Annals of Internal Medicine

ORIGINAL RESEARCH

Prescription Opioid Use, Misuse, and Use Disorders in U.S. Adults: 2015 National Survey on Drug Use and Health

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Background: Despite the continuing epidemic of opioid misuse, data on the prevalence of prescription opioid use, misuse, and use disorders are limited.

Objective: To estimate the prevalence of prescription opioid use, misuse, and use disorders and motivations for misuse among U.S. adults.

Design: Survey.

Setting: The 2015 National Survey on Drug Use and Health (NSDUH).

Participants: 72 600 eligible civilian, noninstitutionalized adults were selected for NSDUH, and 51 200 completed the survey interview.

Measurements: Prescription opioid use, misuse, and use disorders.

Results: Weighted NSDUH estimates suggested that, in 2015, 91.8 million (37.8%) U.S. civilian, noninstitutionalized adults used prescription opioids; 11.5 million (4.7%) misused them; and 1.9 million (0.8%) had a use disorder. Among adults with prescription opioid use, 12.5% reported misuse; of these, 16.7% reported a prescription opioid use disorder. The most commonly reported motivation for misuse was to relieve physical pain (63.4%). Misuse and use disorders were most commonly reported in adults who were uninsured, were unemployed, had low income, or had behavioral health problems. Among adults with misuse, 59.9% reported using opioids without a prescription, and 40.8% obtained prescription opioids for free from friends or relatives for their most recent episode of misuse.

Limitation: Cross-sectional, self-reported data.

Conclusion: More than one third of U.S. civilian, noninstitutionalized adults reported prescription opioid use in 2015, with substantial numbers reporting misuse and use disorders. Relief from physical pain was the most commonly reported motivation for misuse. Economic disadvantage and behavioral health problems may be associated with prescription opioid misuse. The results suggest a need to improve access to evidence-based pain management and to decrease excessive prescribing that may leave unused opioids available for potential misuse.

Primary Funding Source: U.S. Department of Health and Human Services.

Ann Intern Med. doi:10.7326/M17-0865 **Annals.org**
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This article was published at Annals.org on 1 August 2017.

The United States is experiencing an epidemic of prescription opioid misuse, with prescription opioid overdose deaths more than quadrupling between 1999 and 2015 (1–4). Misuse is defined as use of a psychotropic medication without a prescription; for a reason other than as directed by a physician; or in greater amounts, more often, or longer than prescribed. The potential for misuse complicates prescription of opioids (5, 6). Several studies based on local data (7–11) or national samples of high school seniors (12, 13) have examined motivations for medication misuse. However, an examination of the prevalence of prescription opioid use, misuse, and use disorders and motivations for misuse in the U.S. adult population has been lacking. Such data could inform efforts to reduce prescription opioid misuse and related morbidity and mortality.

Based on a nationally representative sample of U.S. adults, this study examined the 12-month prevalence of prescription opioid use by sociodemographic characteristics, health conditions, and behavioral health status; the prevalence of misuse and use disorders among prescription opioid users by sociodemographic characteristics, health conditions, and behavioral health status; motivations for misuse; and sources of prescription opioids among adults with misuse and use disorders.

METHODS

Survey Methods and Study Population

The 2015 National Survey on Drug Use and Health (NSDUH) was a face-to-face household interview survey conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA). The NSDUH used a stratified, multistage area probability sample that was designed to be representative of the nation as a whole as well as each of the 50 states and the District of Columbia. Under a stratified design, with states serving as the primary strata and state sampling regions serving as the secondary strata, census tracts, census block groups, segments within census block groups, and dwelling units within segments were selected using probability-proportional-to-size sampling. After dwelling units were selected, an interviewer visited each unit to obtain a roster of all persons residing there. The roster information obtained from an eligible member of the dwelling unit was used to select 0 to 2 people for the survey.

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Data collection for NSDUH was approved by the Institutional Review Board at RTI International. Data were collected by interviewers in personal visits to households and noninstitutional group quarters. Each participant provided verbal informed consent. The interview lasted about an hour, and each respondent received $30 in cash after completion (14).

The NSDUH collected nationally representative data on prescription opioid use, misuse, and use disorders and motivations for misuse among the U.S. civilian, noninstitutionalized population aged 12 years or older (14). Additional details about the NSDUH survey methods and questionnaire are available at SAMHSA's Web site (14). The NSDUH collected data using audio computer-assisted self-interviewing, in which respondents read or listened to the questions on headphones and then entered their answers directly into a laptop computer. This interview technique is designed for accurate reporting of information by providing respondents with a private, confidential way to record answers to sensitive questions. The NSDUH also used computer-assisted personal interviewing, in which interviewers read less sensitive questions to respondents and entered answers into the laptop computer.

In 2015, the NSDUH screening process (in which an interviewer visited each selected dwelling unit to obtain a roster of all persons residing there) was completed at 132 210 addresses, and the weighted screening response rate was 79.7%, which was not specific to age groups (14). The weighted interview response rate was 68.4% for adults, based on the definitions of the American Association for Public Opinion Research (15). A total of 72 600 eligible persons aged 18 years or older were selected for the 2015 NSDUH, and 51 200 completed the survey interview.

Measures of Main Outcomes and Patient Characteristics

The 2015 NSDUH asked about lifetime and past-year use and misuse of prescription opioids. The NSDUH defined prescription opioid misuse as "in any way that a doctor did not direct you to use them, including 1) use without a prescription of your own; 2) use in greater amounts, more often, or longer than you were told to take them; or 3) use in any other way a doctor did not direct you to use them" (16). Past-year prescription opioid use disorder was defined on the basis of the 11 diagnostic criteria for prescription opioid dependence or abuse specified in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV), including withdrawal; tolerance; use in dangerous situations; trouble with the law; and interference with major obligations at work, school, or home (17).

For respondents who reported prescription opioid misuse in the past year, NSDUH asked about the main motivation for the most recent episode with multiple-choice questions that offered the following options: to relieve physical pain, to relax or relieve tension, to experiment or see what the drug was like, to feel good or get high, to help with sleep, to help with feelings or emotions, to increase or decrease the effects of other drugs, because the respondent was "hooked" or had to have it, or other reason (16). The source of prescription opioids for the most recent episode of misuse was assessed with a multiple-choice question that offered the following options: obtained from a friend or relative for free; prescribed by a physician; stolen from a friend or relative; bought from a friend or relative; bought from a drug dealer or stranger; or stolen from a physician's office, clinic, or pharmacy. If respondents reported that they obtained the prescription opioids from a friend or relative for free, NSDUH asked them where the friend or relative had obtained the opioids.

