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Self-Reported ADHD Diagnosis and Illicit Drug Use and Prescription Medication Misuse among U.S. Working-Age Adults

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Abstract

Objective: To estimate differences by self-reported lifetime ADHD diagnosis status in the percentage of U.S. working-age (18–64-year-old) adults in 2023 who report lifetime and past-year use or misuse of 11 different categories of illicit drugs and prescription medications, overall and among those without a self-reported drug use disorder (DUD).

Method: We analyze data from the 2023 National Wellbeing Survey (total sample unweighted N=7,044; no DUD sample unweighted N=6,484) to estimate lifetime and past-year use of seven illicit drugs (marijuana, powder cocaine, crack cocaine, methamphetamine, heroin, fentanyl, and hallucinogens) and misuse of four prescription medications (opioids, tranquilizers, sedatives, and stimulants) among working-age adults, by self-reported lifetime ADHD diagnosis status,

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[2]·In a preliminary analysis, we compared the lifetime and past-year estimates of illicit drug use and prescription medication misuse from the 2023 NWS with prevalence estimates from the 2023 NSDUH (see Supplemental Table 1). Comparison of available estimates in Panel A indicates that the 2023 NWS provides highly comparable (within +/− 1 percentage point) estimates of ever use or misuse of marijuana, powder cocaine, prescription opioids, and prescription sedatives, but over-estimates ever use or misuse of crack cocaine, methamphetamine, heroin, prescription tranquilizers, and prescription stimulants to varying degrees. No comparable estimates of lifetime use of fentanyl or hallucinogens are available. Comparison of estimates in Panel B indicates that the 2023 NWS provides highly comparable estimates of past-year misuse of prescription opioids, prescription tranquilizers, prescription sedatives, and prescription stimulants, and over-estimates of past-year use of marijuana, powder cocaine, crack cocaine, methamphetamine, and heroin to varying degrees. Overall, the 2023 NWS tends to over-estimate use and misuse of substances relative to the 2023 NSDUH even though the pattern of relatively higher (e.g., marijuana), moderate (i.e., powder cocaine), and lower (e.g., heroin) use or misuse of specific types of drugs and medications across the two surveys is quite similar.

sex, age, race/ethnicity, nativity, education, and rural-urban residence. Weighted descriptive and multivariable logistic regression model estimates are obtained for the total population and for the subpopulation without a self-reported DUD.

Results: In 2023, lifetime and past-year use or misuse of all 11 categories of drugs and medications was significantly higher among working-age adults with ADHD than among those without ADHD. Statistically significant differences by self-reported ADHD status persisted in multivariable models that controlled for demographic characteristics, with adjusted odds ratios (AORs) ranging from 1.77 for lifetime misuse of prescription sedatives to 3.08 for lifetime misuse of prescription stimulants, and from 1.63 for past-year use of crack cocaine to 3.33 for past-year misuse of prescription stimulants. Among those with no DUD, results indicated significantly higher lifetime use or misuse among persons with ADHD than among persons without ADHD for all 11 categories of drugs and mediations, with AORs ranging from 1.69 for misuse of prescription opioids to 2.87 for prescription stimulants. Past-year use or misuse among working-age adults never diagnosed with a DUD was significantly higher for 7 of 11 categories of drugs and medications among persons with ADHD relative to persons without ADHD, with statistically significant AORs ranging from 1.54 for use of heroin to 3.48 for misuse of prescription stimulants.

Conclusion: Results suggest that ADHD is a risk factor for higher illicit drug use and prescription medication misuse among U.S. working-age adults, even in the absence of a DUD. Clinicians working with adults with ADHD should assess use and misuse of a broad range of drugs and medications regardless of whether the person with ADHD has a co-occurring DUD diagnosis, and engage in therapeutic interventions when appropriate. Future national data collection efforts that include measures of drug use and medication misuse (e.g., NSDUH, NHIS, BRFSS) should include measures of lifetime and current ADHD diagnosis, symptoms, and treatment history.

Keywords

ADHD; drug use; substance use disorder; social epidemiology; working-age adults

INTRODUCTION

Adult attention-deficit/hyperactivity disorder (ADHD) is associated with increased risk for substance use disorder (SUD) (Capusan et al., 2019; DiLorenzo et al., 2021; Sundquist et al., 2015; Zulauf et al., 2014), with the onset of SUD typically following the onset of ADHD (Taurines et al., 2010; Breyer et al., 2014). Children and adolescents with ADHD are at higher risk of developing SUD in adolescence and adulthood (Kousha, 2012; Luderer et al., 2018; Molina et al., 2018; Wilens et al., 2011; Zaso, Park, & Antshel, 2020; Zaso et al., 2015). Reward processing dysfunctions, response inhibition deficits, and executive dysfunction have each been implicated in the comorbid ADHD+SUD condition among adults (Asherson et al., 2016). Relatedly, functional impairments among adolescents and adults might lead individuals with ADHD to self-medicate with various substances, which could also contribute to the development of SUD over time (Molina & Pelham, 2014).

