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Short communication

Co-occurring substance use and mental disorders among adults with opioid use disorder

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ABSTRACT

Background: Co-occurring substance use and mental disorders among people with opioid use disorder (OUD) increase risk for morbidity and mortality. Addressing these co-occurring conditions is critical for improving treatment and health outcomes. There is limited recent research on the prevalence of co-occurring disorders, demographic characteristics associated with co-occurring disorders, and receipt of mental health and substance use treatment services among those with OUD. This limits the development of targeted and resourced policies and clinical interventions.

Methods: Using 2015–2017 National Survey on Drug Use and Health data, prevalence of co-occurring substance use and mental disorders and receipt of mental health and substance use treatment services was estimated for adults aged 18–64 with OUD. Multivariable logistic regression assessed demographic and substance use characteristics associated with past-year mental illness (AMI) and serious mental illness (SMI) among adults with OUD as well as treatment receipt.

Results: Among adults with OUD, prevalence of specific co-occurring substance use disorders ranged from 26.4% (95% CI:23.6%–29.4%) for alcohol to 10.6% (95% CI:8.6%–13.0%) for methamphetamine. Prevalence of AMI was 64.3% (95% CI:60.4%–67.9%) and SMI was 26.9% (95% CI:24.2%–29.8%). Receiving both mental health and substance use treatment services in the past year was reported by 24.5% (95% CI:21.5%–29.9%) of adults with OUD and AMI and 29.6% (95% CI:23.3%–36.7%) of adults with OUD and SMI.

Conclusions: Co-occurring substance use and mental disorders are common among adults with OUD. Expanding access to comprehensive service delivery models that address the substance use and mental health co-morbidities of this population is urgently needed.

1. Introduction

Combating the opioid crisis is a public health priority in the United States. Opioid-related emergency department visits increased 30% between July 2016 and September 2017, and in 2016, over 42,000 Americans died from an opioid overdose (Vivolo-Kantor et al., 2018; Jones et al., 2018). Investigations of overdose events show that opioid use disorder (OUD) is a common characteristic among individuals experiencing an overdose, as is the co-use of other substances, including benzodiazepines, cocaine, and alcohol (Hall et al., 2008; Bohnert et al., 2011; Johnson et al., 2013; Campbell et al., 2018; Jones et al., 2018). In addition, co-occurring mental illness has been linked to increased risk for opioid misuse and overdose (Johnson et al., 2013; Campbell et al., 2018).

Addressing co-occurring substance use and mental disorders is critical for improving morbidity and mortality outcomes among individuals with OUD. Yet, there is limited recent research on the prevalence of co-occurring disorders, demographic characteristics associated with co-occurring disorders, and receipt of mental health and substance use treatment services among those with OUD. This information gap limits the ability of public health practitioners, clinicians, and policymakers to appropriately target and resource policy, programmatic, and clinical interventions to meet the needs of this high-risk and clinically complex population. Using nationally representative data, we estimate prevalence and correlates of co-occurring substance use and mental disorders and receipt of mental health and substance use disorder treatment services among adults with OUD in the U.S.

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2. Materials and methods

2.1. Data source

Data are from the 170,300 adults aged 18–64 years participating in the 2015–2017 National Surveys on Drug Use and Health (NSDUH), conducted by the Substance Abuse and Mental Health Services Administration. NSDUH provides nationally representative data on substance use among the U.S. civilian, noninstitutionalized population (Substance Abuse and Mental Health Services Administration, 2017).

2.2. Measures

NSDUH defines past-year substance use disorder based on responses to questions modeled after the diagnostic criteria for dependence or abuse of specific substances (alcohol, cannabis, cocaine, heroin, methamphetamine, sedatives, tranquilizers, prescription opioids) in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (American Psychiatric Association, 1994). For this analysis, past-year OUD is defined as meeting diagnostic criteria for a prescription opioid use disorder, a heroin use disorder, or both in the past year; past-year prescription opioid use disorder only (RxOUD) defined as having a prescription opioid use disorder in the past year without also having a past-year heroin use disorder; and heroin use disorder (HUD) defined as having a past-year heroin use disorder with or without also having a past-year prescription opioid use disorder. Past-month nicotine dependence is based on the Nicotine Dependence Syndrome Scale.