In addition to sociodemographic characteristics (age, sex, race/ethnicity, educational attainment, employment status, family income, marital status, health insurance, metropolitan statistical area, and census region), NSDUH asked respondents about lifetime and past-year use of tobacco, alcohol, cannabis, cocaine, heroin, hallucinogens, and inhalants as well as lifetime and past-year use and misuse of prescription sedatives, tranquilizers, and stimulants. Using survey items assessing DSM-IV diagnostic criteria, the NSDUH estimated prevalence in the past 12 months of major depressive episode and substance use disorders (alcohol, cannabis, cocaine, heroin, hallucinogens, inhalants, prescription tranquilizers or sedatives, and prescription stimulants) in addition to prescription opioid use disorders (17). Nicotine dependence among cigarette smokers was assessed using the Nicotine Dependence Syndrome Scale (18). These measures of substance use and use disorders have demonstrated good validity and reliability (19–21). For example, the 2006 NSDUH Reliability Study reported that the κ coefficient (a standard measure of test–retest agreement) was 0.73 for prescription opioid misuse and 0.62 for illicit drug use disorders, suggesting good to excellent reliability (21). Furthermore, a clinical validation study reported sensitivity of 0.85 and specificity of 0.75 for illicit drug use disorders (including prescription opioid use disorder) (20). Finally, the survey asked about medical diagnoses received from a physician or other health care professional (hypertension, heart disease, diabetes mellitus, chronic obstructive pulmonary disease, asthma, cancer, HIV/AIDS, hepatitis B or C, cirrhosis, and kidney disease), respondents' self-rated health, and the number of emergency department visits in the prior year.

Among the 2015 NSDUH adult participants, item response rates were high (for example, >99% for the prescription opioid misuse and use disorder variables). Furthermore, missing values are imputed in NSDUH using predictive mean neighborhoods (22, 23), a combination of a model-assisted imputation method and a random nearest-neighbor hot-deck procedure. For prescription opioid use, misuse, and use disorders (the main variables of this study), a modified version of

predictive mean neighborhoods was used to cycle through a group of variables being imputed as a set (23).

Statistical Analysis

We estimated the national 12-month prevalence of prescription opioid use overall and by sociodemographic, health, and behavioral health characteristics. Next, among adults with prescription opioid use in the past 12 months, we estimated the national 12-month prevalence of prescription opioid misuse and use disorders overall and by sociodemographic, health, and behavioral health characteristics. Finally, we assessed the main motivations and the sources of prescription opioids for the most recent episode of misuse. We used SUDAAN software (RTI International) (24) to account for the complex sample design and sample weights of NSDUH. The NSDUH weighting procedures adjusted for nonresponse through direct adjustments as well as an indirect adjustment via poststratification (25).

Table 1. 12-Month Prevalence of Any Use of Prescription Opioids Among U.S. Adults, and Prevalence of Prescription Opioid Use Without Misuse, Misuse Without Use Disorders, and Use Disorders Among U.S. Adults With Prescription Opioid Use in the Past 12 Months, by Sociodemographic Characteristics*

Characteristic	Any Use of Prescription Opioids Among All Adults (*n* = 51 200)	Adults With Prescription Opioid Use (*n* = 19 000)		
		Prescription Opioid Use Without Misuse	Prescription Opioid Misuse Without Use Disorder	Prescription Opioid Use Disorder
Overall	37.8 (37.14–38.52)	87.5 (86.86–88.12)	10.4 (9.86–11.00)	2.1 (1.84–2.34)
Age				
18–29 y	35.7 (34.81–36.52)	76.4 (75.15–77.56)	20.1 (19.00–21.28)	3.5 (2.99–4.11)
30–49 y	37.0 (36.05–37.93)	85.4 (84.38–86.39)	11.8 (10.94–12.72)	2.8 (2.33–3.33)
≥50 y	39.5 (38.31–40.69)	93.7 (92.73–94.58)	5.3 (4.52–6.20)	1.0 (0.69–1.41)
Sex				
Male	35.3 (34.41–36.23)	84.3 (83.29–85.34)	12.8 (11.89–13.75)	2.9 (2.47–3.33)
Female	40.2 (39.22–41.12)	90.1 (89.34–90.75)	8.5 (7.87–9.16)	1.4 (1.18–1.78)
Race/ethnicity				
Non-Hispanic white	40.0 (39.14–40.82)	87.9 (87.13–88.62)	10.0 (9.31–10.65)	2.1 (1.86–2.47)
Non-Hispanic black	40.0 (38.21–41.90)	89.0 (87.01–90.73)	9.1 (7.78–10.69)	1.9 (1.20–2.87)
Hispanic	31.5 (29.89–33.04)	83.8 (81.80–85.71)	14.1 (12.29–16.08)	2.1 (1.42–3.02)
Non-Hispanic other	29.5 (27.07–32.06)	87.5 (84.68–89.90)	10.6 (8.29–13.35)	1.9 (1.27–2.90)
Education				
Less than high school	37.3 (35.37–39.17)	84.8 (82.71–86.66)	12.2 (10.55–14.17)	3.0 (2.14–4.07)
High school	38.9 (37.64–40.17)	87.3 (86.18–88.40)	10.1 (9.17–11.15)	2.6 (2.08–3.12)
Some college	42.7 (41.66–43.82)	86.6 (85.53–87.60)	11.2 (10.31–12.19)	2.2 (1.81–2.63)
College graduate	32.1 (30.91–60.99)	90.3 (89.07–91.32)	8.7 (7.72–9.80)	1.0 (0.71–2.63)
Health insurance				
Private only	34.6 (33.81–45.46)	87.3 (86.41–88.09)	11.1 (10.33–11.88)	1.6 (1.36–2.00)
Uninsured	31.6 (29.94–33.36)	73.9 (71.00–76.56)	21.1 (18.72–23.70)	5.0 (3.90–6.43)
Medicaid only	47.9 (46.24–49.57)	85.5 (83.84–86.93)	11.0 (9.82–12.35)	3.5 (2.77–4.47)
Other	41.6 (40.11–43.17)	93.8 (92.73–94.77)	5.3 (4.39–6.26)	0.9 (0.62–1.38)
Marital status				
Married	36.2 (35.20–37.12)	91.5 (90.69–92.29)	7.4 (6.62–8.12)	1.1 (0.87–1.48)
Widowed	41.0 (37.93–44.15)	92.4 (90.00–94.34)	6.0 (4.30–8.18)	1.6 (0.84–3.02)
Divorced/separated	45.5 (43.71–47.36)	88.2 (86.57–89.65)	9.3 (7.95–10.77)	2.5 (1.88–3.44)
Never married	36.4 (35.47–37.34)	78.0 (76.66–79.19)	18.3 (17.16–19.50)	3.7 (3.21–4.38)
Employment status				
Full-time	34.9 (34.03–35.72)	86.2 (85.25–87.00)	11.7 (10.93–12.54)	2.1 (1.78–2.57)
Part-time	36.5 (34.88–38.07)	85.2 (83.36–86.89)	12.7 (11.10–14.40)	2.1 (1.55–2.91)
Disabled	69.1 (66.09–71.95)	90.2 (87.83–92.14)	7.4 (5.71–9.53)	2.4 (1.57–3.69)
Unemployed	40.1 (37.60–42.65)	77.2 (73.84–80.33)	16.6 (14.12–19.40)	6.2 (4.33–8.68)
Other	37.4 (36.04–38.76)	91.7 (90.54–92.64)	7.2 (6.27–8.31)	1.1 (0.89–1.42)
Family income				
<$20 000	41.1 (39.68–42.62)	84.2 (82.62–85.75)	12.6 (11.27–13.98)	3.2 (2.52–4.03)
$20 000–$49 999	39.1 (37.99–40.27)	86.4 (85.24–87.51)	11.3 (10.27–12.37)	2.3 (1.89–2.80)
$50 000–$74 999	36.8 (35.26–38.39)	89.2 (87.80–90.50)	8.7 (7.55–9.97)	2.1 (1.56–2.79)
≥$75 000	35.5 (34.41–36.68)	89.5 (88.43–90.53)	9.2 (8.30–10.27)	1.3 (0.93–1.65)
Region				
Northeast	34.9 (33.48–36.36)	87.5 (85.91–88.97)	10.6 (9.25–12.07)	1.9 (1.45–2.50)
Midwest	37.1 (35.85–38.39)	88.2 (86.81–89.37)	9.9 (8.77–11.06)	2.0 (1.49–2.67)
South	39.3 (38.16–40.48)	88.0 (87.00–89.03)	9.7 (8.86–10.64)	2.2 (1.87–2.69)
West	38.4 (36.87–39.86)	86.0 (84.55–87.31)	12.0 (10.71–13.37)	2.0 (1.55–2.67)
Metropolitan statistical area				
Large	36.0 (35.10–36.90)	86.7 (95.69–87.65)	11.3 (10.44–12.22)	2.0 (1.65–2.41)
Small	40.1 (38.84–41.39)	88.2 (87.13–89.12)	9.7 (8.87–10.62)	2.1 (1.72–2.61)
Nonmetropolitan	39.9 (38.33–41.48)	88.7 (87.34–89.90)	9.0 (7.93–10.24)	2.3 (1.80–2.93)