While the existing adult ADHD+SUD literature is robust, and various mechanisms that might explain the association have been investigated (Molina & Pelham, 2014; Srichawla et

al., 2022), most of this research has focused on samples of adults with clinically ascertained SUD or ADHD, and on use of marijuana, alcohol, tobacco, and ADHD medications in ways other than prescribed (Choi et al., 2022; Faraone et al., 2020; Howard et al., 2020; Martinez-Luna et al., 2021). For an exception, see Brynte et al. (2022), who focus on comorbid ADHD among persons in nine countries (including the United States) diagnosed with SUD related to use of alcohol, cannabis, hallucinogens, inhalants, opioids, stimulants, sedatives/hypnotics/anxiolytics, and/or tobacco. In contrast to the ADHD+SUD literature, to the best of our knowledge, there are no national, U.S. population-representative estimates of drug use and "misuse"[1] of prescription medications (i.e., taking medication when it is not prescribed or when it is taken more frequently than prescribed, to get high, or by crushing pills to get the dose faster) among adults with ADHD, or comparative studies of how drug use of illicit drugs and misuse of prescription medications varies by clinically assessed or self-reported ADHD diagnosis status. Moreover, almost no research has focused specifically on drug use and medication misuse among adults diagnosed with ADHD who do not have a co-occurring drug use disorder (DUD). These gaps in the literature exist, at least in part, because most national, population-representative health surveys that include measures of drug use do not regularly collect data on adult ADHD (e.g., National Health Interview Survey [NHIS], National Survey on Drug Use and Health [NSDUH], Behavioral Risk Factor Surveillance System [BRFSS]).

The absence of U.S. population-representative research on drug use and medication misuse among adults with ADHD, differences in drug use and medication misuse by ADHD diagnosis status, and research on drug use and medication misuse among adults diagnosed with ADHD but not DUD is a notable gap in the literature. Some ADHD researchers have proposed that considering substance use dimensionally – and not simply categorically (i.e., disorder, no disorder) – would be clinically useful and has the potential to inform interventions to reduce morbidity later in life (Katzman et al., 2017). To the extent that drug use and medication misuse contributes to elevated mortality risk among adults with ADHD (Ajnakina et al., 2022; London & Landes, 2016; 2022; Schiavone et al., 2022), research on drug use and medication misuse among adults with ADHD (overall and among those without a DUD) might also contribute to interventions that reduce excess ADHD-related mortality in the adult population.

Investigating drug use and medication misuse among working-age adults with ADHD will enhance our understanding of ADHD, DUD risk, and the nexus of the two across the life course. Several studies have followed children with ADHD into early adulthood and reported higher use of marijuana, alcohol, and tobacco (Howard et al., 2020). However, few studies have considered drug use and medication misuse among adults with ADHD

[1]We acknowledge that the use of the term "misuse" in scientific research on substance use is increasingly discouraged because of its potentially stigmatizing connotations (Saitz et al., 2021; Voon & Keer, 2013; see also, https://www.canada.ca/en/public-health/services/publications/healthy-living/communicating-about-substance-use-compassionate-safe-non-stigmatizing-ways-2019.html). We use the term "misuse" in this paper with specific reference to use of prescribed medications in ways that are not consistent with medical guidelines. This use of the term "misuse" is consistent with World Health Organization guidelines and with how questions about "misuse" of prescribed medications were asked in the National Wellbeing Survey (see the Data and Methods section). We use the term to descriptively distinguish in a parsimonious way not-as-prescribed use of medications from prescribed use of medications (the latter of which is not included in the construct we aim to study in this paper). Our intent is descriptive, although we recognize the potential that our use of the term unintentionally stigmatizes those who engage in the behaviors we are defining and describing.

beyond early adulthood or examined use and misuse of a broader range of substances than marijuana, alcohol, tobacco and ADHD medications in ways other than prescribed. Likewise, nearly all of the published literature on ADHD and drug use and medication misuse that has used U.S. population-representative data has focused on adolescents and young adults (Lee et al., 2011) and/or persons with diagnosed SUD. Given the increasing rates of drug-related mortality among working-age adults over the past three decades (National Academies of Sciences, Engineering, and Medicine, 2021), it is critical to gain a clearer understanding of drug use and medication misuse risk among working-age adults with ADHD compared to their peers without ADHD. This is also important because ADHD-related problems with employment, financial management, social relationships, and health may be exacerbated by drug use and medication misuse (Das et al., 2012; Kosheleff et al., 2023). Documentation of use and misuse of a broad range of drugs and medications among working-age adults with ADHD, differences in drug use and medication misuse by self-reported ADHD diagnosis status, and patterns of use and misuse among those with ADHD but without DUD can help clinicians develop more-targeted screening and/or prevention interventions.

The current project aims to fill four existing gaps in the extant adult ADHD literature by: (1) providing U.S. population-level estimates of drug use and medication misuse for adults with versus without a self-reported ADHD diagnosis, which are rarely available due to limitations of national, population-representative health surveys; (2) focusing on working-age adults, rather than adolescents and young adults exclusively; (3) including a broader range of drugs than is usually studied (i.e., we include 11 categories of illicit drugs and prescription medications); and (4) estimating self-reported ADHD diagnosis status differences in drug use and medication misuse among persons who have never been diagnosed with a DUD, which can provide clinically relevant information that is not currently available in the literature.