Any mental illness (AMI) is defined as currently or at any time in the past year having had a diagnosable mental disorder (excluding developmental disorders and substance use disorders) of sufficient duration to meet DSM-IV diagnostic criteria. Serious mental illness (SMI) is defined as currently or at any time in the past year having had a mental disorder (excluding developmental disorders and substance use disorders) of sufficient duration to meet DSM-IV diagnostic criteria, that resulted in serious functional impairment substantially interfering with or limiting one or more major life activities. To generate estimates of AMI and SMI, SAMHSA and the National Institute of Mental Health implemented the Mental Health Surveillance Study (MHSS). In the MHSS, 5700 NSDUH sampled adults participated in a follow-up telephone clinical interview by a trained mental health clinician using an adapted Structured Clinical Interview for DSM-IV-TR Axis I Disorders, including mood disorders (e.g., major depressive episode, manic episode); anxiety disorders (e.g., panic disorder, generalized anxiety disorder, posttraumatic stress disorder); eating disorders (e.g., anorexia nervosa); intermittent explosive disorder; and adjustment disorder. In addition, the presence of psychotic symptoms was assessed through the use of a standardized psychosis screener. Using the data collected by the MHSS, a statistical model was developed to predict SMI based on questions on psychological distress (past-year K6 scale), impairment (truncated version of the World Health Organization Disability Assessment Schedule), serious suicidal ideation, major depressive episode, and age. Using this prediction model, past-year SMI status (yes/no) is determined for each respondent in the NSDUH adult samples (Substance Abuse and Mental Health Services Administration, 2018).

NSDUH respondents also are asked a series of questions about receipt of substance use and mental health treatment services in the past year and in their lifetime. Finally, demographic data, including age, gender, race/ethnicity, annual household income, type of county of residence, and insurance status are collected for all NSDUH respondents.

2.3. Data analysis

Using combined 2015–2017 NSDUH public-use-file data, we estimated prevalence of past-year substance use disorders overall and specifically for alcohol, cannabis, cocaine, methamphetamine, and sedatives/tranquilizers, past-month nicotine dependence, and past-year AMI and SMI among adults aged 18–64 years with a past-year OUD (n = 1500), among adults with RxOUD (n = 1000), and among adults with HUD (n = 500). In addition, we estimated prevalence of receiving substance use disorder treatment services in the past year among adults with a past-year OUD; prevalence of receiving mental health treatment services in the past year among adults with a past-year OUD and past-year AMI or SMI; and prevalence of receiving both substance use disorder treatment services and mental health treatment services in the past year among adults with past-year OUD and past-year AMI or SMI. Results are presented as percentages and associated 95% confidence intervals.

Multivariable logistic regression models were fit to assess demographic and substance use characteristics associated with past-year AMI and SMI among adults with OUD as well as receipt of substance use disorder treatment services among adults with OUD, receipt of mental health treatment among adults with OUD and AMI, and receipt of mental health treatment among adults with OUD and SMI. Results are presented as adjusted odds ratios (aORs) and associated 95% confidence intervals. Stata v15.1 was used to account for the NSDUH complex survey design and sample weights.

3. Results

In 2015–2017, 1.1% (95% CI:1.0%–1.1%) or approximately 2,083,400 Americans aged 18–64 had a past-year OUD; 0.7% (95% CI:0.7%–0.8%) had a RxOUD; and 0.3% (95% CI:0.3%-0.4%) had a HUD. Among adults with past-year OUD, 60.7% (95% CI:57.1%–64.2%) were male, 20.8% (95% CI:18.4%–23.3%) were aged 18–25, 29.1% (95% CI:25.5%–33.0%) were aged 26–34 years, 50.1% (95% CI:46.4%–53.8%) were aged 35 or older, 74.3% (95% CI:67.9%-77.3%) were non-Hispanic white. 10.6% (95% CI:8.3%–13.5%) were non-Hispanic black, and 9.8% (95% CI: 7.7–12.5%) were Hispanic.