* Values are weighted percentages (95% CIs). The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files be rounded to the nearest hundred to minimize potential disclosure risk.

Institutional Review Board Approval

The NSDUH data collection protocol was approved by the U.S. Office of Management and Budget and the Institutional Review Board at RTI International.

Role of the Funding Source

The funding sources supported the authors, who were responsible for preparation, review, and approval of the manuscript and the decision to submit the manuscript for publication. The funding sources had no role in the design and conduct of the study, analysis and interpretation of the data, preparation and review of the manuscript, or the decision to submit the manuscript for publication. The funding sources reviewed and approved the manuscript.

RESULTS

National Prevalence of Prescription Opioid Use, Misuse, and Use Disorders

On the basis of the 51 200 adult respondents to the 2015 NSDUH, we estimated that among civilian, noninstitutionalized U.S. adults aged 18 years or older, 37.8% (95% CI, 37.14% to 38.52%) or 91.8 million (CI, 89.61 to 94.08 million) used prescription opioids in the prior year, 4.7% (CI, 4.49% to 4.97%) or 11.5 million (CI, 10.88 to 12.10 million) misused them, and 0.8% (CI, 0.69% to 0.89%) or 1.9 million (CI, 1.68 to 2.15 million) had a use disorder. Among adults with prescription opioid use, the 12-month prevalence of misuse was 12.5% (CI, 11.88% to 13.14%) and the 12-month prevalence of prescription opioid use disorders was 2.1% (CI, 1.84% to 2.34%). Among adults with prescription opioid misuse, the 12-month prevalence of prescription opioid use disorders was 16.7% (CI, 14.85% to 18.49%).

Among adults reporting misuse of prescription opioids in 2015, 59.9% (CI, 57.26% to 62.56%) used them without a prescription, 22.2% (CI, 19.93% to 24.43%) used them in greater amounts than directed on their prescription, 14.6% (CI, 12.82% to 16.34%) used them more often than directed, and 13.1% (CI, 11.42% to 14.68%) used them longer than directed. These categories were not mutually exclusive.

Table 1 shows the 12-month prevalence of prescription opioid use, misuse, and use disorders by patient sociodemographic characteristics. Of note, adults aged 18 to 49 years had a lower prevalence of prescription opioid use than older adults (35.7% to 37.0% vs. 39.5%). Men had a lower prevalence of prescription opioid use than women (35.3% vs. 40.2%), and Hispanic persons had a lower prevalence than non-Hispanic white persons (31.5% vs. 40.0%). College graduates had a lower prevalence of prescription opioid use than adults with less than a high school education (32.1% vs. 37.3%), whereas those with some college education but without a degree had a higher prevalence (42.7% vs. 37.3%). Compared with adults with private health insurance only, uninsured adults had a lower prevalence of prescription opioid use (31.6% vs. 34.6%), whereas Medicaid beneficiaries had a higher prevalence (47.9% vs. 34.6%).

Among adults with prescription opioid use, misuse without use disorders and use disorders were more commonly reported in those who had lower family incomes or were uninsured or unemployed (Table 1). Specifically, those with an annual family income less than $50 000 had higher rates than those with an annual family income of $75 000 or more (11.3% to 12.6% vs. 9.2% and 2.3% to 3.2% vs. 1.3%, respectively), uninsured persons had higher rates than those with private health insurance only (21.1% vs. 11.1% and 5.0% vs. 1.6%, respectively), and unemployed persons had higher rates than those with full-time employment (16.6% vs. 11.7% and 6.2% vs. 2.1%, respectively).

The prevalence of prescription opioid use among adults varied by all examined underlying health conditions (Table 2). Adults with less than excellent self-rated health, with 1 or more emergency department visits, or with each of the health or behavioral health conditions had a higher prevalence of prescription opioid use than their counterparts without the corresponding characteristic. Among adults with prescription opioid use, those with fair or poor self-rated health or 3 or more emergency department visits had a higher estimated prevalence of use disorders than their counterparts without these characteristics. Adults with cancer had a higher prevalence of prescription opioid use without misuse (93.9% vs. 87.0%) and a lower prevalence of misuse without use disorders (5.3% vs. 10.8%) and use disorders (0.8% vs. 2.2%) than those without cancer. Among adults with prescription opioid use, the prevalence of misuse and use disorders varied by each of the examined mental health and substance use conditions. For example, those with a major depressive episode had higher prevalence of prescription opioid misuse without use disorders (16.2% vs. 9.6%) and use disorders (5.0% vs. 1.7%) than those without a major depressive episode. Similarly, adults with suicidal ideation had higher prevalence of prescription opioid misuse without use disorders (21.5% vs. 9.7%) and use disorders (8.8% vs. 1.7%) than those without suicidal ideation.