DATA AND METHODS

Data

We use data from the 2023 National Wellbeing Survey (NWS) (Monnat et al., 2023) – perhaps the only contemporary national survey of U.S. adults that simultaneously measures self-reported ADHD and DUD diagnosis statuses and use of a broad range of illicit drugs and misuse of several categories of prescription medications. The NWS is an annual, cross-sectional, web-based survey of non-institutionalized 18–64-year-old U.S. adults who can read English. NWS participants are recruited online by, and the survey is administered through, Qualtrics Panels (see Monnat et al., 2024 for details about the NWS design, sample recruitment, and demographic representativeness). The 2023 survey was the first to include a question about ADHD diagnosis status. For the 2023 NWS, 167,451 Qualtrics panel members were initially e-mailed. Of those, 38,519 clicked the link to the survey landing page and 18,499 were deemed eligible to participate. Overall, 14,891 panel members completed the survey. Collectively, Qualtrics and the NWS research team dropped 7,786 surveys due to concerns about data quality (e.g., speeding, straight-lining), resulting in 7,105 completed quality surveys. Accordingly, the overall response rate as traditionally defined

is 8.9%, while the quality survey completion rate among those who accessed the survey landing page and were eligible to complete it is 38.4%. Online surveys historically have low overall response rates. The NWS response rate is in line with other national online surveys, including the U.S. Census Bureau's Household Pulse Survey (ranging from 6.5% to 7.0%) and the 2023 U.S. National Center for Health Statistics (NCHS) Rapid Surveys System (ranging from 3.8% to 4.0%). The 2023 NWS quality survey completion rate is near the estimated average (44.1%) for web-based surveys (Wu, Zhao, & Fils-Aime, 2022).

Participants completed the survey between June and September of 2023. The NWS oversamples residents of nonmetropolitan counties, but the dataset includes a post-stratification weight to make analyses demographically representative of the U.S. non-institutionalized population ages 18–64 with respect to sex, age group, race, Hispanic ethnicity, education, and rural-urban continuum. As described in detail in London, Monnat, & Gutin (2025), the self-rated health status of the 2023 NWS sample is less healthy than that of the general population (based on comparisons to the NHIS). Because ADHD is correlated with health status, we followed the procedure documented in London et al. (2025) and standardized the NWS weight variable to the 2023 NHIS self-rated health distribution. Doing so makes the population represented by the NWS sample more representative of the U.S. national population with respect to health and enhances sample generalizability. We use the standardized weight in all analyses.

Measures

Independent Variable. The focal independent variable is self-reported ADHD diagnosis status (yes=1, no=0). Participants were asked: "Have you ever been told by a doctor, nurse, or other health care professional that you have any of the following medical conditions?" This question stem was followed by a list of 14 medical conditions. In the 2023 NWS, "Attention Deficit Hyperactivity Disorder (ADHD) or Attention Deficit Disorder (ADD)" was one of the listed medical conditions.

Dependent Variables. The NWS measures self-reported usage of 11 categories of drugs that are each assessed with reference to two time periods: lifetime use (i.e., ever used) and past-year use. These 11 categories of drugs are separated into two categories: illicit drugs and prescription medications. Six of the illicit drugs were classified as illegal in all states and at the federal level at the time the 2023 NWS data collection was done. Use of marijuana, while legal in some states in 2023, remains classified as illegal at the federal level. These 11 dichotomous variables serve as the dependent variables for the current investigation. NWS question wording follows that of the NSDUH.

For the seven illicit drugs, participants were first asked: "Have you ever used any of the following substances, even once in your lifetime?" Participants who answer "yes" to this first question were then asked: "Have you used any of these substances in the past 12 months?" The illicit substances assessed in the NWS are: cannabis, marijuana, or hashish (sometimes prescribed and partially legalized as of 2022); powder cocaine; crack cocaine; methamphetamine (crank, speed, ice, glass, crystal); heroin; fentanyl; and hallucinogens (LSD).

For the four broad categories of prescription medications, participants were asked: “Have you ever misused any of the following prescription medications?” In addition to providing parenthetical examples of various subtypes of the medication, the survey included a definition of misuse: “Misuse refers to use of the medication either when it was not prescribed for the participant or when it was taken in a way that was not prescribed by a physician (i.e., the prescription medication was taken more frequently than prescribed, to get high, or by crushing pills to get the dose faster).” Again, participants who responded “yes” to having ever misused a given prescription medication were asked the follow-up question about past-year misuse of that category of prescription medication. The verbatim prescription medication categories included in the survey are as follows: opioids (oxycodone, hydrocodone, OxyContin, Percocet, Vicodin, Lortab, Dilaudid, methadone); tranquilizers (Benzodiazepines, Xanax, Ativan, Valium, Klonopin, Clonazepam, Soma, Xylazine [Tranq]); sedatives (Methaqualone, Nembutal, Pentobarbital, Phenobarbital); and stimulants (Amphetamines, Methylphenidate, Adderall, Ritalin) (Monnat et al., 2023).

Control Variables. We include a set of demographic covariates in the multivariable models. These include: sex (female=1, male=0); categorical age (18–29, 30–39, 40–49, 50–64 years); race/ethnicity (non-Hispanic White, non-Hispanic Black/African American, non-Hispanic Asian/Pacific Islander, Hispanic [all races], non-Hispanic multiple or other race); and nativity (foreign-born=1, U.S.-born=0). In addition to these variables that are exogenous to ADHD-drug use and medication misuse associations, we also control for two variables that might be affected by ADHD, drug use and medication misuse, or both. These covariates are: educational attainment (less than high school, high school graduate, Associate’s degree/some college, Bachelor’s degree or higher) and rural-urban residence. Rural-urban residence is measured using the U.S. Department of Agriculture Economic Research Service’s nine-category rural-urban continuum codes that distinguish metropolitan from non-metropolitan geographies (see Table 1 for category labels).

