6):564–570.
  88. Edlund MJ, Martin BC, Devries A, et al. 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):1–8.
  89. Eriksen J, Sjøgren P, Bruera E, et al. Critical issues on opioids in chronic non-cancer pain: an epidemiological study. *Pain.* 2006;125(1–2):172–179.
  90. France RD. Psychiatric aspects of pain. *Clin J Pain.* 1989;5(suppl 2):S35–S41, discussion S41–S42.
  91. Gureje O, Von Korff M, Kola L, et al. The relation between multiple pains and mental disorders: results from the World Mental Health Surveys. *Pain.* 2008;135(1–2):82–91.
  92. Kobus AM, Smith DH, Morasco BJ, et al. Correlates of higher-dose opioid medication use for low back pain in primary care. *J Pain.* 2012;13(11):1131–1138.
  93. Morasco BJ, Duckart JP, Carr TP, et al. Clinical characteristics of veterans prescribed high doses of opioid medications for chronic non-cancer pain. *Pain.* 2010;151(3):625–632.
  94. Novak SP, Herman-Stahl M, Flannery B, et al. Physical pain, common psychiatric and substance use disorders, and the non-medical use of prescription analgesics in the United States. *Drug Alcohol Depend.* 2009;100(1–2):63–70.
  95. Seal KH, Shi Y, Cohen G, et al. Association of mental health disorders with prescription opioids and high-risk opioid use in US veterans of Iraq and Afghanistan. *JAMA.* 2012;307(9):940–947.
  96. Weisner CM, Campbell CI, Ray GT, et al. Trends in prescribed opioid therapy for non-cancer pain for individuals with prior substance use disorders. *Pain.* 2009;145(3):287–293.
  97. Blanco C, Iza M, Schwartz RP, et al. Probability and predictors of treatment-seeking for prescription opioid use disorders: a national study. *Drug Alcohol Depend.* 2013;131(1–2):143–148.
  98. Blanco C, Alderson D, Ogburn E, et al. Changes in the prevalence of non-medical prescription drug use and drug use disorders in the United States: 1991–1992 and 2001–2002. *Drug Alcohol Depend.* 2007;90(2–3):252–260.
  99. Zacny J, Bigelow G, Compton P, et al. College on Problems of Drug Dependence taskforce on prescription opioid non-medical use and abuse: position statement. *Drug Alcohol Depend.* 2003;69(3):215–232.
  100. Substance Abuse and Mental Health Services Administration. *National Survey on Drug Use and Health Public Use Files, 2002–2013.* Ann Arbor, MI: Inter-University Consortium for Political and Social Research; 2002–2013.
  101. Gruzca RA, Abbacchi AM, Przybeck TR, et al. Discrepancies in estimates of prevalence and correlates of substance use and disorders between two national surveys. *Addiction.* 2007;102(4):623–629.
  102. Connery HS. Medication-assisted treatment of opioid use disorder: review of the evidence and future directions. *Harv Rev Psychiatry.* 2015;23(2):63–75.
  103. Fullerton CA, Kim M, Thomas CP, et al. Medication-assisted treatment with methadone: assessing the evidence. *Psychiatr Serv.* 2014;65(2):146–157.
  104. Thomas CP, Fullerton CA, Kim M, et al. Medication-assisted treatment with buprenorphine: assessing the evidence. *Psychiatr Serv.* 2014;65(2):158–170.



## POSTTEST

To obtain credit, go to [PSYCHIATRIST.COM](http://PSYCHIATRIST.COM) (Keyword: June)

to take this Posttest and complete the Evaluation. A nominal processing fee is required.

1. You treat patients among the following demographic groups. Which of your patients are at highest risk for nonmedical prescription opioid use (NMPOU) and DSM-5 nonmedical prescription opioid use disorder (NMPOUD)?
  - a. Women older than 65 years and in higher income categories
  - b. Asian or Hispanic individuals who attended college and are married
  - c. Those younger than 65 years who are widowed/separated/divorced and in lower income categories
2. What are the main clinical correlates of both 12-month and lifetime NMPOU and NMPOUD?
  - a. NMPOU and NMPOUD are not associated with psychiatric comorbidity
  - b. NMPOU and NMPOUD are strongly related to other nonmedical prescription drug use disorders, alcohol use disorder, nicotine use disorder, mood disorders, posttraumatic stress disorder, and personality disorders
  - c. NMPOU and NMPOUD are strongly related to bipolar II disorder, panic disorder, and specific phobias