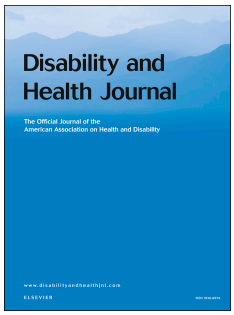

Drug and alcohol use disorders among adults with select disabilities: the National Survey on Drug Use and Health

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Drug and alcohol use disorders among adults with select disabilities: the National Survey on Drug Use and Health

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Drug and alcohol use disorders among adults with select disabilities: the National Survey on Drug Use and Health

Abstract

Background: Deaths caused by drugs and alcohol have reached high levels in the US, and prior research shows a consistent association between disability status and substance misuse.

Objective: Using national data, this study quantifies the association between disability status and drug and alcohol use disorders among US adults.

Methods: The most recent pre-pandemic years (2018-2019) of the cross-sectional National Survey on Drug Use and Health (n = 83,439) were used to examine how the presence of any disability, and specific disabilities, were associated with past year drug and alcohol use disorders. Logistic regression was used to estimate adjusted odds ratios (aORs) controlling for potential sociodemographic confounders.

Results: Adults with any disability had increased odds of drug (aOR=2.7; 95% CI=2.5–3.0), and alcohol use disorder (aOR=1.8; 95% CI=1.6–2.0), compared to adults without disability. Examining specific types of disabilities, adults with cognitive limitations only had increased odds of drug (aOR=3.1; 95% CI=2.6–3.6), and alcohol use disorders (aOR=2.2; 95% CI=1.9–2.5), compared to adults without disability. Smaller associations were observed between vision and complex activity limitations and drug use disorder. Adults with two or more types of limitations had increased odds of drug (aOR=3.7; 95% CI=3.3–4.3), and alcohol use disorders (aOR=2.3; 95% CI=2.0–2.6).

Conclusions: The presence of disability, especially cognitive limitation only, or two or more types of limitations, is associated with elevated odds of drug and alcohol use disorder among US adults. Additional research should examine the temporal relationship between and mechanisms linking disability and substance misuse.

1. Introduction

Deaths caused by drugs and alcohol have reached unprecedented levels in the US,[1,2] and in response, researchers have examined a range of characteristics to describe populations at greatest risk for these occurrences.[3–8] A growing body of evidence indicates that there is a strong and positive association between substance misuse and disability status.[3,4,8–23] Disability is the result of an interaction between an individual's abilities and their environment, which limits participation in a range of activities, rather than an inherent or immutable characteristic of an individual.[24] Disability can be categorized by the level and type of difficulty that individuals experience, including auditory, visual, ambulatory, cognitive, self-care and independent living limitations, which prior research shows to vary with age, sex and other demographic characteristics.[25] Disability is also associated with lower socioeconomic position, including educational attainment[26] and poverty.[27] Furthermore, approximately 40% of disabled adults have more than one type of disability,[25] which has received limited attention in previous investigations.

The majority of prior studies on disability and substance misuse have assessed substance misuse among adults using a binary indicator of any disability,[14–16,18,22] or by specific singular types of disability.[9,10,13,17,19,20,23,28,29] Research which used a dichotomous measure to indicate the presence or absence of any disability, defined as inability to work, the presence of specific conditions, or limitations in performing certain activities,[15–19] reported increased substance misuse among persons with any disability. Other research which assessed specific disabilities, like deafness or blindness, in relation to substance misuse[9,13,15,17,23,28] also shows positive associations between the presence of each of these conditions and different types of substance misuse. Specifically, adults with hearing difficulty display increased prevalence of lifetime illicit

drug use,[17] and opioid-related emergency department visits,[23] compared to adults without hearing difficulty. Likewise, adults with vision limitations have reported increased lifetime use of illicit drugs,[17] and current opioid use disorder,[21] compared to adults without vision limitations. Recently, up to six different disability categories were examined in relation to opioid misuse, with results indicating increased prevalence of opioid use disorder among adults with cognitive,[21,30] self-care, and independent living difficulty.[30] Similarly, higher rates of substance-related disorders among adults with intellectual disabilities,[19,20,29] and alcohol use among young people with emotional and learning disability have been observed.[31]

There is also limited evidence that people with multiple disabilities are at greater risk for substance misuse than individuals with one disability.[11,17,21] In a study of US adults, persons with both vision and hearing loss had a higher prevalence of lifetime drug use, compared to adults with either condition alone.[17] Similarly, college students with two or more disabilities have reported increased misuse of drugs and alcohol, compared to college students with one type of disability.[11] Lastly, the prevalence of opioid use disorder has been shown to increase with the number of reported disabilities among adults in the general population.[21] Thus, the research that has examined the presence of multiple disabilities in relation to substance misuse indicates increased misuse among persons with more than one disability.