Analytic Approach

Analyses are run on the total analytic sample and the subsample of working-age adults who have never been diagnosed with a DUD. Participants self-reported ever being diagnosed with a DUD, which is included in the list of 14 medical conditions that follow the question stem about diagnosis by a heath care professional (see discussion of the measurement of self-reported ADHD above). Individuals who have ever been diagnosed with a DUD (unweighted N=560; weighted percent=7.1%) are dropped from the analytic sample used to produce estimates for the working-age adult population that has never been diagnosed with a DUD.

We estimate descriptive statistics to characterize: (1) the total population represented by the weighted analytic sample; and (2) the population never diagnosed with a DUD represented by the weighted analytic subsample. We then estimate lifetime and past-year rates of illicit drug use and medication misuse overall and by self-reported ADHD diagnosis status in the total population and in the subpopulation never diagnosed with a DUD. Finally, we estimate multivariable logistic regression models of lifetime and past-year illicit drug use and medication misuse for each of the 11 categories of drugs and medications assessed in

the 2023 NWS for the total population and for the subpopulation never diagnosed with a DUD. Each model includes self-reported ADHD diagnosis status and the control variables described above.

After removing 61 participants who had missing information on at least one of the variables used in this study, the final analytic samples includes 7,044 participants for analyses based on the total sample and 6,484 for analyses based on the subsample of persons never diagnosed with a DUD. Unless otherwise indicated, all analyses are weighted using the standardized NWS weight variable described above. All analyses were conducted using Stata 18.

RESULTS

Population Description

Table 1 presents a description of the total working-age population represented by the total analytic sample and the population represented by the analytic sample never diagnosed with a DUD by a health care professional. Although the two populations are demographically similar, we include both population descriptions because we present distinct estimates obtained from parallel analyses run on each analytic sample. Here, we focus on describing the characteristics of the total population.

The total working-age population is half male-identified and half female-identified. Approximately half are between the ages of 18 and 39 years, and half are between the ages of 40 and 64 years. While 58.7% are classified as non-Hispanic White, 11.8% are classified as non-Hispanic Black/African American, 18.5% as Hispanic (all races), 6.1% as Asian/Pacific Islander, and 5.0% as other or multiple race/ethnicity. Approximately 8% are foreign born. Slightly more than one-third have achieved high school or less educational attainment, while about one-third have achieved an Associate's degree/some college, and one-third have a Bachelor's degree or more. Although more than half of the working-age population lives in cities with a million or more inhabitants, 12.9% of working-age adults live in nonmetro areas.

Self-Reported Drug Use and Medication Misuse in the Total Population

Table 2 presents the percentage of the total working-age population who self-reported using or misusing 11 different categories of illicit drugs and prescription medications ever and in the past year, overall and by self-reported ADHD diagnosis status.[1] Focusing first on Panel A in Table 2, overall, lifetime use or misuse is highest for marijuana (53.1%), followed by cocaine (18.7%), hallucinogens (15.2%), methamphetamine (13.1%), and prescription opioids (10.9%). For each of the other six substances—crack, heroin, fentanyl, prescription sedatives, prescription tranquilizers, and prescription stimulants—lifetime use or misuse is below 10%. For each of the 11 categories of drugs and medications, lifetime use or misuse is significantly higher among those with ADHD than among those without ADHD. For all of the drug and medication categories except misuse of prescription sedatives, lifetime use is above 10% among those who self-report ever being diagnosed with ADHD. By contrast, lifetime use is only above 10% for marijuana, cocaine, methamphetamine, and hallucinogens

among those who self-report never being diagnosed with ADHD. Differences in lifetime use by self-reported ADHD diagnosis status are particularly large (above 10 percentage points) for marijuana, cocaine, methamphetamine, hallucinogens, and misuse of prescription stimulants.

Panel B in Table 2 focuses on past-year use and misuse. Overall, about one-third of the working-age population used marijuana in the past year. The past-year use rate is above 5% only for one other drug (methamphetamine). For each of the other nine categories of drugs and medications, past-year use or misuse is between 1.1% and 3.7%. For each of the 11 categories of drugs and medications, past-year use is significantly higher among those with ADHD than among those without ADHD. Among working-age adults with ADHD, past-year use or misuse is above 5% for marijuana, cocaine, methamphetamine, fentanyl, hallucinogens, prescription opioids, prescription tranquilizers, and prescription stimulants. By contrast, among working-age adults never diagnosed with ADHD, past-year use is above 5% only for marijuana. Differences in past-year use and misuse between persons who self-report ever and never being diagnosed with ADHD are 5 percentage points or more for marijuana, methamphetamine, hallucinogens, and prescription stimulants.

Drug Use and Medication Misuse in the Population Without a DUD

Table 3 presents the percentage of the working-age population without a DUD who reported use or misuse each of the 11 categories of illicit drugs and prescription medications ever and in the past year, overall and by self-reported ADHD diagnosis status. Focusing first on Panel A, the overall pattern of use in this subpopulation is similar to that observed for the total population, although levels of use are lower, as would be expected given that the subpopulation excludes working-age adults who report that they have ever been diagnosed with a DUD. As was the case for the total population, in this subpopulation, lifetime use of all 11 categories of drugs and medications is significantly higher among those with ADHD than among those without ADHD. In this subpopulation, lifetime use or misuse is over 10% for marijuana, powder cocaine, methamphetamine, hallucinogens, prescription opioids, and prescription stimulants.