Motivations for Misuse and Sources of Misused Prescription Opioids

Among U.S. adults with prescription opioid misuse overall in 2015, 63.4% (CI, 60.92% to 65.86%) reported that the motivation for their most recent misuse was to relieve physical pain. Among adults with misuse but without use disorders, the most common motivation was relief from physical pain (66.3% [CI, 63.73% to 68.95%]), followed by relaxing (11.2% [CI, 9.48% to 13.00%]) and getting high (10.8% [CI, 9.24% to 12.33%]) (Table 3). Reported main motivations among adults with prescription opioid use disorders differed from those in adults with misuse without use disorders.

Among adults with prescription opioid misuse overall in 2015, 40.8% (CI, 38.30% to 43.24%) obtained prescription opioids free from friends or relatives for their most recent misuse. Among adults with use but

Table 2. 12-Month Prevalence of Any Use of Prescription Opioids Among U.S. Adults, and Prevalence of Prescription Opioid Use Without Misuse, Misuse Without Use Disorders, and Use Disorders Among U.S. Adults With Prescription Opioid Use in the Past 12 Months, by Health Conditions and Behavioral Health Status*

Characteristic	Any Use of Prescription Opioids Among All Adults (*n* = 51 200)	Adults With Prescription Opioid Use (*n* = 19 000)		
		Prescription Opioid Use Without Misuse	Prescription Opioid Misuse Without Use Disorder	Prescription Opioid Use Disorder
Health conditions				
Self-rated health				
Excellent	26.1 (25.01–27.26)	87.1 (85.35–88.55)	11.9 (10.52–13.51)	1.0 (0.63–1.67)
Very good	34.6 (33.62–35.67)	87.4 (86.38–88.42)	11.0 (10.08–12.00)	1.6 (1.25–1.94)
Good	42.3 (41.07–43.52)	87.3 (86.15–88.36)	10.5 (9.53–11.53)	2.2 (1.83–2.68)
Fair/poor	54.8 (52.85–56.75)	88.2 (86.66–89.62)	8.3 (7.13–9.57)	3.5 (2.78–4.43)
Past-year emergency department visit				
0	31.0 (30.30–31.78)	87.7 (86.86–88.45)	10.7 (9.95–11.44)	1.6 (1.37–1.98)
1	53.6 (51.80–55.38)	88.9 (87.59–90.12)	8.7 (7.71–9.87)	2.4 (1.82–3.05)
2	56.2 (53.91–58.46)	86.2 (84.37–87.84)	11.6 (10.09–13.28)	2.2 (1.60–3.04)
≥3	72.2 (69.29–74.94)	84.7 (81.94–87.04)	10.9 (8.89–13.27)	4.4 (3.19–6.11)
Hypertension				
Yes	46.1 (44.52–47.76)	91.9 (90.70–93.04)	6.0 (5.06–7.03)	2.1 (1.55–2.81)
No	35.8 (35.08–36.50)	86.1 (85.41–86.89)	11.8 (11.09–12.45)	2.1 (1.82–2.38)
Heart disease				
Yes	49.1 (46.83–51.32)	91.9 (90.16–93.36)	5.7 (4.45–7.18)	2.4 (1.65–3.58)
No	36.5 (35.81–37.22)	86.9 (86.20–87.53)	11.1 (10.50–11.73)	2.0 (1.79–2.29)
Diabetes mellitus				
Yes	48.9 (46.55–51.26)	91.6 (89.84–93.13)	6.9 (5.54–8.52)	1.5 (0.95–2.31)
No	36.5 (35.84–37.26)	86.9 (86.25–87.57)	10.9 (10.31–11.51)	2.2 (1.92–2.47)
Cancer				
Yes	45.8 (42.88–48.78)	93.9 (91.87–95.51)	5.3 (3.84–7.27)	0.8 (0.37–1.56)
No	37.3 (36.62–38.02)	87.0 (86.38–87.68)	10.8 (10.20–11.36)	2.2 (1.93–2.48)
Asthma				
Yes	47.1 (45.08–49.14)	87.3 (85.51–88.82)	10.3 (8.94–11.91)	2.4 (1.78–3.27)
No	36.9 (36.20–37.60)	87.6 (86.92–88.27)	10.4 (9.76–10.97)	2.0 (1.78–2.33)
Chronic obstructive pulmonary disease				
Yes	61.7 (58.28–65.00)	91.3 (89.17–93.11)	6.2 (4.71–8.01)	2.5 (1.62–3.85)
No	36.8 (36.07–37.46)	87.3 (86.60–87.93)	10.7 (10.09–11.28)	2.0 (1.80–2.33)
HIV/AIDS				
Yes	51.8 (38.86–64.42)	81.6 (67.54–90.48)	13.1 (6.22–25.51)	†
No	37.8 (37.13–38.51)	87.6 (86.95–88.20)	10.3 (9.79–10.92)	2.1 (1.83–2.34)
Hepatitis B or C				
Yes	59.6 (53.08–65.87)	83.0 (76.74–87.79)	12.4 (8.32–18.19)	4.6 (2.69–7.74)
No	37.6 (36.87–38.25)	87.7 (87.03–88.29)	10.3 (9.76–10.88)	2.0 (1.79–2.30)
Cirrhosis				
Yes	71.7 (59.23–81.51)	86.1 (73.57–93.26)	†	†
No	37.8 (37.07–38.45)	87.6 (86.94–88.19)	10.3 (9.81–10.93)	2.1 (1.83–2.34)
Kidney disease				
Yes	57.4 (52.43–62.24)	93.7 (89.99–96.13)	4.0 (2.27–7.06)	2.2 (0.92–5.36)
No	37.5 (36.76–38.14)	87.4 (86.73–88.00)	10.6 (9.99–11.14)	2.1 (1.84–2.35)
Mental health problems				
Major depressive episode				
Yes	56.7 (54.48–58.97)	78.8 (76.45–80.95)	16.2 (14.32–18.37)	5.0 (3.94–6.23)
No	36.4 (35.70–37.11)	88.5 (87.87–89.13)	9.6 (9.19–10.35)	1.7 (1.49–2.01)
Suicidal ideation				
Yes	54.1 (51.26–56.85)	69.7 (66.33–72.92)	21.5 (18.77–24.46)	8.8 (6.88–11.19)
No	37.2 (36.46–37.84)	88.6 (87.94–89.17)	9.7 (9.20–10.33)	1.7 (1.46–1.92)
Substance use problems				
Tobacco use and disorder				
Past-month nicotine dependence	52.5 (50.73–54.27)	76.1 (74.23–77.94)	17.3 (15.75–19.07)	6.5 (5.58–7.61)
Past-year use	41.0 (39.74–42.24)	82.0 (80.52–83.41)	15.3 (14.05–16.64)	2.7 (2.11–3.43)
Lifetime use but no past-year use	37.9 (36.78–39.05)	91.6 (90.69–92.45)	7.4 (6.61–8.22)	1.0 (0.70–1.46)
Never-use	30.3 (29.15–31.41)	93.3 (92.14–94.22)	6.4 (5.47–7.56)	0.3 (0.18–0.52)
Alcohol use and disorder				
Past-year use disorder	50.3 (48.02–52.56)	64.3 (61.42–67.13)	28.2 (25.64–30.99)	7.4 (5.99–9.20)
Past-year use but no use disorder	38.0 (37.25–38.82)	88.0 (87.26–88.72)	10.4 (9.79–11.12)	1.6 (1.31–1.86)
Lifetime use but no past-year use	41.7 (40.08–43.43)	92.8 (91.44–93.95)	4.8 (3.87–5.96)	2.4 (1.78–3.23)
Never-use	26.5 (24.82–28.25)	94.1 (92.34–95.43)	5.5 (4.19–7.23)	0.4 (0.22–0.78)