3.1. Prevalence of past-year co-occurring substance use and mental disorders

Any past-year co-occurring substance use disorder or nicotine dependence was found among 77.2% (95% CI:67.7%–76.3%) of those with OUD, 67.6% (95% CI: 62.2%–72.6%) of those with RxOUD, and 82.7% (95% CI:77.0%–87.2%) of those with HUD (Fig. 1). Past-month nicotine dependence was reported among 48.6% (95% CI:43.8%–53.5%) of adults with past-year OUD, 41.7% (95% CI:36.1–47.5% of adults with RxOUD, and 64.4% (95% CI:58.6%–69.8%) of adults with HUD. Prevalence of specific co-occurring past-year substance use disorders was: alcohol use disorder, 26.4% (95% CI:23.6% = 29.4%) for adults with OUD, 29.0% (95% CI:25.3%–33.0%) for adults with RxOUD, 20.5% (95% CI:15.9%–26.0%) for adults with HUD; cannabis use disorder, 15.9% (95% CI:13.2%–19.0%) for OUD, 16.4% (95% CI:13.0%–20.6%) for RxOUD, 14.7% (95% CI:11.2%–19.0%); cocaine use disorder, 12.5% (95% CI:9.9%–15.6%) for OUD, 8.2% (95% CI:5.8%–11.5%) for RxOUD, 22.2% (16.8%–28.8%) for HUD; methamphetamine use disorder, 10.6% (95% CI:8.6%–13.0%) for OUD, 6.6% (95% CI:4.6%–9.3%) for RxOUD, 19.8% (95% CI:15.8%–24.4%) for HUD; and sedative/tranquilizer use disorder, 15.6% (95% CI:13.6%–17.9%) for OUD, 16.3% (95% CI:13.9%–19.0%) for RxOUD, 13.9% (10.6%–18.0%) for HUD.

Mental illness was common among adults with OUD, with 64.3% (95% CI:60.4%–67.9%) having AMI in the past year and 26.9% (95% CI:24.2%–29.8%) having SMI in the past year. Prevalence for co-occurring AMI and SMI were similar for RxOUD and HUD.