Panel B presents estimates for past-year use or medication misuse among working-age adults who have never been diagnosed with a DUD. For 8 of the 11 categories of drugs and medications, past-year use or misuse is significantly higher among those with ADHD relative to those without ADHD. No significant difference in past-year use is observed for three relatively low-prevalence substances: crack cocaine, heroin, and fentanyl.

Multivariable Analyses

Table 4 summarizes results from the multivariable logistic regression models. For each of the 11 categories of drugs and medications, we estimated a model for lifetime and past-year use or misuse that included self-reported ADHD diagnosis status and all control variables. Panel A presents the results from models estimated on the total sample; Panel B presents the results from models estimated on the subsample without a DUD. The reported adjusted odds ratio (AOR) is the adjusted odds of the outcome for those with ADHD relative to those without ADHD.

As seen in Table 4, Panel A, for each outcome, the AOR is statistically significant for both lifetime and past-year use, indicating significantly higher drug use and medication misuse among adults with ADHD relative to their peers without ADHD. For lifetime use, the AORs are all above 2.00 except for misuse of prescription sedatives (AOR=1.77). It is notable that odds of lifetime misuse of prescription stimulants are more than three times higher (AOR=3.08) among those with ADHD relative to those without ADHD. For past-year use and misuse, the results are quite similar to those for lifetime use and misuse, with AORs ranging from 1.63 for crack cocaine to 3.33 for prescription stimulants.

Panel B in Table 4 presents a parallel set of results estimated on working-age adults who have never been diagnosed with a DUD. In this subpopulation, lifetime use or misuse of each substance is significantly higher among those ever diagnosed with ADHD than those never diagnosed with ADHD. AORs range from 1.69 for prescription opioids to 2.87 for prescription stimulants. Past-year use or misuse is significantly higher among those with ADHD for 7 of the 11 categories of drugs and medications: marijuana, methamphetamine, heroin, hallucinogens, prescription tranquilizers, prescription sedatives, and prescription stimulants. Statistically significant AORs for past-year use or misuse range from 1.66 for use of heroin and hallucinogens, respectively, to 3.48 for misuse of prescription stimulants.

DISCUSSION

This paper makes four primary contributions to the literature on ADHD and substance use and medication misuse. First, we use population-representative data to compare drug use and medication misuse among working-age adults with and without a self-reported ADHD diagnosis. Few national, U.S. population-representative studies examine illicit drug use and medication misuse among adults with ADHD or differences in illicit drug use and medication misuse by self-reported ADHD diagnosis status. This is because most national, U.S. population-representative health surveys that include measures of drug use and medication misuse do not collect data on adult ADHD status. We recommend, moving forward, that population health surveys consistently include measures of ADHD diagnosis status, symptoms, and treatment history in order to facilitate replication and extension of the findings we report.

Second and relatedly, most existing studies that focus on ADHD and substance use do not include middle-aged adults. Thus, a contribution of this study is its inclusion of a broader, policy- and practice-relevant group of middle-aged adults among whom ADHD-related work, finance, or relationship problems may have been or could be exacerbated by drug use and medication misuse. Additionally, given the increasing first-time diagnosis of ADHD in adulthood (Hutt Vater et al., 2024; London & Landes, 2022), some of these middle-aged adults may have only been recently diagnosed with ADHD (Staley et al., 2024). This raises the possibility that patterns of drug use and medication misuse may become established prior to ADHD diagnosis and therapeutic intervention by a health-care professional for some individuals (Crunelle et al., 2018). This warrants additional attention with longitudinal data that follows individuals to older ages and can appropriately time ADHD symptom onset, diagnosis, and therapeutic intervention in relation to the onset of substance use and SUD.

Third, we include 11 categories of illicit drugs and prescription medications in our investigation, which is a broader range of substances than is usually included in studies of ADHD and substance use. These include: marijuana, powder cocaine, crack cocaine, methamphetamine, fentanyl, heroin, hallucinogens, prescription opioids, prescription tranquilizers, prescription sedatives, and prescription stimulants. We show that working-age adults who self-report that they have ever been diagnosed with ADHD by a health care provider are significantly more likely than their peers who have not been diagnosed to report ever using or misusing each of these drugs and medications in their lifetimes and within the past year. Taken together, these results expand the current literature by documenting self-reported ADHD diagnosis status differences in use and misuse across a broad range of drugs and medications.

Some of the drug use and medication misuse documented in the total sample analyses reflects substance use associated with a DUD. Thus, a fourth contribution of this study is to focus attention on the subpopulation of working-age adults who have never (or not yet) been diagnosed with a DUD. While the ADHD+SUD subpopulation has received considerable attention in the psychiatric literature, drug use and medication misuse among persons who self-report ADHD but do not have DUD has not received as much. Among working-age adults who have never been diagnosed with a DUD, we find significantly higher lifetime use or misuse for all 11 drugs and medications and significantly higher past-year use or misuse for 7 of the 11 drugs and medications in multivariable models. Our findings of substantial levels of illicit drug use and prescription medication misuse in this subpopulation is relevant clinically for individual health, as well as for population health. At the individual level, our findings suggest that providers should screen individuals with ADHD for drug use and medication misuse regardless of whether they have been diagnosed with a DUD (Crunelle et al,, 2018). Some may eventually be diagnosed with a DUD, but others may never be. At the level of the population, given associations between ADHD and a range of health conditions and premature mortality, interventions aimed at reducing drug use and medication misuse could contribute to improvements in population health and well-being.