Continued on following page

Table 2–Continued

Characteristic	Any Use of Prescription Opioids Among All Adults (*n* = 51 200)	Adults With Prescription Opioid Use (*n* = 19 000)		
		Prescription Opioid Use Without Misuse	Prescription Opioid Misuse Without Use Disorder	Prescription Opioid Use Disorder
Cannabis use and disorder				
Past-year use disorder	61.3 (57.52–64.88)	48.4 (42.98–53.81)	39.6 (34.47–44.97)	12.0 (9.15–15.64)
Past-year use but no use disorder	48.8 (47.17–50.48)	70.2 (68.18–72.18)	25.1 (23.27–26.93)	4.7 (3.99–5.59)
Lifetime use but no past-year use	43.5 (42.39–44.67)	88.6 (87.56–89.59)	9.1 (8.25–10.03)	2.3 (1.83–2.85)
Never-use	31.1 (30.21–32.03)	94.7 (93.96–95.39)	4.8 (4.19–5.57)	0.5 (0.29–0.70)
Cocaine use and disorder				
Past-year use disorder	71.7 (62.58–79.38)	31.7 (21.99–43.19)	36.8 (26.73–48.27)	31.5 (22.04–42.82)
Past-year use but no disorder	61.0 (56.85–65.01)	48.5 (42.92–54.16)	41.5 (36.23–46.97)	10.0 (7.11–13.86)
Lifetime use but no past-year use	52.2 (50.40–53.98)	77.5 (75.63–79.27)	17.3 (15.71–19.03)	5.2 (4.36–6.18)
Never-use	34.9 (34.14–35.61)	91.7 (91.14–92.28)	7.5 (6.94–8.04)	0.8 (0.64–1.00)
Heroin use and disorder				
Past-year use or disorder	90.1 (83.77–94.11)	20.3 (13.83–28.76)	37.4 (28.99–46.55)	42.3 (34.37–50.76)
Lifetime use but no past-year use	68.8 (63.95–73.32)	60.8 (54.97–66.42)	27.0 (22.17–32.42)	12.2 (9.25–15.84)
Never-use	37.1 (36.40–37.78)	88.9 (88.35–89.53)	9.7 (9.11–10.20)	1.4 (1.20–1.63)
Hallucinogen use and disorder				
Past-year use or use disorder	53.9 (50.15–57.00)	43.7 (38.86–48.75)	46.5 (41.66–51.31)	9.8 (7.50–12.72)
Lifetime use but no past-year use	52.1 (50.38–53.77)	74.3 (72.34–76.08)	20.1 (18.46–21.80)	5.7 (4.82–6.65)
Never-use	35.0 (34.23–35.73)	92.4 (91.78–92.91)	6.7 (6.22–7.29)	0.9 (0.71–1.13)
Inhalant use and disorder				
Past-year use or use disorder	51.0 (43.63–58.25)	49.6 (39.04–60.14)	37.1 (28.21–46.88)	13.3 (8.12–21.20)
Lifetime use but no past-year use	53.2 (51.28–55.20)	69.4 (66.83–71.76)	24.2 (21.99–26.59)	6.4 (5.37–7.70)
Never-use	36.2 (35.47–36.19)	90.5 (89.88–91.05)	8.2 (7.64–8.73)	1.3 (1.14–1.61)
Prescription sedative/tranquilizer misuse and use disorder				
Past-year misuse or use disorder	71.6 (68.27–74.64)	34.2 (30.69–37.91)	46.9 (43.42–50.48)	18.9 (16.06–22.00)
Past-year use and lifetime misuse	75.3 (69.44–80.29)	63.1 (55.63–69.93)	26.3 (20.49–33.06)	10.6 (6.71–16.47)
Past-year use but no lifetime misuse	64.5 (62.81–66.16)	92.4 (91.43–93.27)	6.3 (5.51–7.16)	1.3 (0.94–1.84)
Lifetime use but no past-year use	39.4 (37.49–41.34)	90.0 (88.04–91.06)	9.3 (7.71–11.15)	0.7 (0.38–1.49)
Never-use	29.8 (29.09–30.51)	90.3 (89.53–91.05)	8.8 (8.08–9.54)	0.9 (0.71–1.14)
Prescription stimulant misuse and use disorder				
Past-year misuse or use disorder	59.0 (55.76–62.14)	37.5 (33.41–41.77)	47.2 (43.26–51.27)	15.3 (12.31–18.76)
Past-year use and lifetime misuse	65.3 (56.87–72.92)	52.8 (42.86–62.56)	36.0 (27.65–45.38)	11.2 (6.22–19.16)
Past-year use but no lifetime misuse	61.3 (58.31–64.22)	85.4 (82.84–87.60)	11.5 (9.63–13.81)	3.1 (2.01–4.63)
Lifetime use but no past-year use	48.1 (45.00–51.18)	84.9 (81.81–87.49)	11.9 (9.69–14.55)	3.2 (1.98–5.22)
Never-use	35.7 (34.96–36.41)	89.9 (89.28–90.56)	8.7 (8.11–9.30)	1.4 (1.16–1.64)

* Values are weighted percentages (95% CIs). The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files be rounded to the nearest hundred to minimize potential disclosure risk.
† Estimate suppressed because of low statistical precision.

without use disorders, the most commonly reported sources were friends or relatives for free (44.6% [CI, 41.79% to 47.39%]) or a physician (33.8% [CI, 30.95% to 36.55%]) (Table 4). Among those who obtained prescription opioids from friends or relatives for free, 86.5% (CI, 83.81% to 89.11%) reported that the friend or relative received the opioids from a physician. Compared with adults with misuse but without use disorders, those with use disorders were less likely to report that they obtained prescription opioids for the most recent episode of misuse from friends or relatives for free (21.8% vs. 44.6%) and were more likely to report that they bought them from friends or relatives (14.1% vs. 8.5%) or from drug dealers or strangers (13.8% vs. 3.1%).