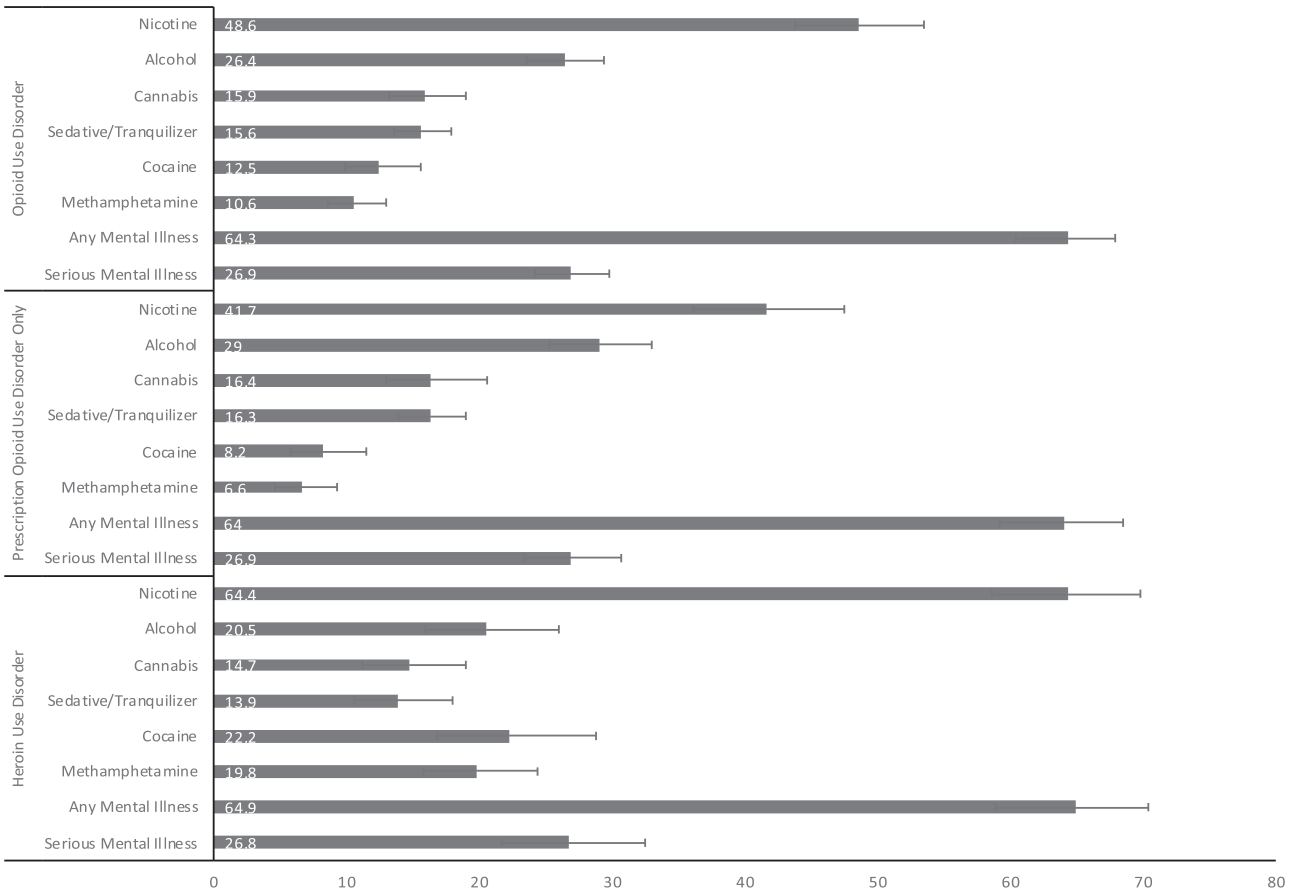

Fig. 1. Opioid Use Disorders.

3.2. Prevalence of receiving substance use disorder and mental health treatment services in the past year

Receipt of substance use disorder treatment services in the past year was reported by 34.5% (95% CI:31.2%–37.9%) of adults with OUD, 38.4% (95% CI:34.1%–42.9%) for adults with OUD and AMI, and 38.2% (95% CI:31.1%–45.8%) for adults with OUD and SMI. Receipt of mental health treatment services in the past year was reported by 54.7% (95% CI:50.4%–58.9%) of those with OUD and AMI and by 64.6% (95% CI:57.0%–71.6%) of those with OUD and SMI. Receiving both mental health and substance use disorder treatment services in the past year was reported by 24.5% (95% CI:21.5%–29.9%) of those with OUD and AMI and by 29.6% (95% CI:23.3%–36.7%) of those with OUD and SMI.

3.3. Multivariable logistic regression models – any mental illness

In the multivariable logistic regression models, characteristics associated with lower odds of past-year AMI among adults with OUD included male sex (aOR = 0.39, 95% CI:0.26–0.57) and Hispanic race/ethnicity compared to non-Hispanic white (aOR = 0.51, 95% CI:0.30–0.86) (Table 1). Characteristics associated with increased odds of past-year AMI among adults with OUD included, having a past-year cannabis use disorder (aOR = 2.00, 95% CI:1.24–3.22) or past-year cocaine use disorder (aOR = 1.89, 95% CI:1.10–3.26), and receiving any mental health treatment services in the past year (aOR = 2.90, 95% CI:1.99–4.23). Receipt of substance use disorder treatment services in the past year was not associated with past-year AMI (aOR = 1.29, 95% CI:0.86–1.95) among adults with OUD.