This research has some limitations that point to directions for future research. These include: reliance on self-reported rather than clinically assessed ADHD and DUD diagnoses (i.e., a limitation that exists across all studies based on surveys), which might reflect over- and mis-diagnosis to some extent; an exclusive focus on lifetime as opposed to current diagnoses (although the difference between the two is only about 2 percentage points [Staley et al., 2024]); sampling from an online panel rather than using a gold-standard multi-stage random sampling design; the use of cross-sectional data that prevent the determination of the timing and sequencing of use initiation and diagnosis over the life course; and having limited information regarding the lifetime history of stimulant medication treatment. Additionally, we did not include alcohol or tobacco use both because they are measured differently than illicit drug use and prescription medication misuse, and because dynamics related to the supply and purchase of tobacco and alcohol are much different. Finally, we do not include solvent use because it is not measured in the NWS (Monnat et al., 2023).

Despite these limitations, the results reported in this paper are both novel and clinically significant. Assuming that these findings are replicated, there are at least four possible

clinical implications that emerge. First and foremost, clinicians should recognize that ADHD itself is a risk factor for higher drug use and medication misuse, even in the absence of a diagnosable DUD. Psychoeducation about drug use and medication misuse risks and healthier coping mechanisms could be integrated into routine primary care practice for adults who have ADHD. Primary care treatment plans for adults with ADHD could include drug use and medication misuse screening and interventions, even for those with ADHD who do not meet criteria for a DUD. Second, drug use and medication misuse could be an indicator of co-occurring anxiety, depression, or sleep disorders, all of which are common in adults with ADHD. Primary care clinicians could continue to screen and treat these co-occurring conditions. Third, interventions like Cognitive Behavioral Therapy (CBT) could be incorporated to address impulsivity and reward-seeking behaviors that might contribute to higher levels of drug use and medication misuse (van Emmerik-van Oortmerssen et al., 2019). Likewise, higher drug use and medication misuse rates might indicate attempts to self-medicate ADHD symptoms, particularly emotional dysregulation (Holborn, Schifano, & Deluca, 2023). Effective ADHD management may reduce reliance upon drug use and medication misuse for the purpose of self-medication. Finally, prescribing clinicians should continue to engage in therapeutic interventions regarding stimulant medication misuse. This is a complex issue, especially among those who do not meet current criteria for a DUD. On the one hand, not prescribing stimulants may inadvertently contribute to higher rates of self-medicating with non-prescribed substances. On the other hand, if stimulant misuse by adults with ADHD who do not have a co-occurring DUD at the population level is nearly 12%, as reported in this study, then clinicians must be concerned about potential iatrogenic treatment effects. At this point, thoughtful prescribing, monitoring, and patient education might support proper medication use while addressing concerns about misuse (Choi et al., 2022; Callovini et al., 2024).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1:

Sample Description

	TOTAL			NO DRUG USE DISORDER	
	%[1]	N[2]		%[1]	N[2]
Sex					
Male	49.9	3,301		49.5	3,002
Female	50.1	3,743		50.5	3,482
Age (in Years)					
18–29	25.6	1,854		25.7	1,729
30–39	22.7	1,697		21.8	1,491
40–49	21.1	1,499		20.9	1,359
50–64	30.6	1,994		31.6	1,905
Race/Ethnicity					
White, NH	58.7	4,239		57.8	3,836
Black/African American, NH	11.8	905		12.2	865
Hispanic	18.5	1,317		18.6	1,220
Asian/Pacific Islander, NH	6.1	364		6.4	355
Other/Multiple Race, NH	5.0	219		5.1	208
Nativity					
Foreign Born	8.3	497		8.7	483
U.S. Born	91.7	6,547		91.3	6,001
Education					
Less than High School	10.5	713		9.8	610
High School	26.4	2,167		25.4	1,945
Associate’s Degree/Some College	31.5	2,467		31.7	2,293
Bachelor’s Degree or More	31.7	1,697		33.1	1,636
Rural-Urban Continuum					
Metro, 1 Million or More population	56.8	3,190		57.4	2,979
Metro, 250,000–1 Million population	21.1	1,151		20,9	1,052
Metro, <250,000 population	8.9	859		8.8	786
Large Nonmetro, Adjacent to Metro Area	4.1	567		3.9	503
Large Nonmetro, Not Adjacent to Metro Area	1.5	209		1.4	184
Medium Nonmetro, Adjacent to Metro Area	4.2	516		4.1	466
Medium Nonmetro, Not Adjacent to Metro Area	2.3	287		2.3	271
Small Nonmetro, Adjacent to Metro Area	0.1	115		0.5	106
Small Nonmetro, Not Adjacent to Metro Area	0.7	150		0.7	137

Notes: NH=Non-Hispanic

1. Weighted percent.

2. Unweighted number of cases in the sample.

Table 2:

