Published in final edited form as:

Addict Res Theory. 2020 ; 28(2): 165–172. doi:10.1080/16066359.2019.1613524.

The Prevalence of Substance Use Disorders among Community-based Adults with Legal Problems in the U.S

Kelly E. Moore, PhD^{1,*}, Lindsay Oberleitner, PhD², Brian P. Pittman, MS², Walter Roberts, PhD², Terril L. Verplaetse, PhD², Robyn L. Hacker, PhD³, MacKenzie R. Peltier, PhD², Sherry A. McKee, PhD²

¹East Tennessee State University, Department of Psychology, 420 Rogers-Stout Hall, P.O. Box 70649, Johnson City, TN 37614

²Yale University School of Medicine, Department of Psychiatry, 2 Church Street South, Suite 109, New Haven, CT 06519

³Center for Dependency, Addiction, and Rehabilitation, University of Colorado Boulder, 1693 N. Quentin St., Aurora, CO 80045

Abstract

Background: Current national prevalence estimates of DSM-5 diagnosed substance use disorders (SUDs) among adults with justice system involvement are lacking.

Methods.—This study drew from NESARC-III data ($n = 36,309$; 2012–2013), a nationally representative U.S. sample, to examine current and lifetime alcohol use disorder (AUD) and drug use disorder (DUD) diagnoses among adults reporting current or prior drug-related, alcohol-related, and general legal problems.

Results: Adults reporting current alcohol-related legal problems were 22 times more likely to have a current AUD diagnosis (AOR = 22.0, 95% CI = 12.1; 40.1) and 15 times more likely to have had a lifetime AUD diagnosis (AOR = 15.2, 95% CI = 7.5; 30.9) than adults without alcohol-related legal problems. Adults with lifetime drug-related legal problems were 3–5 times more likely to have a current (AOR = 2.6, 95% CI = 2.1; 3.2) and lifetime (AOR = 5.1, 95% CI = 4.3; 6.1) DUD diagnosis, with stimulant use disorder being the most prevalent (AOR = 5.4, 95% CI = 4.5; 6.5). Adults with general legal problems were around 3 times more likely to have a current

*Correspondence concerning this article should be addressed to Kelly E. Moore [Address: East Tennessee State University Department of Psychology, 420 Rogers-Stout Hall P.O. Box 70649 Johnson City, TN 37614; mooreke2@etsu.edu; Office: 423-439-4849].

Disclosures of Interest

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 the intramural program, NIAAA, NIH. This work was supported by funding from NIDA T32DA019426–12 (KEM). The work described in this article does not express the views of NIH. The views and opinions expressed are those of the authors. Sponsors and funders of the NESARC-III, and specific funders of this study, had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and the decision to submit the manuscript for publication. The authors report no conflicts of interest. The data that support the findings of this study are available with permission from NIAAA at <https://www.niaaa.nih.gov/research/nescarc-iii>.

Conflicts of Interest

The authors report no conflicts of interest.

AUD (AOR = 3.2, 95% CI = 2.6; 4.0) or DUD (AOR = 3.5, 95% CI = 2.8; 4.4). Women with any type of legal problem were more likely to have SUD diagnoses than men.

Conclusions: SUD diagnoses are prevalent among adults reporting legal problems, particularly those involving alcohol. There is a continued need for community-based addiction prevention and intervention efforts, especially for women with justice system involvement.

Keywords

legal problems; alcohol use disorder; drug use disorder; substance use disorder; epidemiology; criminal justice system

Introduction

The U.S. has the highest rate of incarceration in the world, with about 1% of U.S. adults incarcerated at any given time (Blumstein, 2011), and almost 12 million people cycling through the criminal justice system each year (Minton, 2012). A large proportion of individuals who come in contact with the criminal justice system engage in problematic substance use. People often violate the law while under the influence of substances (e.g., driving while intoxicated, assault, disorderly conduct) or engage in illegal behaviors (e.g., theft, fraud, distribution) to buy substances or replace money spent on substances (Bureau of Justice Statistics, 2013). In addition to substance-related crime, people who use substances are often involved in high-risk environments wherein crime is common, and commit crimes that are not necessarily related to their use (Bureau of Justice Statistics, 2013). While research consistently demonstrates a high prevalence of substance use disorders (SUDs) among arrestees and incarcerated populations (Bronson et al., 2017), there is far less research on the prevalence of SUDs (in particular, Diagnostic and Statistical Manual of Mental Disorders-5 [DSM-5] diagnosed SUDs) among community-based men and women who have had contact with the criminal justice system. Further, research on the prevalence of SUDs rarely distinguishes between people with criminal involvement that was and was not prompted by substance use. There is a need for current national estimates of SUDs among U.S. adults with substance- and non-substance-related criminal involvement to inform community-based addiction prevention and intervention efforts.

SUDs are highly prevalent among people currently involved in the criminal justice system. Between 42% to 58% of incarcerated individuals report having used drugs or alcohol (or been in withdrawal) at the time of their arrest (Bronson et al., 2017; Kouri et al., 1997) and 66% of arrestees test positive for drugs upon incarceration (Peters, Kremling, & Hunt, 2015). National studies show that between 58% and 68% of U.S. adults incarcerated in jail or prison (regardless of index offense) meet criteria for SUDs (Bronson et al., 2017; James & Glaze, 2005). When broken down by type of substance, 53% of incarcerated individuals with SUDs have drug use disorders (DUDs) and 47% have alcohol use disorders (AUDs; James & Glaze, 2005), and among people on probation or parole, 42% have DUDs and 34% have AUDs (Feucht & Gfroerer, 2011). Many people who come in contact with the criminal justice system are only briefly incarcerated (if at all), highlighting the need to examine the prevalence of SUDs among community-based in addition to incarcerated populations. Research examining the prevalence of SUDs among community-based populations with

criminal involvement is limited; two national studies show that people with a lifetime history of being arrested have increased risk of current cannabis use disorder (Wu et al., 2014) and heroin use (Ihongbe & Masho, 2016).