3.4. Multivariable logistic regression models – serious mental illness

Male sex was associated with lower odds of having past-year SMI (aOR = 0.47, 95% CI:0.32–0.69) among adults with OUD. Having a past-year alcohol use disorder (aOR = 1.51 (95% CI:1.00–2.28) or a past-year cannabis use disorder (aOR = 1.78, 95% CI:1.13–2.79), and receiving any mental health treatment services in the past year (aOR = 2.71, 95% CI:1.79–4.10). Receipt of substance use disorder treatment services in the past year was not associated with past-year SMI (aOR = 1.01, 95% CI:0.64–1.58) among adults with OUD.

3.5. Multivariable logistic regression models – receipt of mental health treatment in past year among adults with OUD and AMI

Among adults with OUD and AMI, characteristics associated with lower odds of receiving mental health treatment services in the past year included male sex (aOR = 0.48, 95% CI:0.33–0.69), age 18–25 years compared to 35 years or older (aOR = 0.58, 95% CI:0.37–0.93), Non-Hispanic black (aOR = 0.31, 95% CI:0.13–0.73) or Non-Hispanic other (aOR = 0.36, 95% CI:0.14–0.95) compared to Non-Hispanic white, and being uninsured compared to having private or other insurance (aOR = 0.42, 95% CI:0.24–0.75). Having a past-year sedative/tranquilizer use disorder was associated with increased odds of receiving mental health treatment services in the past year (aOR = 1.79, 95% CI:1.04–3.09).

3.6. Multivariable logistic regression models – receipt of mental health treatment in past year among adults with OUD and SMI

Among adults with OUD and SMI, characteristics associated with lower odds of receiving mental health treatment services in the past

Table 1
Multivariable logistic regression models examining correlates of any mental illness and serious mental illness among adults with opioid use disorder and receipt of substance use disorder and mental health treatment services, united states, 2015–2017.