DISCUSSION

The 2015 NSDUH indicates a high prevalence of prescription opioid use among adults in the United States, with roughly 1 in 3 adults (91.8 million) using them in the prior year. We also found that approximately 11.5 million adults reported misusing a prescription opioid at least once in the past year, and nearly 2 million had a use disorder. Among adults with prescription opioid misuse, 63.4% reported that the motivation for their most recent episode of misuse was relief from physical pain. Even among adults with prescription opioid use disorders, 48.7% reported relief from physical pain as the motivation for their most recent episode of misuse. Our results not only are consistent with previous estimates of high prevalence of pain in the United States (12, 26–30) but also show that physical pain is a common reason for prescription opioid use, even among adults with misuse and use disorders. Recent studies found a lack of data supporting the long-term effectiveness of opioids for chronic pain treatment and showed the well-documented increases in harms associated with increased opioid prescribing in the United States (31–34). Thus, our findings underscore the urgent need for more effective approaches to pain treatment, including increased access to high-quality evidence-based care, development of high-potency nonaddictive analgesics, and multimodal treatment of pain.

Table 3. Main Motivation for Misuse of Prescription Opioids Among Adults With Misuse and Use Disorder in Past 12 Months*

Main Motivation	Adults Reporting Misuse Without Use Disorder (*n* = 2500)	Adults Reporting Use Disorder (*n* = 500)
Relieve physical pain	66.3 (63.73–68.95)	48.7 (42.11–55.33)
Relax or relieve tension	11.2 (9.48–13.00)	8.9 (5.14–12.70)
Experiment	2.2 (1.63–2.73)	1.1 (0.36–1.74)
Get high or feel good	10.8 (9.24–12.33)	16.2 (11.90–20.40)
Help with sleep	4.6 (3.48–5.76)	3.7 (0.77–6.61)
Help with emotions or feelings	2.4 (1.64–3.12)	7.0 (6.11–7.92)
Increase/decrease effects of other drugs	0.9 (0.35–1.41)	†
Hooked or have to misuse	0.6 (0.22–0.96)	12.0 (8.66–15.24)
Other	1.0 (0.49–1.47)	†

* Values are weighted percentages (95% CIs). The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files be rounded to the nearest hundred to minimize potential disclosure risk.
† Estimate suppressed because of low statistical precision.

Our results are consistent with findings that pain is a poorly addressed clinical and public health problem in the United States and that it may be a key part of the pathway to misuse or addiction (26–30). Because pain is a symptom of many pathologic processes (26–29), better prevention and treatment of the underlying disorders are necessary to decrease pain and the morbidity and mortality associated with opioid misuse. Simply restricting access to opioids without offering alternative pain treatments may have limited efficacy in reducing prescription opioid misuse and could lead people to seek prescription opioids outside the health system or to use nonprescription opioids, such as heroin or illicitly made fentanyl, which could increase health, misuse, and overdose risks.

Among adults with misuse of prescription opioids, 59.9% used them without a prescription at least once in 2015, and 40.8% obtained them from friends or relatives for free for their most recent episode of misuse. Such widespread social availability of prescription opioids suggests that they are commonly dispensed in amounts not fully consumed by the patients to whom they are prescribed. Diversion is especially common when opioids are prescribed in greater quantities than needed or for conditions for which they have no benefit (26–29). Based on a widely used source of prescription activity data in the U.S. outpatient retail setting, a recent study found that only approximately 7.7% of persons with an opioid prescription were long-term patients (those with prescriptions for ≥90 days), whereas the majority received short-term prescriptions (35). Thus, it is likely that prescribing too many opioids for an acute pain episode leads to a surplus that can then be used at a later date or given to others. Diversion of prescription opioids also involves criminal activities, especially for those with use disorders (36). Consistent with a finding from a previous study (31), we found that 13.8% of adults with use disorders obtained their most recently misused prescription opioids from drug dealers or strangers.

Our findings highlight the importance of interventions targeting medication sharing, selling, and diversion (26, 37–39) and underscore the need to follow prescribing guidelines to minimize environmental availability of opioids due to excessively large numbers of leftover medications (for example, due to prescribing in larger amounts than required to address acute pain conditions [40, 41] and prescribing for conditions for which opioids have no benefit [26–29]). Recent federal legislation (32) allowing pharmacies to partially fill prescriptions may help alleviate the desire to prescribe larger quantities due to concerns about repeated clinical visits for pain that lasts longer than expected.

Consistent with prior findings (42), our study shows that adults with prescription opioid misuse and, even more strongly, prescription opioid use disorder had higher prevalence of a broad range of psychopathologic conditions, including other substance use disorders (such as heroin; cocaine; prescription sedatives, tranquilizers, or stimulants; and cannabis), depression, and suicidal ideation. Persons with these characteristics need to be prioritized for prevention, more intense monitoring, and screening for opioid use disorders when opioids are prescribed. Persons identified with prescription opioid misuse and use disorder should be queried about co-occurring behavioral health conditions and should be referred for treatment if these conditions are present. Key steps clinicians can take to identify misuse include routine use of prescription drug-monitoring programs to identify patients with prescription patterns suggesting misuse, screening patients for increased misuse risk before prescribing opioids, and inquiring about specific motivations for prescription opioid misuse (26–28, 32, 34, 42–44).

In addition, we found that uninsured adults, unemployed adults, and low-income adults had a higher prevalence of prescription opioid misuse and use dis-

Table 4. Source of Prescription Opioids Obtained for Most Recent Episode of Misuse Among Adults With Misuse and Use Disorder in Past 12 Months*

Source	Adults Reporting Misuse Without Use Disorder (*n* = 2500)	Adults Reporting Use Disorder (*n* = 500)
Obtained for free from friend/relative	44.6 (41.79–47.39)	21.8 (16.86–26.78)
Obtained from 1 physician	33.8 (30.95–36.55)	40.4 (34.08–46.62)
Obtained from >1 physician	1.3 (0.60–1.98)	3.9 (0.50–7.24)
Bought from friend/relative	8.5 (6.98–10.00)	14.1 (10.47–17.65)
Bought from drug dealer/stranger	3.1 (2.32–3.88)	13.8 (10.25–17.27)
Stolen from friend/relative	3.6 (2.53–4.61)	†
Stolen from physician's office, clinic, or pharmacy	0.5 (0.20–0.86)	†
Other	4.7 (3.41–5.95)	3.1 (1.22–5.06)

* Values are weighted percentages (95% CIs). The Substance Abuse and Mental Health Services Administration requires that any description of overall sample sizes based on the restricted-use data files be rounded to the nearest hundred to minimize potential disclosure risk.
† Estimate suppressed because of low statistical precision.

orders. This suggests that financial disadvantage may be associated with risk for misuse, especially in response to poor control of pain.

This study has several limitations. First, the NSDUH did not cover homeless persons not living in shelters, active-duty military personnel, or residents of institutions (for example, incarcerated adults). Our estimates of the national prevalence of prescription opioid misuse and use disorders may be underestimates because homeless adults not living in shelters and adults in the criminal justice system usually have higher prevalence of substance use and use disorders than general civilian, noninstitutionalized adults (45–47). Second, the 2015 NSDUH had a lower response rate compared with prior years, which increases the potential for nonresponse bias. Third, because of the cross-sectional nature of NSDUH, this study could not establish temporal or causal relationships. Fourth, NSDUH did not specify relief from withdrawal symptoms as a motivation for prescription opioid misuse. Fifth, research is needed to examine the validity of self-reported data on prescription opioid source and motivation for misuse. Finally, NSDUH data are subject to recall and social-desirability biases.