There is little research available on the prevalence of SUDs among community-based individuals who engage in substance-related crime, as studies rarely assess legal problems specifically related to alcohol or drug use. National studies of incarcerated samples show that 67% to 74% of prison and jail inmates incarcerated for drug offenses (e.g., possession, distribution) meet criteria for SUDs (Bronson et al., 2017). Among community-based samples, the majority of studies have focused on the presence of AUD among individuals who engage in alcohol-related offenses. Studies show that 11% of people who report driving under the influence meet criteria for alcohol dependence and 19% meet criteria for alcohol abuse (Caetano & McGrath, 2005). In addition, 13% of people who received a driving while intoxicated (DWI) conviction in their lifetime continued to meet criteria for an AUD 15 years later (Lapham et al., 2011). Though people with DUDs often report legal problems (Palmar et al., 2015; Tarter et al., 2011), there is limited information available about the prevalence of DUDs and specific DUDs among community-based populations with drug-related criminal involvement.

Present Study

Population-based research on the current prevalence of DSM-5-diagnosed SUDs among community-based adults with substance- and non-substance-related legal problems is needed. This study used data from the National Epidemiologic Survey on Alcohol and Related Conditions Wave III (NESARC-III) to examine the lifetime and current presence of AUDs and DUDs (as well as specific DUDs) among non-institutionalized U.S. adults with three types of current or prior legal problems—alcohol-related, drug-related, and those not necessarily related to substance use. To further explore the association between legal problems and DSM-5 SUD diagnoses, supplementary analyses examined gender differences in these relationships.

Methods

Participants and Procedures

Data for this study were drawn from the NESARC-III, a survey conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) from April 2012 to June 2013 (for more information on methods, see Grant et al., 2014). Original data collection and secondary analysis of data were approved by the institutional review board. The sample consisted of 36,309 non-institutionalized U.S. adult men and women whose addresses were randomly selected from the 2010 census via probability sampling of counties in 50 states. Trained interviewers initiated contact with individuals living at the selected addresses, screened and randomly selected an eligible respondent (i.e., household member at least 18 years old), and obtained informed consent. Individuals who agreed to participate completed an in-person computer-assisted interview (Alcohol Use Disorder and Associated Disabilities Interview Schedule-5; AUDADIS-5), which is found to be a reliable and valid measure of DSM-5 criteria used to diagnose SUDs (Hasin et al., 2015). Participants were paid \$45 before and

after completing the AUDADIS-5. Data were weighted to adjust for oversampling racial/ethnic minorities and nonresponse. Sample demographics are displayed in Table 1. Supplemental tables 1a–1b show sample demographics by alcohol-related, drug-related, and general legal problems.

Measures

Legal Problems—Three types of legal problems were assessed. If participants endorsed ever having used alcohol they were asked, “*Did you ever get arrested, held at a police station, or have other legal problems because of drinking in the last 12 months? Prior to the last 12 months?*” Possible responses were yes, no, or unknown. “Unknown” responses for the past 12 months ($n = 18$) and prior to the past 12 months ($n = 21$) were recoded as missing, and two dichotomous variables were created capturing current (i.e., past 12 months, $n = 31,139$) and lifetime (i.e., prior to the past 12 months, $n = 31,736$) alcohol-related legal problems. Regarding drug use, participants were instructed to think about “*experiences with medicines and other kinds of drugs that you may have used on your own - that is, either without a doctor’s prescription; in greater amounts, more often, or longer than prescribed; or for a reason other than a doctor said you should use them.*” If participants reported ever having used drugs in their lifetime or in the past 12 months, they were asked, “*In the last 12 months, did you more than once get arrested, held at a police station or have any other legal problems because of your medicine or drug use?*” *Did this happen before 12 months ago?*” Possible responses were yes, no, or unknown. “Unknown” responses for the past 12 months ($n = 17$) and prior to the past 12 months ($n = 92$) were recoded as missing, and two dichotomous variables were created capturing current (i.e., past 12 months, $n = 5,107$) and lifetime (i.e., prior to the past 12 months, $n = 12,742$) drug-related legal problems. Current general legal problems were assessed by asking all participants ($n = 36,309$), “*Did you have serious trouble with the police or law [in the past 12 months]?*” “Unknown” responses ($n = 11$) were coded as missing. One dichotomous variable for current general legal problems was created ($n = 36,298$). Data on lifetime history of general legal problems were not available.

SUD Diagnosis—DSM-5 criteria for the presence of AUDs and DUDs in the past 12 months (current) and prior to the past 12 months (lifetime) were assessed with the AUDADIS-5. Current and lifetime variables were created to reflect the presence of any DUD (marijuana, cocaine, opiates, heroin, sedatives, stimulants, hallucinogens, inhalants/solvents, club drugs, or other drugs). We then created variables to examine lifetime presence of specific DUDs, including marijuana, opioid (i.e., heroin or other opiates), stimulant (i.e., cocaine or other stimulants), and other drugs (i.e., sedatives, hallucinogens, inhalants/solvents, club drugs, or other drugs). Sample sizes were too low to examine current presence of specific DUDs.

Covariates—Because research has shown that individuals who are younger, unmarried, of certain ethnicities, male, less educated, or who have lower income or a psychiatric condition have higher risk of substance use problems and/or justice system involvement (Fearn et al., 2016; authors et al., in press), we controlled for these variables in all analyses. We also controlled for region and urbanicity, as is standard in population-based research (i.e., Chou

et al., 2016). Presence of a psychiatric disorder was coded as meeting DSM-5 criteria for any of the following: major depression, persistent depression, bipolar I, generalized anxiety, social anxiety, specific phobia, panic disorder, agoraphobia, anorexia nervosa, bulimia, binge eating disorder, posttraumatic stress disorder. In addition, participants were coded as having a psychiatric disorder if they endorsed that a doctor or other health professional ever diagnosed them with schizophrenia/ psychotic episode.