Because many of the correlates of disability are also associated with substance misuse, a careful consideration of confounding is required in this area of research. Like disability, substance misuse is associated with age, sex, education and poverty,[6,12,15,21,26,27] and these covariates are often included as adjustment factors in statistical modeling.[9,15,16,21] The consistent finding of higher rates of disability, but lower rates of substance misuse, among women

compared to men,[6,14,25,32] also raises the possibility that sex could be an effect modifier of the association between disability and substance misuse.

Although research during the last 20 years has demonstrated a clear link between disability status and substance misuse, most prior studies[11,14–16,18,22] have utilized binary disability measures or focused exclusively on one type of disability.[9,13,17,19,20] Recently, some have examined opioid use disorder by disability type,[21,30] but not alcohol use disorder or drug use disorder more broadly (i.e. including stimulants and non-opioid tranquilizers). The objective of the current study was to examine which disability types and combinations are associated with the greatest risk for drug and alcohol use disorders, and to evaluate the strength of these associations after controlling for known sociodemographic covariates and considering potential effect modification by sex, which is an especially salient characteristic in disability and substance misuse research.

2. Methods

2.1 Data source

This cross-sectional analysis utilizes data from the most recent pre-pandemic (i.e. 2018-2019) National Survey on Drug Use and Health (NSDUH) public-use microdata files. The NSDUH is a nationally-representative survey of the US civilian non-institutionalized population ages 12 years and older which gathers health and demographic information, as well as detailed information on substance use.[33] Pre-pandemic data were used because COVID-19 necessitated increased reliance on telephone, rather than in-person interviewing, which might have under sampled adults with hearing and other disabilities. Two years of data were pooled to increase the sample of adults with specific disabilities. NSDUH response rates were 66.6% and 64.9% in 2018 and 2019, respectively.[34]

The NSDUH data were collected using audio computer-assisted self-interviewing, which allows survey participants to enter their responses directly into a computer. The NSDUH Field Manual provides specific guidance for interviewing blind and deaf respondents. Blind respondents listened to recordings of the questions using headphones and input their answers using the computer keypad.[35] Deaf respondents read the survey questions themselves and entered their responses using the computer keypad.[35] Interviews took place in a private space within the respondent's home and lasted approximately one hour.[36]

The combined NSDUH 2018 and 2019 surveys included 112,449 participants. To describe the association between disability and substance misuse among adults, survey participants younger than age 18 (n = 26,684) were excluded. This exclusion resulted in 85,765 adult respondents who were age 18 or older at the time of the interview. The analytic sample was

then restricted to participants with no missing values for the analytic variables, who comprised 97.3% of respondents who met age criteria for inclusion. After applying these criteria, the final analytic sample size was n=83,439.

2.2 Disability Measures

The NSDUH includes questions recommended by the US Department of Health and Human Services (HHS) for the identification of disabilities in population-based surveys, which have been used widely in disability research.[26,37,38] Furthermore, the validity of HHS disability measures has been corroborated through comparisons with the longer and more detailed National Health Interview Survey.[39] The six HHS-recommended questions are: *Are you deaf or do you have serious difficulty hearing? [Y/N]; Are you blind or do you have serious difficulty seeing, even when wearing glasses? [Y/N]; Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions? [Y/N]; Do you have serious difficulty walking or climbing stairs? [Y/N]; Do you have difficulty dressing or bathing? [Y/N]; Because of a physical, mental or emotional condition, do you have difficulty doing errands alone such as visiting a doctors' office or shopping? [Y/N]*.

For this analysis, disability was assessed as:1) any disability versus no disability (dichotomous); 2) seven mutually-exclusive types of specific disabilities[21,40,41]: 1) no disability (the reference group); 2) hearing disability only; 3) vision disability only; 4) cognitive disability only; 5) mobility disability only; 6) complex activity disability only; 7) two or more types of disabilities. Complex activity disability was defined as a positive response to either the dressing and bathing question, or the errands and doctors' office questions.

142 *2.3 Drug and Alcohol Misuse*

143 The NSDUH drug and alcohol use disorder categories were based on the American
144 Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders 4th Revision
145 (DSM-IV). Hereafter, "drug use disorder" refers to illicit drug dependence or abuse in the past
146 year, and "alcohol use disorder" refers to alcohol dependence or abuse in the past year.
147 Importantly, "illicit" drug dependence and abuse includes use of heroin, cocaine and
148 methamphetamine, and prescription opioids, benzodiazepines and stimulants when these are used
149 without a prescription or in a way that is inconsistent with a prescriber's instructions.