In 2015, more than a third of the U.S. adult population used prescription opioids, 11.5 million adults misused them, and 1.9 million had use disorders. Actions should be taken to expand safe, evidence-based pain treatment and decrease excessive prescribing that may leave unused opioids available for potential misuse.

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Note: Dr. Han had full access to all of the data in this study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Disclaimer: The findings and conclusions of this study are those of the authors and do not necessarily reflect the views of the Substance Abuse and Mental Health Services Administration, the National Institute on Drug Abuse of the National Institutes of Health, and the Office of the Assistant Secretary for Planning and Evaluation of the U.S. Department of Health and Human Services.

Financial Support: The NSDUH was supported by contracts from the Substance Abuse and Mental Health Services Administration. This study was jointly sponsored by the Substance Abuse and Mental Health Services Administration, the National Institute on Drug Abuse of the National Institutes of Health, and the Office of the Assistant Secretary for Planning and Evaluation of the U.S. Department of Health and Human Services.

Disclosures: Dr. Compton reports stock holdings in Pfizer, General Electric, and 3M Company. Dr. Blanco reports stock holdings in Eli Lilly, Sanofi, and General Electric. Authors not named here have disclosed no conflicts of interest. Disclosures can also be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M17-0865.

Reproducible Research Statement: *Study protocol and statistical code:* Available from Dr. Han (e-mail, Beth.Han@samhsa.hhs.gov). *Data set:* Available through application for data portal for restrictive NSDUH data (www.datafiles.samhsa.gov/info/data-portal-nid5).

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References

1. **Han B, Compton WM, Jones CM, Cai R.** Nonmedical prescription opioid use and use disorders among adults aged 18 through 64 years in the United States, 2003–2013. JAMA. 2015;314:1468-78. [PMID: 26461997] doi:10.1001/jama.2015.11859
2. **Compton WM, Volkow ND.** Major increases in opioid analgesic abuse in the United States: concerns and strategies. Drug Alcohol Depend. 2006;81:103-7. [PMID: 16023304]
3. **Compton WM, Boyle M, Wargo E.** Prescription opioid abuse: problems and responses. Prev Med. 2015;80:5-9. [PMID: 25871819] doi:10.1016/j.ypmed.2015.04.003
4. **Centers for Disease Control and Prevention.** Wide-ranging Online Data for Epidemiologic Research (WONDER). 2017. Accessed at http://wonder.cdc.gov on 31 March 2017.
5. **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 Study on Alcohol and Related Conditions. Psychol Med. 2012;42:1261-72. [PMID: 21999943] doi:10.1017/S0033291711002145
6. **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;131:143-8. [PMID: 23306097] doi:10.1016/j.drugalcdep.2012.12.013
7. **Rigg KK, Ibañez GE.** Motivations for non-medical prescription drug use: a mixed methods analysis. J Subst Abuse Treat. 2010;39:236-47. [PMID: 20667680] doi:10.1016/j.jsat.2010.06.004
8. **McCabe SE, Boyd CJ, Teter CJ.** Subtypes of nonmedical prescription drug misuse. Drug Alcohol Depend. 2009;102:63-70. [PMID: 19278795] doi:10.1016/j.drugalcdep.2009.01.007
9. **LeClair A, Kelly BC, Pawson M, Wells BE, Parsons JT.** Motivations for prescription drug misuse among young adults: considering social and developmental contexts. Drugs (Abingdon Engl). 2015;22:208-16. [PMID: 26709337]
10. **Kelly BC, Rendina HJ, Vuolo M, Wells BE, Parsons JT.** Influences of motivational contexts on prescription drug misuse and related drug problems. J Subst Abuse Treat. 2015;48:49-55. [PMID: 25115134] doi:10.1016/j.jsat.2014.07.005
11. **Evans TI, Liebling EJ, Green TC, Hadland SE, Clark MA, Marshall BDL.** Associations between physical pain, pain management, and frequency of nonmedical prescription opioid use among young adults: a sex-specific analysis. J Addict Med. 2017. [PMID: 28514234] doi:10.1097/ADM.0000000000000318
12. **McCabe SE, Cranford JA.** Motivational subtypes of nonmedical use of prescription medications: results from a national study. J Adolesc Health. 2012;51:445-52. [PMID: 23084165] doi:10.1016/j.jadohealth.2012.02.004
13. **McCabe SE, Boyd CJ, Cranford JA, Teter CJ.** Motives for nonmedical use of prescription opioids among high school seniors in the United States: self-treatment and beyond. Arch Pediatr Adolesc