Analysis Plan

Data were analyzed using PROC SURVEYLOGISTIC in SAS, version 9.4 (Cary, NC). This procedure allowed for incorporating the stratification, clustering (i.e., primary sampling unit [PSU]), and unequal weighting of the sampling design. A series of logistic regressions were used to examine the risk of having a lifetime or current AUD and DUD diagnosis among people with each type of legal problem (i.e., lifetime or current drug-related, lifetime or current alcohol-related, current general). Only the *lifetime* risk of specific DUDs was examined (i.e., marijuana, opioid, stimulant, or other drug use disorder) due to low sample size within classes of current DUDs. Supplementary analysis of gender differences in the relationship between legal problems and SUD diagnoses was conducted by running the primary logistic regressions stratified by gender as well as including gender by legal problem interactions. All analyses included the above described covariate set.

Results

Among those who reported using alcohol/drugs, a lifetime history of alcohol-related legal problems (9.9%) was more common than a lifetime history of drug-related legal problems (6.9%; see Table 1); however, current drug-related legal problems (2.7%) were more common than current alcohol-related legal problems (0.8%). About 2% of the full sample reported current general legal problems. Almost a third of U.S. adults met criteria for a lifetime history of AUD (27.5%) and 14.1% met criteria for a current AUD. Lifetime presence of DUD was 9.8% and current presence of DUD was 4.1%.

AUD Diagnosis

Table 2 shows the risk of AUD diagnosis among U.S. adults with alcohol-related and general legal problems. Among adults who drank alcohol, those with current alcohol-related legal problems had greatly increased odds of both current and lifetime AUD diagnoses; 88% met criteria for a current AUD (AOR = 22.0, 95% CI = 12.1; 40.1) and 91% met criteria for a lifetime AUD (AOR = 15.2, 95% CI = 7.5; 30.9), compared to 16% (current AUD) and 30% (lifetime AUD) among adults who drank but did not have current alcohol-related legal problems. Among adults who drank and had a lifetime history of alcohol-related legal problems, 73% met criteria for a lifetime AUD and 39% met criteria for a current AUD, compared to 27% and 14%, respectively, of adults who drank but did not have a lifetime history of alcohol-related legal problems. Adults with current general legal problems (not necessarily related to substance use) were about 3 times as likely as adults without legal problems to meet criteria for current and lifetime AUD.

Because of the potential overlap of alcohol-related legal problems and AUD criteria focused on illegal activity, we conducted an analysis removing adults who endorsed driving while intoxicated, having been in a vehicle accident while intoxicated, or driving after having too much to drink in their lifetime ($n = 7,039$) and in the past year ($n = 1,955$) from the respective lifetime and current AUD diagnosis variables (see Table 3). When excluding adults who endorsed any of these illegal alcohol-related behaviors from the AUD diagnosis variables, adults who drank alcohol and reported current and lifetime alcohol-related legal problems, as well as adults with current general legal problems, continued to have increased, albeit smaller, risk of current and lifetime AUD diagnosis. Among adults who drank and reported current alcohol-related legal problems, 68% had a current AUD diagnosis (AOR = 9.3, 95% CI = 4.4; 19.5) and 53% had a lifetime AUD diagnosis (AOR = 3.7, 95% CI = 1.4; 9.4) compared to 11% and 12% of adults who drank but denied alcohol-related legal problems. Among adults who drank and had a lifetime history of alcohol-related legal problems, 25% had a current AUD diagnosis (AOR = 2.8, 95% CI = 2.4; 3.2) and 18% had a lifetime AUD diagnosis (AOR = 1.3, 95% CI = 1.0; 1.6) compared to 9% and 12% of those who drank but denied a lifetime history of alcohol-related legal problems. Adults with general legal problems were twice as likely to have a current or lifetime AUD diagnosis compared to adults without legal problems.

DUD Diagnosis

Table 4 shows the presence of DUD diagnosis among adults with drug-related and general legal problems. Adults with a lifetime history of drug-related legal problems had the highest prevalence of a lifetime DUD diagnosis: among adults who used drugs and reported a lifetime history of drug-related legal problems, 68% had a lifetime history of DUD (AOR = 5.1, 95% CI = 4.3; 6.1) compared to only 25% of adults who used drugs but denied a history of drug-related legal problems. Among adults who used drugs, those with current drug-related legal problems were around 3 times as likely to have current and lifetime DUD diagnoses compared to adults who used drugs but denied current drug-related legal problems. Among adults with current general legal problems (not necessarily related to substance use), 24% met current criteria for a DUD whereas only 4% of adults without general legal problems met criteria for a current DUD (AOR = 3.5, 95% CI = 2.8; 4.4).

Specific DUDs

Table 5 shows the lifetime presence of marijuana, opioid, stimulant, and other drug use disorder diagnoses among adults with drug-related and general legal problems. Adults with current drug-related or general legal problems were 2–3 times more likely to have marijuana, opioid, stimulant, or other drug use disorders compared to adults who denied legal problems. Adults with a lifetime history of drug-related legal problems were most likely to have had a lifetime stimulant use disorder (AOR = 5.4, 95% CI = 4.5; 6.5) followed by opioid use (AOR = 4.1, 95% CI = 3.3; 5.1), other drug use (AOR = 3.3, 95% CI = 2.4; 4.6), and marijuana use (AOR = 2.4; 95% CI = 2.0; 2.9) disorders.

Gender Differences

Primary analyses stratified by gender are displayed in Supplemental Tables 2a–d. Interaction analyses showed that men with current alcohol-related legal problems were less likely to

have a current AUD diagnosis than women (AOR = 0.3; 95% CI = -2.2; -0.2, $p=.024$). Men with a lifetime history of alcohol-related legal problems were also less likely to have had a lifetime AUD diagnosis than women (AOR = 0.5; 95% CI = -0.9; -0.4, $p<.001$). Regarding DUDs, men with a lifetime history of drug-related legal problems were less likely to have had a lifetime DUD diagnosis than women (AOR = 0.4; 95% CI = -1.3; -0.4, $p<.001$). Men with current general legal problems were less likely than women to have had a lifetime (AOR = 0.6; 95% CI = -1.0; -0.2, $p=.007$) or current (AOR = 0.5; 95% CI = -1.1; -0.2, $p=.007$) DUD diagnosis.