	Past Year Any Mental Illness Among Adults with OUD aOR (95% CI)	Past Year Serious Mental Illness Among Adults with OUD aOR (95% CI)	Past Year Mental Health Treatment Among Adults with OUD and AMI aOR (95% CI)	Past Year Mental Health Treatment Among Adults with OUD and SMI aOR (95% CI)	Past Year Substance Abuse Treatment Among Adults with OUD aOR (95% CI)
Sex					
Female	Ref	Ref	Ref	Ref	Ref
Male	**0.39 (0.26–0.57)**	**0.47 (0.32–0.69)**	**0.48 (0.33–0.69)**	**0.43 (0.23–0.80)**	1.09 (0.83–1.44)
Age					
18–25 years	0.68 (0.43–1.03)	0.92 (0.60–1.40)	**0.58 (0.37–0.93)**	0.59 (0.30–1.13)	1.19 (0.78–1.81)
26–34 years	0.92 (0.64–1.31)	0.82 (0.54–1.23)	0.69 (0.42–1.11)	1.06 (0.50–2.23)	1.38 (0.97-1.99)
35 years or older	Ref	Ref	Ref	Ref	Ref
Race/ethnicity					
Non-Hispanic white	Ref	Ref	Ref	Ref	Ref
Non-Hispanic black	0.68 (0.41–1.11)	0.58 (0.32–1.05)	**0.31 (0.13–0.73)**	**0.14 (0.04–0.55)**	**0.43 (0.23–0.82)**
Non-Hispanic Other	1.24 (0.46–3.31)	1.04 (0.38–2.86)	**0.36 (0.14–0.95)**	0.20 (0.04–1.06)	**0.40 (0.17–0.97)**
Non-Hispanic > 1 Race	1.57 (0.80–3.08)	1.92 (0.81–4.54)	1.88 (0.86–4.09)	1.64 (0.46–5.82)	0.65 (0.32–1.31)
Hispanic	**0.51 (0.30–0.86)**	0.62 (0.36–1.06)	0.80 (0.35–1.86)	0.97 (0.31–3.02)	0.73 (0.42–1.25)
Annual household income					
Less than $20,000	0.99 (0.66–1.49)	1.10 (0.64–1.88)	1.28 (0.72–2.29)	0.57 (0.20–1.63)	1.39 (0.90–2.15)
$20,000–$49,999	1.26 (0.76–2.08)	1.04 (0.65–1.68)	0.61 (0.35–1.06)	**0.25 (0.10–0.60)**	0.86 (0.52–1.41)
$50,000–$74,999	0.85 (0.47–1.56)	1.16 (0.57–2.36)	0.66 (0.40–1.10)	**0.36 (0.13–0.97)**	0.97 (0.65–1.45)
$75,000 or more	Ref	Ref	Ref	Ref	Ref
County of residence					
Large metro	Ref	Ref	Ref	Ref	Ref
Small metro	0.83 (0.54–1.27)	0.99 (0.66–1.47)	0.80 (0.56–1.15)	0.69 (0.34–1.41)	0.98 (0.68–1.41)
Nonmetro	0.96 (0.60–1.54)	0.86 (0.53–1.39)	0.96 (0.62–1.49)	1.76 (0.80–3.89)	0.82 (0.56-1.19)
Insurance status					
Private or other	Ref	Ref	Ref	Ref	Ref
Medicaid	1.13 (0.79–1.62)	0.88 (0.56–1.38)	1.08 (0.67–1.72)	1.22 (0.46–3.22)	**2.26 (1.53–3.33)**
Uninsured	1.18 (0.68–2.04)	1.62 (0.94–2.78)	**0.42 (0.24–0.75)**	**0.29 (0.12–0.72)**	0.76 (0.44–1.30)
Substance Use Disorder					
Nicotine dependence	0.85 (0.62–1.18)	0.88 (0.56–1.38)	0.66 (0.43–1.01)	0.58 (0.30–1.13)	**1.75 (1.29–2.36)**
Alcohol	1.29 (0.88–1.89)	**1.51 (1.00–2.28)**	0.86 (0.56–1.33)	0.91 (0.44–1.88)	0.90 (0.60–1.36)
Cannabis	**2.00 (1.24–3.22)**	**1.78 (1.13–2.79)**	1.00 (0.65–1.52)	1.12 (0.51–2.44)	0.66 (0.43–1.01)
Cocaine	**1.89 (1.10–3.26)**	1.03 (0.56–1.92)	1.40 (0.75–2.62)	0.86 (0.34–2.18)	**1.78 (1.10–2.88)**
Methamphetamine	1.44 (0.84–2.45)	1.37 (0.78–2.41)	0.86 (0.47–1.59)	0.62 (0.24–1.57)	1.44 (0.85–2.43)
Sedative/tranquilizer	1.14 (0.65–2.02)	1.50 (0.98–2.29)	**1.79 (1.04–3.09)**	2.09 (0.99–4.40)	**1.63 (1.02–2.61)**
Service Receipt					
Mental health treatment	**2.90 (1.99–4.23)**	**2.71 (1.79–4.10)**	–	–	–
Substance use treatment	1.29 (0.86–1.95)	1.01 (0.64–1.58)	–	–	–

aOR = adjusted odds ratio.
Non-Hispanic Other includes non-Hispanic American Indian/Alaska Natives, non-Hispanic Native Hawaiians or other Pacific Islanders, and non-Hispanic Asians.
Bold font indicates statistically significant finding at $p < 0.05$.

year included male sex (aOR = 0.43, 95% CI:0.23–0.80), non-Hispanic black (aOR = 0.14, 95% CI:0.04–0.55) compared to non-Hispanic white, annual household income between $20,000–$49,999 (aOR = 0.25 95% CI:0.10–0.60) or between $50,000–$74,999 (aOR = 0.36, 95% CI:0.13–0.97) compared to $75,000 or more, and being uninsured compared to having private or other insurance (aOR = 0.29, 95% CI:0.12–0.72).