150 *2.4 Covariates*

151 Sociodemographic covariates were selected based on the existing literature.[14,16] These are
152 age (24-25, 26-34, 35-49, 50-64, ≥65); sex (female, male); race/ethnicity (Hispanic, non-
153 Hispanic American Indian/Alaska Native, non-Hispanic Native Hawaiian/Pacific Islander, non-
154 Hispanic Asian, non-Hispanic Black, non-Hispanic more than one race, non-Hispanic White);
155 marital status (married, never married, divorced/separated, widowed); education (less than high
156 school, high school graduate, associate's degree/some college (no degree), bachelor's degree or
157 higher); employment (employed full time, employed part time, unemployed, not in the labor
158 force); and poverty (at or below the poverty level, up to two times the poverty level, more than
159 two times the poverty level). Race/ethnicity is conceptualized by the authors as a proxy for
160 survey respondent's potential experiences of privilege, discrimination, or segregation, rather than
161 a biological trait. Poverty level was based on family size and income according to the federal
162 guidelines.[42]

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2.5 Statistical analyses

Descriptive statistics were generated to summarize the disability categories and demographic and socioeconomic characteristics of the study population. Unweighted counts and weighted percentages were calculated, and *t*-tests were used to compared the distributions of demographic, socioeconomic and disability characteristics of adults in the total population, and adults with both drug and alcohol use disorders. Logistic regression models were developed to evaluate the strength of the association between drug and alcohol use disorders separately with disability status. Crude and adjusted odds ratios (ORs and aORs) and 95% confidence intervals (CIs) were computed. Odds ratios were considered statistically significant if the confidence intervals did not include the null value of one. Disability status was dichotomous in the analysis comparing any disability to no disability (reference), and a seven-level categorical variable in the analysis comparing specific disability types and combinations to no disability (reference).

Two multivariable logistic models were developed. The first included adjustment for the demographic covariates age, sex, and race/ethnicity. The second was adjusted for the aforementioned covariates, and socioeconomic covariates education, employment, marital status, and poverty. An interaction term was also used to determine whether sex was a statistically-significant effect modifier. Where significant interactions were present, analyses were stratified by sex and repeated to determine the sex-specific association between disability and substance use disorders. Statistical analyses were performed using weight, cluster and stratum to account for the complex design of the NSDUH. Survey year was also included as a covariate in all models. The Institutional Review Board of (removed for double-blind review) classified this research project as exempt.

3. Results

3.1 Distributions of sociodemographic characteristics and substance misuse

Distributions of sociodemographic characteristics of the study population are presented in Table 1, along with unweighted counts and weighted percentages of cases of drug and alcohol use disorders. Within the study population of 2018-2019 NSDUH respondents, total unweighted cases of past year substance use disorder were 3,536 for drugs and 6,061 for alcohol. In the summary that follows, only statistically-significant differences are highlighted. Comparing the weighted distributions of the sociodemographic characteristics of the total population with the subpopulations with drug and alcohol use disorders reveals several disproportionately affected groups. Men, persons ages 18-34 years old, non-Hispanic persons of more than one race, persons with less than a bachelor's degree, never married and divorced persons, persons at less than two times the federal poverty level, and persons who were unemployed or employed part-time, were overrepresented among those with drug use disorder. Men, persons ages 18-49, non-Hispanic white persons, persons with an associate's degree or some college but no degree, never married and divorced persons, and persons who were unemployed or not in the labor force were overrepresented among those with alcohol use disorder.

3.2 Distributions of disability status and substance misuse

Sample sizes and the prevalence of disabilities by disability type and combination within the study population are presented in Table 2, along with weighted percentages of drug and alcohol use disorders. Adults with no disability comprised 79.4% of the target population, and the prevalence of specific disabilities was 3.5% with cognitive limitation only, 3.3% with

mobility limitation only, 2.9% with hearing limitation only, 2.0% with vision limitation only, 0.9% with complex activity limitation only, and 8.0% with two or more types of disabilities.

In the summary that follows, only statistically-significant differences are highlighted. Drug and alcohol use disorders were elevated among adults with any disability, who comprised 20.6% of the target population but accounted for 37.0% of adults with drug use disorder and 25.4% of adults with alcohol use disorder. Despite making up 3.5% of the target population, adults reporting only a cognitive disability accounted for 11.5% of adults with drug use disorder and 7.8% of adults with alcohol use disorder. Similarly, adults with two or more types of disabilities made up 8.0% of the target population, but accounted for 17.6% of adults with drug use disorder and 11.0% of adults with alcohol use disorder. Also overrepresented among adults with drug use disorders were adults with complex activity limitation, who made up 0.9% of the target population but accounted for 2.1% of adults with drug use disorder. Adults with hearing limitation only, and mobility limitation only were underrepresented among adults with drug and alcohol use disorders.