Unadjusted Analyses

Analyses examining the unadjusted relationship of legal problems with AUD, DUD, and specific DUD diagnoses are presented in supplemental tables 3a-d. Controlling for sociodemographic variables only slightly decreased effect sizes.

Discussion

This population-based study presents 2012–2013 data on DSM-5 diagnosed alcohol and drug use disorders among U.S. adults with current or prior substance- and non-substance-related criminal involvement. In general, U.S. adults reporting a current or past history of legal problems (for both substance- and non-substance-related reasons) have high rates of AUDs and DUDs. People who reported general or drug-related legal problems were 3–5 times more likely to have a current DUD diagnosis compared to people without such legal problems. Adults with all three types of legal problems had a high prevalence of stimulant use disorder, which is consistent with research suggesting a connection between cocaine/other stimulant use and crime (Gillespie et al., 2007; Nyamathi et al., 2013) as well as heightened prevalence of cocaine (Proctor & Hoffman, 2012) and stimulant use disorder among incarcerated populations (Proctor, 2012).

Regarding AUDs, the presence of AUDs were increased by over 22 times among people who drank and had current alcohol-related legal problems, compared to those who drank but had no such legal problems. Alcohol possession and use are not inherently illegal, and thus alcohol-related charges may represent severe impairment and reckless behavior while intoxicated. This is consistent with research showing high prevalence of AUDs among people with DWI charges (Lapham et al., 2011). Our results also suggest that people with alcohol-related legal problems are likely to have AUD diagnosis even when excluding those individuals who drive while intoxicated. This suggests that other maladaptive alcohol-related behaviors that prompt crime (e.g., assault, disorderly conduct) may be important markers of disordered alcohol use.

The treatment of AUD among people in the justice system is especially important to consider with the removal of legal problems as one of the criteria used to diagnose disordered substance use in DSM-5. For instance, one study found that people with initial DWI offenses met criteria for substance abuse using DSM-IV-TR criteria but were no longer diagnosed with an AUD using DSM-5 criteria (Baley & Hoffman, 2015). Despite research consistently showing that AUD is highly prevalent among people involved in the criminal justice system, people arrested for DWI are often incarcerated for brief periods and/or

referred to educational classes rather than substance use treatment. The results of this study suggest that it may be beneficial for people with alcohol-related legal problems (including DWI as well as other crimes committed while intoxicated) to be promptly screened for AUD and diverted to substance use treatment. General legal problems were also associated with increased odds of having a lifetime and current AUD (though not as strongly as alcohol-related legal problems), which is consistent with research showing that over a third of people convicted of DWI also report other (perhaps non-alcohol-related) crimes (Pilkinton, Robertson, & McCluskey, 2013).

Among people who used drugs, those reporting drug-related legal problems had high rates of current and lifetime DUD diagnosis compared to those who used drugs but denied drug-related legal problems. Though adjusted odds ratios were comparable, it is notable that among the two types of current legal problems, people with general legal problems (not necessarily related to substance use) were more likely to have a DUD diagnosis than people with drug-related legal problems. This finding may reflect the illegality of drugs and suggest that people with DUDs are more likely to be involved in high-risk environments involving both substance- and non-substance-related crime. Also, people involved in illegal activities that would be classified as drug-related (i.e., drug distribution) may be less likely to engage in personal use. Indeed, there is a segment of those who sell illicit drugs (e.g., cocaine and heroin) who do not use the particular drug that they sell (Stanforth, Kostiuik, & Garriott, 2016), so these individuals may not have greater risk of DUDs. Thus, people who use drugs and are involved in the criminal justice system for non-substance-related offenses may have increased risk of a DUD, warranting more intensive treatment. Research should continue to consider the instrumental nature of crimes resulting in general legal problems to better understand the relationship between such crimes and SUDs. However, given the cross-sectional nature of the NESARC-III, we cannot evaluate causal associations between substance use and criminal involvement.

People with a lifetime history of substance-related legal problems had high rates of AUD or DUD at some point in their lifetime, and notably, also (albeit not as strongly) had high rates of a current AUD or DUD diagnosis. This is consistent with research showing an association between criminal justice involvement and subsequent problematic substance use (Wu et al., 2014; Lapham et al., 2011; Palamar et al., 2015). These results suggest that arrests, incarcerations, or other contact with the legal system, regardless of whether it is substance-related, may provide useful clinical information about SUDs.

Supplementary analyses showed that women with substance and non-substance related legal problems were more likely to meet diagnostic criteria for SUDs than men. Although criminal involvement (Moore et al., in press) and substance use disorders (Grant et al., 2015; Wu et al., 2014; Palamar et al., 2014) are more common among men, these findings are consistent with population-based studies showing that women with substance use disorders have greater risk of incarceration than men (authors et al., in press), and that gender differences in crime are less pronounced among people with psychiatric disorders (Siroitch, 2008).

The results of this study have important clinical implications for people who are at risk of involvement, or are currently involved in, the criminal justice system. High rates of arrest for non-violent crimes and punitive approaches toward drug-related crime contribute to the overrepresentation of people with SUDs in the criminal justice system. Moreover, despite the high prevalence of SUDs among people involved in the justice system, data collected in 2015 shows that up to 62% of arrestees report never having received behavioral health treatment (Hunt, Peters, & Kremling, 2015). Further, incarceration is predictive of poor outcomes (e.g., mortality) among people who use substances (Skogens et al., 2018). Therefore, it is critical to treat the substance use that prompts legal problems to ultimately prevent repeated justice system involvement and the subsequent consequences of this involvement. People involved in the legal system who are mandated can benefit from SUD treatment, and efforts that divert people from incarceration into substance use treatment continue to be important.