3.7. Multivariable logistic regression models – receipt of substance use disorder treatment services in past year among adults with OUD

The odds of receiving substance use disorder treatment services in the past year were lower among non-Hispanic blacks (aOR = 0.43, 95% CI:0.23–0.82) and non-Hispanic other (aOR = 0.40, 95% CI:0.17–0.97) compared to non-Hispanic whites. Having Medicaid compared to private or other insurance was associated with increased odds of receiving substance use disorder treatment services in the past year (aOR = 2.26, 95% CI:1.53–3.33) as was having past-month nicotine dependence (aOR = 1.75, 95% CI:1.29–2.36), a past-year cocaine use disorder (aOR = 1.78, 95% CI:1.10–288), or a past-year sedative/tranquilizer use disorder (aOR = 1.63, 95% CI:1.02–2.61).

4. Discussion

Co-occurring substance use and mental disorders were common among the more than 2 million U.S. adults with a past-year OUD in 2015–2017. In fact, nearly 75% had a past-year co-occurring substance use disorder or nicotine dependence with 1 in 4 having an alcohol use disorder, 1 in 6 having a use disorder related to cannabis or sedatives/tranquilizers, 1 in 8 having a cocaine use disorder, and 1 in 10 having a methamphetamine use disorder. Of particular concern was the high prevalence of mental illness among people with OUD, including 1 in 4 adults with OUD having co-occurring SMI in the past year.

The low substance use disorder and mental health treatment rates seen among this high-risk population are concerning. Approximately one-third of adults with OUD received any substance use disorder treatment services in the past year. Moreover, a large minority of those with OUD and AMI or OUD and SMI did not receive any mental health treatment services in the past year and far fewer received both mental health and substance use disorder treatment services.

Our findings highlight the clinical complexity of patients with OUD and that the gap between need for and receipt of treatment services continues to persist in the U.S., especially for those with co-occurring OUD and mental illness. They also underscore the importance of ensuring that current efforts to expand the availability of medication-assisted treatment for OUD incorporate a continuum of treatment and

recovery support services to address the co-occurring mental and substance use disorders in this population. Finally, our results highlight the often missed opportunity to provide substance use disorder treatment while individuals are receiving mental health treatment. Innovative service delivery models such as the Hub-and-Spoke model and Certified Community Behavioral Health Clinics that provide integrated medical and psychiatric care and clinical stabilization followed by direct ongoing care or referral to a primary care provider are promising approaches to providing such comprehensive services to individuals with opioid use disorder (Brooklyn and Sigmon, 2017; The National Council, 2017).

This expansion of comprehensive service delivery models should be pursued in tandem with provider training and education on addiction and mental health. Provider education in the management of addiction is inadequate and low confidence in addressing opioid use disorder is a commonly identified barrier to providing care for patients with opioid use disorder (Cunningham et al., 2006; Kissin et al., 2006; Netherland et al., 2009; Jones and McCance-Katz, 2018). Equally important are implementing initiatives to educate the public and patients about addiction and mental health. These initiatives should include strategies to counter stigma and to educate individuals about effective, high-quality treatment and how to access treatment.

4.1. Limitations

This study is subject to limitations. NSDUH is based on self-report and subject to recall and social desirability bias, over or under-reporting may occur. In addition, NSDUH data are cross-sectional; thus, causal relationships could not be established. Finally, NSDUH includes noninstitutionalized civilians, a small proportion of the U.S. population such as active duty military personnel, homeless individuals not living in shelters, and incarcerated populations are excluded. Thus, our estimates of prevalence may be underestimates because populations such as homeless adults not living in shelters and adults in the criminal justice system usually have higher prevalence of substance use and mental disorders compared to the general civilian noninstitutionalized population.

4.2. Conclusions

Among adults with opioid use disorder, co-occurring substance use and mental disorders are common. Efforts to expand access to comprehensive service delivery models that can address the substance use, mental health, and physical health co-morbidities of this population are urgently needed.

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Nothing declared.

Contributors

CMJ and EMK conceived the study. CMJ outlined the manuscript, acquired the data, conducted the analyses, and wrote the first draft of the manuscript. EMK critically reviewed and provided edits on the manuscript. CMJ was responsible for submission of the manuscript to the journal. All authors read and approved final manuscript.

Conflict of interest

No conflict declared.

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