3.3 Odds of drug misuse by disability

Results from logistic regression models assessing relationships between disability and drug use disorder are summarized in Table 3, including unadjusted and adjusted estimates. In the fully-adjusted model, drug use disorder was positively associated with the presence of any disability (aOR = 2.7; 95% CI = 2.5 – 3.0). Examinations of specific disability types as compared to adults with no disability revealed that the magnitude of the association was higher among adults with cognitive limitation only (aOR = 3.1; 95% CI = 2.6 – 3.6), complex activity limitation only (aOR = 2.2; 95% CI = 1.6 – 3.0). Adults with two or more types of limitations had even higher adjusted odds of drug use disorder (aOR = 3.7; 95% CI = 3.3 – 4.3). Weaker

associations were observed for adults in the vision limitation only category (aOR = 1.6; 95% CI = 1.2 – 2.1) as compared to those with no disability. Comparing results across the three models suggests both positive and negative confounding effects. For cognitive limitation only, adjustment for both demographic (model 2) and socioeconomic (model 3) covariates weakened the association with drug misuse. For adults with two or more types of limitations, adjustment for demographic (model 2) and socioeconomic (model 3) covariates strengthened the association with drug use disorder.

3.4 Odds of alcohol misuse by disability

Results from logistic regression models assessing the relationships between disability and alcohol use disorder are summarized in Table 4. Elevated alcohol use disorder was observed among adults with one or more disabilities. The fully-adjusted estimate indicated approximately two times the odds of alcohol use disorder among adults with any disability, compared to adults without disability (aOR = 1.8; 95% CI: 1.6 – 2.0). Alcohol use disorder was also associated with two of the six specific disability categories examined. The fully-adjusted models showed significantly higher odds of alcohol use disorder among adults with cognitive limitations only (aOR = 2.2; 95% CI = 1.9 – 2.5), and two or more types of limitations (aOR = 2.3; 95% CI = 2.0 – 2.6). Hearing limitation only (aOR = 1.0; 95% CI = 0.7 – 1.6), vision limitation only (aOR = 1.2; 95% CI = 0.9 – 1.6), mobility limitation only (aOR = 0.9; 95% CI: 0.6 – 1.4), and complex activity limitation only (aOR = 1.5; 95% CI = 1.0 – 2.4) were not significantly associated with alcohol use disorder. Comparing results from across the three models indicates positive and negative confounding effects due to demographic (model 2) or socioeconomic (model 3) covariates.

255 *3.5 Evaluation of effect modification by sex*

256 Statistically-significant interactions between disability category and sex were observed in
257 the analysis of alcohol use disorder ($p < 0.01$, Supplemental Table), but not drug use disorder
258 (data not shown). In the fully-adjusted model, the odds of alcohol use disorder among adults with
259 cognitive limitations were stronger for females (aOR = 2.8; 95% CI = 2.3 – 3.4), compared to
260 males (aOR = 1.7; 95% CI = 1.4 – 2.1). For other disability categories, the interaction between
261 disability and sex was either not statistically significant, or the estimated odds ratio was not
262 significantly different from the null in the fully-adjusted model (Supplemental Table).

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4. Discussion

This analysis of nationally representative cross-sectional data supports a positive association between disability status and past year drug and alcohol use disorders. Results show that while approximately 21% of adults report having a disability, adults with disabilities make up approximately 37% of adults with past year drug use disorder and 25% of adults with past year alcohol use disorder. Disaggregating by disability type revealed heterogeneity among adults with hearing, vision, cognitive, mobility, complex activity, and other types of limitations. Adults with cognitive limitations only had slightly more than three times the odds of drug use disorder, while those with two or more types of limitations had nearly four times the odds of drug use disorder, compared to non-disabled adults. In the examination of alcohol, adults with cognitive limitations had approximately two times the odds of alcohol use disorder, compared to non-disabled adults. Adults with hearing and vision limitations did not have significantly elevated odds of alcohol use disorder, compared to non-disabled adults. Adults with two or more types of limitations, also had elevated odds of drug and alcohol use disorders. Controlling for covariates lessened the association between cognitive limitation and drug use disorder, but did not eliminate it altogether. The covariates examined had minimal effect on the estimated odds of alcohol use disorder.