Limitations

This study has several limitations. Legal problems were self-reported, and thus based on participants' perceptions instead of official records of arrest and incarceration. However, there are also advantages to using self-reported legal problems; not all legal problems would be captured by official records and more minor contacts such as interactions with police or receiving charges that were ultimately dismissed may not be reflected on official records. Further, participants may have better insight into the degree to which their use of drugs and alcohol contributed to episodes of criminal involvement. In addition, because the question about general legal problems did not exclude those associated with drug or alcohol use, it is possible that participants may have reported substance-related legal problems when answering that question, thus introducing overlap among these variables. The NESARC-III data is cross-sectional and although data was available for both lifetime and current diagnosis of SUDs, it is possible that the timing of self-reported legal problems did not correspond with that of SUD diagnoses. It is important to note that these relationships may not generalize to other countries due to differences across criminal justice systems and laws regarding drugs and alcohol. Finally, it should be noted that adjusted odds ratios, rather than risk ratios, were estimated from the models. Therefore, caution should be noted when interpreting the AORs as actual risk.

Conclusions

In a recent population-based sample of U.S. adults with self-reported justice system involvement, DSM-5 diagnosed AUDs and DUDs are highly prevalent, particularly for adults with current alcohol-related legal problems and women with any type of legal problems. Adults with drug-related legal problems are most likely to have a stimulant use disorder. Results such as these continue to identify the need to provide community-based addiction prevention and intervention to those at risk of involvement in the criminal justice system.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Source of Funding. 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 the intramural program, NIAAA, NIH. This work was supported by funding from NIDA T32DA019426–12 (KEM). The work described in this article does not express the views of NIH. The views and opinions expressed are those of the authors. Sponsors and funders of the NESARC-III, and specific funders of this study, had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and the decision to submit the manuscript for publication.

Biographical notes

Kelly E. Moore, PhD is a licensed clinical psychologist and Assistant Professor in the Department of Psychology at East Tennessee State University. Dr. Moore received her PhD in Clinical Psychology from George Mason University in 2016. She completed a predoctoral internship at the University of Mississippi Medical Center and a NIDA T32 postdoctoral fellowship at Yale University School of Medicine. Her research interests include understanding and reducing factors that contribute to criminal justice system involvement and poor adjustment after release from incarceration, and the adaptation of evidence-based treatments for justice-involved populations and settings. Dr. Moore has focused much of her work on understanding the psychological and behavioral consequences of the stigma associated with a criminal record.

Lindsay M. Oberleitner, Ph.D. is an Assistant Professor in Psychiatry at the Yale University School of Medicine (YSM) and the Associate Director of the Forensic Drug Diversion Clinic. Dr. Oberleitner received her Ph.D. in Clinical Psychology from Wayne State University in Detroit, and completed her postdoctoral training at the YSM. She is a licensed clinical psychologist with clinical expertise in addiction and forensics. Dr. Oberleitner's primary research interests are intersections of substance use disorders and chronic health conditions, primarily with individuals with criminal justice involvement.

Brian Pittman, MS has been a statistician within the Department of Psychiatry at the Yale School of Medicine since 2003. He earned his Master of Science degree in Biostatistics from Columbia University in 1993. Prior to joining Yale, he spent ten years studying oncology at the Institute for Cancer Prevention (aka, American Health Foundation), serving as the primary statistician on numerous basic science, epidemiologic, and clinical studies focused on cancer prevention. Throughout the span of his career, Brian has co-authored more than 150 scientific, peer-reviewed manuscripts. His collaborative work has focused on the analysis of longitudinal/correlated data, utilizing general linear models and non-parametric methods for the analysis of repeatedly measured psychiatric data with floor effects or other skewed distributions. He is proficient in SAS, SPSS and numerous statistical power software. Brian serves as editor and frequent reviewer on numerous scientific journals in the fields of oncology and psychiatry.

Walter Roberts, PhD is a NIDA postdoctoral fellow in the Department of Psychiatry at Yale University School of Medicine and a licensed clinical psychologist. His research focuses on developing pharmacotherapies for treating alcohol and tobacco use disorders.

Terril L. Verplaetse, PhD is an associate research scientist in the Department of Psychiatry at Yale School of Medicine. Dr. Verplaetse received her Ph.D. in Addiction Neuroscience from Indiana University Purdue University Indianapolis in 2014 and completed her postdoctoral fellowship at Yale School of Medicine in 2017. Her research interests include understanding the neural mechanisms underlying addictive behaviors, understanding the role of stress in drug self-administration and relapse, and using human laboratory paradigms to screen medications for alcohol use disorders and tobacco dependence, including targeting sex-appropriate pharmacotherapeutic treatments for these disorders. Dr. Verplaetse has focused much of her work on understanding noradrenergic involvement in stress-precipitated drinking and cigarette smoking behavior.

Robyn L Hacker, PhD is a psychologist at the University of Colorado's Center for Dependency, Addiction and Rehabilitation (CeDAR). Dr. Hacker received her PhD in Counseling Psychology from Arizona State University in 2017 and completed pre- and post-doctoral fellowships in Forensic Addiction Services within the Division of Law and Psychiatry at Yale University School of Medicine. Dr. Hacker's research interests include exploration of the relationship between trauma and addiction and treatments that concurrently treat these symptomologies. She is also involved in the development and evaluation of online interventions that facilitate understanding of mental illness and addiction within the criminal justice system.

MacKenzie R. Peltier, PhD is a NIDA postdoctoral fellow in the Department of Psychiatry at Yale University School of Medicine. Dr. Peltier received her PhD in Clinical Psychology from Louisiana State University in 2017 and completed her predoctoral internship at the VA Connecticut Healthcare System—West Haven. Her primary research interests include investigating sex differences in the etiology and treatment of substance use disorders, with specific emphasis on the role of endocrinology.