Percent Using Substances Ever and in the Past Year, Overall and by ADHD Diagnosis Status, Total NWS Sample

PANEL A: EVER	2023 NWS			No ADHD			ADHD		
Illicit Drugs (Use)	**%**	**[95% CI]**		**%**	**[95% CI]**		**%**	**[95% CI]**	**p**
Marijuana	53.1	[51.8–54.4]		50.0	[48.6–51.4]		70.4	[67.4–73.4]	<.001
Powder Cocaine	18.7	[17.7–19.7]		16.8	[15.8–17.9]		28.9	[26.0–31.8]	<.001
Crack Cocaine	9.0	[8.3–9.7]		7.8	[7.1–8.5]		15.9	[13.6–18.2]	<.001
Methamphetamine	13.1	[12.3–14.0]		11.5	[10.6–12.3]		22.4	[19.8–25.1]	<.001
Heroin	6.0	[5.5–6.6]		5.0	[4.4–5.6]		11.7	[9.7–13.7]	<.001
Fentanyl	5.2	[4.6–5.7]		4.1	[3.6–4.7]		10.9	[8.9–12.8]	<.001
Hallucinogens	15.2	[14.3–16.1]		13.3	[12.3–14.2]		26.0	[23.2–28.9]	<.001
Prescription Medications (Misuse)									
Opioids	10.9	[10.1–11.7]		9.4	[8.6–10.2]		19.3	[16.8–21.8]	<.001
Tranquilizers	7.5	[6.8–8.2]		6.3	[5.6–7.0]		14.2	[12.0–16.4]	<.001
Sedatives	2.9	[2.4–3.3]		2.5	[2.1–2.9]		4.8	[3.4–6.2]	<.01
Stimulants	7.6	[6.9–8.3]		5.7	[5.1–6.4]		18.0	[15.5–20.5]	<.001
PANEL B: PAST-YEAR	**TOTAL**			**No ADHD**			**ADHD**		
Illicit Drugs (Use)	**%**	**[95% CI]**		**%**	**[95% CI]**		**%**	**[95% CI]**	**p**
Marijuana	33.9	[32.7–35.1]		30.6	[29.3–31.9]		52.4	[49.1–55.6]	<.001
Powder Cocaine	3.7	[3.2–4.2]		3.1	[2.6–3.6]		7.2	[5.5–8.9]	<.001
Crack Cocaine	2.0	[1.7–2.4]		1.8	[1.4–2.2]		3.3	[2.2–4.4]	<.01
Methamphetamine	5.6	[5.1–6.2]		4.5	[4.0–5.1]		11.8	[9.9–13.8]	<.001
Heroin	1.7	[1.4–2.0]		1.3	[1.0–1.7]		3.6	[2.4–4.8]	<.001
Fentanyl	2.3	[2.0–2.7]		1.8	[1.4–2.2]		5.3	[3.9–6.8]	<.001
Hallucinogens	3.7	[3.2–4.1]		2.9	[2.4–3.4]		8.0	[6.2–9.7]	<.001
Prescription Medications (Misuse)									
Opioids	3.6	[3.1–4.1]		3.1	[2.6–3.5]		6.7	[5.1–8.3]	<.001
Tranquilizers	2.4	[2.0–2.8]		1.8	[1.4–2.2]		5.7	[4.3–7.3]	<.001
Sedatives	1.1	[0.8–1.4]		0.9	[0.7–1.2]		1.9	[1.0–2.9]	<.05
Stimulants	2.7	[2.2–3.1]		1.9	[1.5–2.2]		7.0	[5.3–8.7]	<.001

Table 3:

Percentage Using Substances Ever and in the Past Year, Overall and by ADHD Diagnosis Status, NWS Participants with No Drug Use Disorder