Med. 2009;163:739-44. [PMID: 19652106] doi:10.1001/archpediatrics.2009.120
14. **Substance Abuse and Mental Health Services Administration.** National Survey on Drug Use and Health. 2017. Accessed at www.samhsa.gov/data/population-data-nsduh/reports?tab=38 on 22 May 2017.
15. **American Association for Public Opinion Research.** Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 8th ed. Lenexa, KS: American Association for Public Opinion Research; 2015:52-3.
16. **Hughes A, Williams MR, Lipari RN, Bose J, Copello EAP, Kroutil LA.** Prescription drug use and misuse in the United States: results from the 2015 National Survey on Drug Use and Health. NSDUH Data Review. September 2016. Accessed at www.samhsa.gov/data/sites/default/files/NSDUH-FFR2-2015/NSDUH-FFR2-2015.htm on 14 November 2016.
17. **American Psychiatric Association.** Diagnostic and Statistical Manual of Mental Disorders. 4th ed. Washington, DC: American Psychiatric Association; 1994.
18. **Shiffman S, Waters A, Hickcox M.** The Nicotine Dependence Syndrome Scale: a multidimensional measure of nicotine dependence. Nicotine Tob Res. 2004;6:327-48. [PMID: 15203807]
19. **Grucza RA, Abbacchi AM, Przybeck TR, Gfroerer JC.** Discrepancies in estimates of prevalence and correlates of substance use and disorders between two national surveys. Addiction. 2007;102:623-9. [PMID: 17309538]
20. **Jordan BK, Karg RS, Batts KR, Epstein JF, Wiesen C.** A clinical validation of the National Survey on Drug Use and Health assessment of substance use disorders. Addict Behav. 2008;33:782-98. [PMID: 18262368] doi:10.1016/j.addbeh.2007.12.007
21. **Substance Abuse and Mental Health Services Administration.** Reliability of Key Measures in the National Survey on Drug Use and Health. Office of Applied Studies Methodology Series M-8. HHS publication no. SMA 09-4425. Rockville: Substance Abuse and Mental Health Services Administration; 2010.
22. **Rubin DB.** Statistical matching using file concatenation with adjusted weights and multiple imputations. J Bus Econ Stat. 1986;4:87-94.
23. **Center for Behavioral Health Statistics and Quality.** 2015 National Survey on Drug Use and Health. Methodological Resource Book Section 10: Editing and Imputation Report. Rockville: Substance Abuse and Mental Health Services Administration; 2017. Accessed at www.samhsa.gov/data/sites/default/files/NSDUHmrbEditImputation2015.pdf on 23 May 2017.
24. **Research Triangle Institute.** SUDAAN [computer program]. Release 11.0.1. Research Triangle Park, NC: RTI International; 2015.
25. **Center for Behavioral Health Statistics and Quality.** 2015 National Survey on Drug Use and Health. Methodological Resource Book Section 11: Person-Level Sampling Weight Calibration. Rockville: Substance Abuse and Mental Health Services Administration; 2017. Accessed at www.samhsa.gov/data/sites/default/files/NSDUHmrbSamplingWgt2015.pdf on 23 May 2017.
26. **Institute of Medicine.** Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research. Washington, DC: National Academies Pr; 2011.
27. **Dowell D, Haegerich TM, Chou R.** CDC guideline for prescribing opioids for chronic pain—United States, 2016. JAMA. 2016;315:1624-45. [PMID: 26977696] doi:10.1001/jama.2016.1464
28. **Chou R, Deyo R, Devine B, Hansen R, Sullivan S, Jarvik JG, et al.** The Effectiveness and Risks of Long-Term Opioid Treatment of Chronic Pain. Evidence Reports/Technology Assessments no. 218. Report no. 14-E005-EF. Rockville: Agency for Healthcare Research and Quality; 2014. Accessed at www.ahrq.gov/research/findings/evidence-based-reports/opoidstp.html on 3 December 2016.
29. **Blanco C, Wall MM, Okuda M, Wang S, Iza M, Olfson M.** Pain as a predictor of opioid use disorder in a nationally representative sample. Am J Psychiatry. 2016;173:1189-95. [PMID: 27444794]
30. **Barth KS, Maria MM, Lawson K, Shaftman S, Brady KT, Back SE.** Pain and motives for use among non-treatment seeking individuals with prescription opioid dependence. Am J Addict. 2013;22:486-91. [PMID: 23952895] doi:10.1111/j.1521-0391.2013.12038.x
31. **Jones CM, Paulozzi LJ, Mack KA.** Sources of prescription opioid pain relievers by frequency of past-year nonmedical use United States, 2008–2011. JAMA Intern Med. 2014;174:802-3. [PMID: 24589763]
32. **American Society of Addiction Medicine.** Congress passes CARA! ASAM applauds passage of historic addiction legislation. 13 July 2016. Accessed at www.asam.org/magazine/read/article/2016/07/13/congress-passes-cara!-asam-applauds-passage-of-historic-addiction-legislation on 3 December 2016.
33. **Patrick SW, Fry CE, Jones TF, Buntin MB.** Implementation of prescription drug monitoring programs associated with reductions in opioid-related death rates. Health Aff (Millwood). 2016;35:1324-32. [PMID: 27335101] doi:10.1377/hlthaff.2015.1496
34. **Chou R, Turner JA, Devine EB, Hansen RN, Sullivan SD, Blazina I, et al.** The effectiveness and risks of long-term opioid therapy for chronic pain: a systematic review for a National Institutes of Health Pathways to Prevention Workshop. Ann Intern Med. 2015;162:276-86. [PMID: 25581257] doi:10.7326/M14-2559
35. **Hwang CS, Kang EM, Kornegay CJ, Staffa JA, Jones CM, McAninch JK.** Trends in the concomitant prescribing of opioids and benzodiazepines, 2002–2014. Am J Prev Med. 2016;51:151-60. [PMID: 27079639] doi:10.1016/j.amepre.2016.02.014
36. **Inciardi JA, Surratt HL, Lugo Y, Cicero TJ.** The diversion of prescription opioid analgesics. Law Enforc Exec Forum. 2007;7:127-41. [PMID: 25267926]
37. **Compton WM, Jones CM, Baldwin GT.** Relationship between nonmedical prescription-opioid use and heroin use. N Engl J Med. 2016;374:154-63. [PMID: 26760086] doi:10.1056/NEJMra1508490
38. **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. [PMID: 23410617] doi:10.1016/j.drugalcdep.2013.01.007
39. **Jones CM, Lurie P, Woodcock J.** Addressing prescription opioid overdose: data support a comprehensive policy approach. JAMA. 2014;312:1733-4. [PMID: 25275855] doi:10.1001/jama.2014.13480
40. **Harris K, Curtis J, Larsen B, Calder S, Duffy K, Bowen G, et al.** Opioid pain medication use after dermatologic surgery: a prospective observational study of 212 dermatologic surgery patients. JAMA Dermatol. 2013;149:317-21. [PMID: 23682368]
41. **Bates C, Laciak R, Southwick A, Bishoff J.** Overprescription of postoperative narcotics: a look at postoperative pain medication delivery, consumption and disposal in urological practice. J Urol. 2011;185:551-5. [PMID: 21168869] doi:10.1016/j.juro.2010.09.088
42. **Blanco C, Rafful C, Wall MM, Jin CJ, Kerridge B, Schwartz RP.** The latent structure and predictors of non-medical prescription drug use and prescription drug use disorders: a national study. Drug Alcohol Depend. 2013;133:473-9. [PMID: 23962421] doi:10.1016/j.drugalcdep.2013.07.011
43. **Larochelle MR, Liebschutz JM, Zhang F, Ross-Degnan D, Wharam JF.** Opioid prescribing after nonfatal overdose and association with repeated overdose: a cohort study. Ann Intern Med. 2016;164:1-9. [PMID: 26720742] doi:10.7326/M15-0038
44. **Gwira Baumblatt JA, Wiedeman C, Dunn JR, Schaffner W, Paulozzi LJ, Jones TF.** High-risk use by patients prescribed opioids for pain and its role in overdose deaths. JAMA Intern Med. 2014;174:796-801. [PMID: 24589873]
45. **Ferguson KM, Bender K, Thompson SJ.** Gender, coping strategies, homelessness stressors, and income generation among homeless young adults in three cities. Soc Sci Med. 2015;135:47-55. [PMID: 25942470] doi:10.1016/j.socscimed.2015.04.028
46. **Saloner B, Bandara SN, McGinty EE, Barry CL.** Justice-involved adults with substance use disorders: coverage increased but rates of treatment did not in 2014. Health Aff (Millwood). 2016;35:1058-66. [PMID: 27269023] doi:10.1377/hlthaff.2016.0005
47. **Compton WM, Dawson D, Duffy SQ, Grant BF.** The effect of inmate populations on estimates of DSM-IV alcohol and drug use disorders in the United States [Letter]. Am J Psychiatry. 2010;167:473-4. [PMID: 20360330] doi:10.1176/appi.ajp.2009.09081087

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