Sherry A. McKee, PhD is a Professor of Psychiatry at the Yale Medical School, Director of the Yale Behavioral Pharmacology Laboratory, and Clinical Director of the Forensic Drug Diversion Clinic. Dr. McKee directs a translational program of research focused on treatment development for addictive disorders, with an emphasis on women and more recently criminal justice populations. Her work spans clinical trials, behavioral pharmacology, survey research, and epidemiological research to uncover mechanisms underlying poor outcomes and to translate these findings into improved interventions. She is the PI for Yale's Translational Center to Develop Gender Sensitive Therapeutics for Addiction (Yale-SCOR). For this effort, she directs an interdisciplinary team conducting translational cross-species research focused on expediting the development of gender-sensitive therapeutics, mentoring junior faculty, and providing a national resource on women and addiction. Dr. McKee also leads a federally funded partnership between Yale University, the of Connecticut Department of Mental Health and Addiction Services, and the State of Connecticut Department of Correction, to develop and implement an integrated system of addiction care for offender re-entry.

References

- Baley JW, & Hoffman NG (2015). The impact of the proposed changes for the DSM-5 on diagnoses of first-time DUI/DWI offenders. *Substance Use and Misuse*, 50, 1747–1752. [PubMed: 26646360]
- Blumstein A (2011). Bringing down the U.S. prison population. *The Prison Journal*, 91, 12S–26S.
- Bronson J, Stroop J, Zimmer S, & Berzofsky M (2017). Drug use, dependence, and abuse among state prisoners and jail inmates, 2007–2009. Bureau of Justice Statistics, U.S. Department of Justice. Available at <https://www.bjs.gov/content/pub/pdf/dudasppi0709.pdf>.
- Caetano R, & McGrath C (2005). Driving under the influence (DUI) among U.S. ethnic groups. *Accident: Analysis and Prevention*, 37, 217–224. [PubMed: 15667807]
- Chou PS, Goldstein RB, Smith SM, Huang B, Ruan WJ, Zhang H, Jung J, Saha TD, Pickering RP, & Grant BF (2016). The epidemiology of DSM-5 nicotine use disorder: Results from the national epidemiologic survey on alcohol and related conditions-III. *Journal of Clinical Psychiatry*, 77, 1189–1200. [PubMed: 27780317]
- Drugs and crime. (2017). Bureau of Justice Statistics, U.S. Department of Justice. Available at <https://www.bjs.gov/index.cfm?ty=tp&tid=35>.
- Fearn NE, Vaughn MG, Nelson EJ, Salas-Wright CP, Qian C, & DeLisi M (2016). Trends and correlates of substance use disorders among probationers and parolees in the United States 2002–2014. *Drug and Alcohol Dependence*, 167, 128–139. [PubMed: 27515722]
- Feucht TE, & Gfroerer J (2011). Mental and substance use disorders among adult men on probation or parole : Some success against a persistent challenge. *Substance Abuse and Mental Health Services Administration*, 1–16.
- Gillespie NA, Neale MC, Prescott CA, Aggen SH, & Kendler KS (2007). Factor and item response analysis of DSM-IV criteria for abuse of and dependence on cannabis, cocaine, hallucinogens, sedatives, stimulants, and opioids. *Addiction*, 102, 920–930. [PubMed: 17523987]
- Grant BF, Amsbary M, Chu A, Sigman R, Kali J, & Sugawana Y (2014). Source and accuracy statement: National epidemiologic survey on alcohol and related conditions-III (NESARC-III), National Institute on Alcohol Abuse and Alcoholism.
- Grant BF, Goldstein RB, Saha TD, Chou SP, Jung J, Zhang H, Pickering RP, Ruan WJ, Smith SM, Huang B, Hasin DS (2015). Epidemiology of DSM-5 alcohol use disorder: Results From the national epidemiologic survey on alcohol and related conditions III. *JAMA Psychiatry*, 72, 757–766. [PubMed: 26039070]
- Hasin DS, Greenstein E, Aivadyan C, Stohl M, Aharonovich E, Saha T, Goldstein R, Nunes EV, Jung J, Zhang H, & Grant BF (2015). 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 and Alcohol Dependence*, 148, 40–46. [PubMed: 25604321]
- Hunt E, Peters RH, & Kremling J (2015). Behavioral health treatment history among persons in the justice system: Findings from the arrestee drug abuse monitoring II program. *Psychiatric Rehabilitation Journal*, 38, 7–15. [PubMed: 25799302]
- Ihongbe TO, & Masho SW (2016). Prevalence, correlates and patterns of heroin use among young adults in the United States. *Addictive Behavior*, 63, 74–81.
- James DJ, & Glaze LE (2005). Mental health problems of prison and jail inmates Bureau of Justice Statistics Special Report, United States Department of Justice Retrieved from <http://www.bjs.gov/content/pub/pdf/mhppji.pdf>.
- Kouri EM, Pope HG, Powell KF & Oliva PS (1997). Drug use history and criminal behavior among 133 incarcerated men. *American Journal of Drug and Alcohol Abuse*, 23, 413–419. [PubMed: 9261489]
- Lapham SC, Stout R, Laxton G, & Skipper BJ (2011). Persistence of addictive disorders in a first-offender driving while impaired population. *Archives of General Psychiatry*, 68, 1151–1157. [PubMed: 21727248]
- Minton TD (2013). Jail inmates at mid-year 2012-statistical tables. Bureau of Justice Statistics Report, United States Department of Justice Retrieved from <https://www.bjs.gov/content/pub/pdf/jim12st.pdf>.