PANEL A: EVER USED	2023 NWS			No ADHD			ADHD		
Illicit Drugs (Use)	**%**	**[95% CI]**		**%**	**[95% CI]**		**%**	**[95% CI]**	**p**
Marijuana	50.2	[48.9–51.6]		47.9	[46.4–49.3]		65.4	[61.9–68.8]	<.001
Powder Cocaine	15.0	[14.1–15.9]		14.1	[13.1–15.1]		21.0	[18.0–23.9]	<.001
Crack Cocaine	6.0	[5.4–6.6]		5.5	[4.9–6.2]		9.1	[7.0–11.1]	<.001
Methamphetamine	9.1	[8.4–9.9]		8.4	[7.6–9.2]		13.8	[11.4–16.3]	<.001
Heroin	3.4	[2.99–3.9]		3.1	[2.6–3.6]		5.4	[3.8–7.0]	<.001
Fentanyl	3.0	[2.5–3.4]		2.6	[2.1–3.0]		5.5	[3.9–7.2]	<.001
Hallucinogens	12.4	[11.5–13.2]		11.3	[10.4–12.2]		19.4	[16.5–22.2]	<.001
Prescription Medications (Misuse)									
Opioids	7.5	[6.8–8.2]		6.8	[6.1–7.5]		12.1	[9.8–14.5]	<.001
Tranquilizers	5.0	[4.4–5.6]		4.4	[3.8–5.0]		8.7	[6.7–10.7]	<.001
Sedatives	2.2	[1.8–2.6]		1.9	[1.5–2.3]		4.0	[2.5–5.4]	<.001
Stimulants	5.0	[4.5–5.6]		4.0	[3.4–4.5]		11.7	[9.3–14.1]	<.001
PANEL B: PAST-YEAR USE	**TOTAL**			**No ADHD**			**ADHD**		
Illicit Drugs (Use)	**%**	**[95% CI]**		**%**	**[95% CI]**		**%**	**[95% CI]**	**p**
Marijuana	31.2	[29.9–32.5]		30.6	[29.3–31.9]		52.4	[49.1–55.6]	<.001
Powder Cocaine	2.4	[2.0–2.8]		2.2	[1.8–2.6]		4.0	[2.5–5.5]	<.01
Crack Cocaine	1.0	[0.8–1.3]		1.1	[0.8–1.3]		0.9	[0.3–1.5]	.606
Methamphetamine	2.8	[2.3–3.2]		2.4	[1.9–2.8]		5.4	[3.8–7.0]	<.001
Heroin	0.7	[0.4–0.9]		0.7	[0.4–0.9]		1.0	[0.2–1.7]	.405
Fentanyl	1.0	[0.7–1.2]		0.9	[0.6–1.2]		1.5	[0.6–2.5]	.103
Hallucinogens	2.5	[2.1–2.9]		2.2	[1.8–2.6]		4.6	[3.1–6.2]	<.001
Prescription Medications (Misuse)									
Opioids	2.3	[1.9–2.7]		2.1	[1.7–2.5]		3.4	[2.1–4.8]	<.05
Tranquilizers	1.3	[1.0–1.6]		1.0	[0.7–1.3]		2.6	[1.5–3.8]	<.001
Sedatives	1.0	[0.7–1.2]		0.8	[0.5–1.1]		1.8	[0.8–2.9]	<.05
Stimulants	1.6	[1.2–1.9]		1.1	[0.8–1.5]		4.4	[2.8–6.0]	<.001

Table 4:

Multivariable Logistic Regression Analyses of Lifetime and Past-Year Substance Use by ADHD Diagnosis Status, NWS Participants with No Drug Use Disorder

PANEL A: TOTAL NWS		**EVER USED**				**PAST-YEAR USE**		
Illicit Drugs (Use)		**ADHD AOR[1]**	**[95% CI]**	**p**		**ADHD AOR[1]**	**[95% CI]**	**p**
Marijuana		2.22	[1.89–2.60]	<.001		2.15	[1.85–2.50]	<.001
Powder Cocaine		2.11	[1.77–2.52]	<.001		2.00	[1.45–2.76]	<.001
Crack Cocaine		2.28	[1.84–2.84]	<.001		1.63	[1.08–2.46]	<.05
Methamphetamine		2.09	[1.72–2.54]	<.001		2.22	[1.72–2.85]	<.001
Heroin		2.10	[1.64–2.70]	<.001		2.25	[1.45–3.47]	<.001
Fentanyl		2.22	[1.71–2.89]	<.001		2.37	[1.61–3.47]	<.001
Hallucinogens		2.24	[1.87–2.69]	<.001		2.21	[1.62–3.01]	<.001
Prescription Medications (Misuse)								
Opioids		2.00	[1.62–2.47]	<.001		2.05	[1.47–2.84]	<.001
Tranquilizers		2.06	[1.63–2.60]	<.001		2.80	[1.93–4.06]	<.001
Sedatives		1.77	[1.22–2.59]	<.01		1.96	[1.04–3.68]	<.05
Stimulants		3.08	[2.45–3.86]	<.001		3.33	[2.32–4.77]	<.001
PANEL B: NO DRUG USE DISORDER		**EVER USED**				**PAST-YEAR USE**		
Illicit Drugs (Use)		**ADHD AOR[1]**	**[95% CI]**	**p**		**ADHD AOR[1]**	**[95% CI]**	**p**
Marijuana		1.95	[1.65–2.32]	<.001		2.01	[1.70–2.38]	<.001
Powder Cocaine		1.80	[1.45–2.22]	<.001		1.59	[0.99–2.54]	.053
Crack Cocaine		1.83	[1.37–2.45]	<.001		0.77	[0.37–1.59]	.477
Methamphetamine		1.77	[1.38–2.28]	<.001		1.94	[1.32–2.87]	<.001
Heroin		1.90	[1.53–2.35]	<.001		1.66	[1.09–2.53]	<.05
Fentanyl		1.92	[1.31–2.79]	<.001		1.54	[0.73–3.25]	.260
Hallucinogens		1.90	[1.53–2.35]	<.001		1.66	[1.09–2.53]	<.05
Prescription Medications (Misuse)								
Opioids		1.69	[1.29–2.21]	<.001		1.56	[0.97–2.53]	.069
Tranquilizers		1.84	[1.34–2.53]	<.001		2.47	[1.40–4.36]	<.01

Sedatives		1.98	[1.25–3.14]	<.01		2.19	[1.06–4.54]	<.05
Stimulants		2.87	[2.14–3.85]	<.001		3.48	[2.12–5.69]	<.001

Notes:

1. ADHD AOR is the adjusted odds ratio comparing the odds of use among persons ever diagnosed with ADHD to the odds of use among persons never diagnosed with ADHD derived from models that include control variables. Models control for: Sex; Age; Race/Ethnicity; Nativity; Education; and Urban-Rural Continuum.