- Nyamathi AM, Salen BE, Farabee D, Hall E, Zhang S, Marifisee M, Khalilifard F, Musto S, Faucette M, & Leake B (2014). Correlates of heroin and methamphetamine use among homeless male ex-jail and prison offenders. *Addiction Research & Theory*, 22, 463–473. [PubMed: 25489295]
- Authors (in press). Psychiatric disorders and crime in the U.S population. *Journal of Clinical Psychiatry*.
- Palamar JJ, Davies S, Ompad DC, Cleland CM, & Weitzman M (2015). Powder cocaine and crack use in the United States: An examination of risk for arrest and socioeconomic disparities in use. *Drug and Alcohol Dependence*, 149, 108–116. [PubMed: 25702933]
- Peters RH, Kremling J, & Hunt E (2015). Accuracy of self-reported drug use among offenders: Findings from the arrestee drug abuse monitoring–II program. *Criminal Justice and Behavior*, 42, 623–643.
- Pilkinton MW, Robertson A, & McCluskey DL (2013). Drugged driving: increased traffic risks involving licit and illicit substances. *Journal of Drug Education*, 43, 183–201. [PubMed: 25068170]
- Proctor SL (2012). Substance use disorder prevalence among female state prison inmates. *The American Journal of Drug and Alcohol Abuse*, 38, 278–285. [PubMed: 22443915]
- Proctor SL & Hoffman NG (2012). Identifying patterns of co-occurring substance use disorders and mental illness in a jail population. *Addiction Research and Theory*, 20, 492–503.
- Sirotych F (2008). Correlates of crime and violence among persons with mental disorder: An evidence based review. *Brief Treatment and Crisis Intervention*, 8, 171–194.
- Skogens L, Greigg N, Berlin M, & Bergmark A (2018). A 30-year follow up of substance-misusers in Sweden – differences in predictors of mortality between women and men *Addiction Research and Theory*. Advance Online Publication. doi: 10.1080/16066359.2018.1518435
- Stanforth ET, Kostiuk M, & Garriott PO (2016). Correlates of engaging in drug distribution in a national sample. *Psychology of Addictive Behavior*, 30, 138–146.
- Tarter RE, Kirisci L, Mezzich A, & Patton D (2011). Multivariate comparison of male and female adolescent substance abusers with accompanying legal problems. *Journal of Criminal Justice*, 39, 207–211. [PubMed: 21686313]
- Wu LT, Brady KT, Mannelli P, Kileen TK (2014). Cannabis use disorders are comparatively prevalent among nonwhite racial/ethnic groups and adolescents: A national study. *Journal of Psychiatric Research*, 50, 26–35. [PubMed: 24342767]

Table 1.Baseline descriptive statistics ($n = 36,309$).

	N or M	% or (SD)
Age (years)	45.6	(17.5)
18–29	8,126	22.4%
30–44	10,135	27.9%
45–64	12,242	33.7%
65+	5,806	16.0%
Sex (Male = 1)	15,862	43.7%
Race		
White	19,194	52.9%
Black	7,766	21.4%
Native American	511	1.4%
Asian/Pacific Islander	1,801	5.0%
Hispanic	7,037	19.4%
Education		
< High School	5,490	15.1%
High School	9,799	27.0%
College or Graduate	21,020	57.9%
Income		
\$0–19,999	16,298	46.6%
\$20,000–\$34,999	8,086	22.3%
\$35,000–\$69,999	7,768	21.4%
\$70,000 or more	3,527	9.7%
Marital Status		
Married/cohabitating	16,794	46.3%
Widowed/ Separated/ Divorced	9,423	26.0%
Never Married	10,092	27.8%
Urbanicity (Urban = 1)	30,193	83.2%
Region		
Northeast	5,180	14.3%
Midwest	7,566	20.8%
South	14,532	40.0%
West	9,031	24.9%
Lifetime Psychiatric Disorder (present)	12,302	33.9%
Current Psychiatric Disorder (present)	8,536	23.5%
Lifetime Alcohol Use Disorder (present)	10,001	27.5%
Current Alcohol Use Disorder (present)	5,133	14.1%
Lifetime Drug Use Disorder (present)	3,548	9.8%
Current Drug Use Disorder (present)	1,487	4.1%
Lifetime Alcohol-related Legal Problems ($n = 31,736$)	3,059	9.9%
Current Alcohol-related Legal Problems ($n = 31,139$)	243	0.8%

	N or M	% or (SD)
Lifetime Drug-related Legal Problems (<i>n</i> = 12,742)	885	6.9%
Current Drug-related Legal Problems (<i>n</i> = 5,107)	137	2.7%
Current General Legal Problems (<i>n</i> = 36,298)	656	1.8%

Note. “Current” refers to the past 12 months from the assessment date. “Lifetime” refers to the period prior to the past 12 months. Unweighted frequencies are reported. Prevalence rates reflect the percentage of individuals meeting criteria for the disorder in the respective time frame.

Table 2.

The prevalence and adjusted risk of alcohol use disorder (AUD) diagnosis among people with alcohol-related and general legal problems.

Type of Legal System Problems	Current ^a AUD Present		Lifetime AUD Present	
	%	OR [95% CI]	%	OR [95% CI]
Current Alcohol-related Legal Problems ^b				
Yes	88.1%	22.0 ^{**} [12.1; 40.1]	91.4%	15.2 ^{**} [7.5; 30.9]
No	15.9%	Ref	30.35%	Ref
Lifetime Alcohol-related Legal Problems ^c				
Yes	38.6%	3.3 ^{**} [3.0; 3.7]	72.6%	5.9 ^{**} [5.2; 6.7]
No	13.7%	Ref	27.0%	Ref
Current General Legal Problems ^d				
Yes	46.7%	3.2 ^{**} [2.6; 4.0]	61.7%	3.2 ^{**} [2.6; 4.0]
No	13.5%	Ref	26.9%	Ref

Note.

* $p < .05$;

** $p < .001$. Unweighted frequencies are reported; analyses reflect data weighted for oversampling of racial/ethnic minorities and nonresponse. Odds ratios are adjusted for gender, age, race/ethnicity, educational attainment, marital status, personal income, urbanicity, region, and the presence of a current (for current legal problems) or lifetime (for lifetime legal problems) psychiatric disorder.

^a“Current” refers to the past 12 months from the assessment date. “Lifetime” refers to the period prior to the past 12 months.

^b Sample is limited to people who reported current alcohol use ($n = 31,139$).

^c Sample is limited to people who reported lifetime alcohol use ($n = 31,736$).

^d Entire sample ($n = 36,298$).

Table 3.

The prevalence and adjusted risk of alcohol use disorder (AUD) diagnosis among people with alcohol-related and general legal problems-excluding people who reported driving while intoxicated (DWI).

Type of Legal System Problems	Current ^a AUD – no DWI ^b		Lifetime AUD – no DWI ^c	
	%	OR [95% CI]	%	OR [95% CI]
Current Alcohol-related Legal Problems				
Yes	68.1%	9.3 ^{**} [4.4; 19.5]	53.3%	3.7 ^{**} [1.4; 9.4]
No	10.7%	Ref	11.9%	Ref
Lifetime Alcohol-related Legal Problems				
Yes	24.9%	2.8 ^{**} [2.4; 3.2]	17.9%	1.3 [*] [1.0; 1.6]
No	9.3%	Ref	11.7%	Ref
Current General Legal Problems				
Yes	28.6%	2.2 ^{**} [1.7; 2.8]	27.3%	2.0 ^{**} [1.5; 2.8]
No	9.0%	Ref	9.9%	Ref

Note.

^{*} $p < .05$,

^{**}

$p < .001$. Unweighted frequencies are reported; analyses reflect data weighted for oversampling of racial/ethnic minorities and nonresponse. DWI = Driving while intoxicated. Odds ratios are adjusted for gender, age, race/ethnicity, educational attainment, marital status, personal income, urbanicity, region, and the presence of a current (for current legal problems) or lifetime (for lifetime legal problems) psychiatric disorder.

^a“Current” refers to the past 12 months. “Lifetime” refers to the period prior to the past 12 months before the assessment date.

^b 1,955 people who reported driving while intoxicated in the past 12 months were removed from the current diagnosis variable resulting in $n = 34,354$.

^c 7,039 people reporting any history of driving while intoxicated were removed from the lifetime diagnosis variable resulting in $n = 29,270$.

Table 4.

The prevalence and adjusted risk of drug use disorder (DUD) diagnosis among people with drug-related and general legal problems.

Type of Legal System Problems	Current ^a DUD Present		Lifetime DUD Present	
	%	OR [95% CI]	%	OR [95% CI]
Current Drug-related Legal Problems ^b				
Yes	65.0%	3.3 ^{**} [2.1; 5.2]	73.0%	3.0 ^{**} [1.8; 5.0]
No	28.1%	Ref	40.1%	Ref
Lifetime Drug-related Legal Problems ^c				
Yes	27.8%	2.6 ^{**} [2.1; 3.2]	68.0%	5.1 ^{**} [4.3; 6.1]
No	10.2%	Ref	24.5%	Ref
Current General Legal Problems ^d				
Yes	23.5%	3.5 ^{**} [2.8; 4.4]	36.1%	3.3 ^{**} [2.7; 4.1]
No	3.7%	Ref	9.3%	Ref

Note. $p < .05$;

^{**} $p < .001$. Unweighted frequencies are reported; analyses reflect data weighted for oversampling of racial/ethnic minorities and nonresponse. Odds ratios are adjusted for gender, age, race/ethnicity, educational attainment, marital status, personal income, urbanicity, region, and the presence of a current (for current legal problems) or lifetime (for lifetime legal problems) psychiatric disorder.

^a "Current" refers to the past 12 months from the assessment date. "Lifetime" refers to the period prior to the past 12 months.

^b Sample is limited to people who reported current drug use ($n = 5,107$)

^c Sample is limited to people who reported lifetime drug use ($n = 12,742$)

^d Entire sample ($n = 36,298$).

Table 5.

The prevalence and adjusted risk of *lifetime* marijuana use, opioid use, stimulant use, and other drug use disorder diagnoses among people with drug-related and general legal problems.

Type of Legal Problems	Marijuana Use Disorder Present		Opioid Use Disorder Present		Stimulant Use Disorder Present		Other Drug Use Disorder Present	
	%	OR [95% CI]	%	OR [95% CI]	%	OR [95% CI]	%	OR [95% CI]
Current Drug-related ^a								
Yes	51.1%	2.0* [1.2; 3.1]	16.8%	2.1* [1.2; 3.8]	28.5%	2.7** [1.7; 4.5]	16.1%	2.7* [1.4; 5.1]
No	25.3%	Ref	10.4%	Ref	11.6%	Ref	6.9%	Ref
Lifetime Drug-related ^b								
Yes	37.3%	2.4** [2.0; 2.9]	20.3%	4.1** [3.3; 5.1]	37.0%	5.4** [4.5; 6.5]	14.5%	3.3** [2.4; 4.6]
No	16.0%	Ref	5.0%	Ref	7.7%	Ref	4.0%	Ref
Current General ^c								
Yes	24.4%	2.9** [2.2; 3.8]	10.1%	2.9** [2.0; 4.3]	13.1%	2.8** [2.0; 3.9]	7.0%	2.1** [1.5; 3.1]
No	5.8%	Ref	2.0%	Ref	3.3%	Ref	1.6%	Ref

Note.

* $p > .05$,

**

$p < .001$. Unweighted frequencies are reported; analyses reflect data weighted for oversampling of racial/ethnic minorities and nonresponse. Drug use disorder diagnoses are not mutually exclusive. Due to low sample size, inhalant use, hallucinogen use, sedative use, club drug use, and other drug use disorder diagnoses were combined into an "other drug use" disorder category. Odds ratios are adjusted for gender, age, race/ethnicity, educational attainment, marital status, personal income, urbanicity, region, and the presence of a current (for current legal problems) or lifetime (for lifetime legal problems) psychiatric disorder.

^aSample is limited to people who reported current drug use ($n = 5,107$)

^bSample is limited to people who reported lifetime drug use ($n = 12,742$)

^cEntire sample ($n = 36,298$).