The findings reported herein align with much of the existing literature which shows elevated burden of drug and alcohol misuse among persons with any reported disability.[11–19,22,23,30] Similar to previous studies that focused on the association between any disability and substance use within the NSDUH, the present analysis indicates increased prevalence of drug misuse[14–16,18,22,30] and alcohol misuse[12] among adults with any disability, compared to those without disability. Our analysis uses more recent NSDUH data than most published studies and

examines broad drug and alcohol misuse measures, including dependence and abuse of several classes of illicit and prescription drugs.

Findings from the present analysis also align with and build on previous studies focusing on specific types of disabilities. Using NSDUH data, both Reif et al. and Hong et al. found heterogeneity in the association between different types of limitations and opioid use disorder (OUD), with cognitive limitation displaying elevated prevalence of OUD in both studies.[21,30] The study presented here expands on this work by broadly examining drug use disorder -- including stimulants (i.e. methamphetamine and cocaine), and tranquilizers (i.e. benzodiazepine) – alcohol use disorders, and effect modification by sex. Research by Hinson-Enslin et al. and Akobirshoev et al. investigated hearing difficulty in relation to drug use and found higher lifetime prevalence of illicit drug use,[17] and higher unadjusted odds of opioid-related emergency department visit[23] among adults with hearing difficulty, compared to adults without hearing difficulty. McKee et al. found higher adjusted odds of alcohol use disorder and prescription OUD among younger adults with hearing difficulty, but not among all ages combined.[28] The present study identified a non-significant positive association between hearing difficulty and drug and alcohol use disorders in adjusted models only, and a negative association in unadjusted models. Taken together, these findings demonstrate the complexity of the association between hearing difficulty and substance use, which differs depending on the measure of substance use examined, and the statistical model utilized. In reviews of the literature, McGillicuddy et al. and Burgard et al. report a greater likelihood of negative costs from alcohol use, such as legal and job-related problems, among adults with intellectual disabilities, compared to those without.[13,19] Similarly, Lin et al. identified elevated substance-related disorders among adults with intellectual disabilities living in Ontario, Canada.[29] The study presented here builds on this previous work by using nationally-

representative US data to show that adults with cognitive disability have higher prevalence of past year DSM-IV drug and alcohol use disorders, independent of other sociodemographic characteristics.

4.1 Limitations

Owing to its cross-sectional design and lack of questions about initial onset of either disability or substance use disorder, this analysis cannot determine whether substance use disorder preceded and contributed to disability, or vice versa. Bidirectional relationships between the focal constructs are likely: while the stress of a disability could lead to substance use disorder, the reverse direction is also plausible. There is a large body of literature linking chronic alcohol consumption with cognitive impairment.[43] Alcohol misuse could also increase the risk of traumatic brain injuries involving motor vehicles and falls,[44,45] and drug misuse could increase the risk of non-fatal overdose and hypoxic brain injury.[46] Unfortunately, these questions cannot be resolved with the NSDUH data, but they highlight the need for further longitudinal research which distinguishes between cognitive disabilities of different etiologies. Other limitations include the potential for misclassification of alcohol and/or drug use disorders among adults with certain disabilities. Although the NSDUH provides accommodations for adults with seeing/hearing difficulty, the field manual does not include instructions for gathering information from adults with cognitive disabilities. This could result in the ascertainment of lower quality data from this population. Furthermore, the exclusion of individuals residing in institutional group quarters from the NSDUH sample might omit a portion of the disabled population and differentially exclude adults with more severe disabilities. This limits the generalizability of the present study to non-institutionalized persons with disabilities. Last, the two or more limitations category provides limited information for identifying populations in need of substance misuse

prevention and treatment services. Future studies with larger samples of adults with disabilities and utilizing different kinds of methods (e.g., qualitative in-depth interviews) could be useful in understanding the relationships observed herein. Strengths of the analysis include the use of specific disability categories representing common disability types observed in the large, nationally representative NSDUH data. The analyses also controlled for known confounders and tested for sex differences in the associations.

5. Conclusions

Disability is associated with past year drug and alcohol use disorders among US adults, and the strength of the association varied among adults with different types of disabilities. Of the disability categories examined, cognitive limitations showed an especially strong association with drug and alcohol use disorders in adjusted models. Future research is needed to establish the temporal relationship between disability and substance use disorders, and to better understand substance use disorders among adults with two or more limitations. Further study is also needed to investigate the more pronounced relationship between alcohol use disorder and cognitive disability among females, compared to males, which was observed in both the unadjusted and adjusted analyses. Longitudinal studies that include stressful life events, timing of initiation of substance use disorder, and onset of cognitive disabilities could provide insights into the drivers of the sex differences reported herein. Longitudinal studies could also investigate whether improved access to educational and occupational opportunities reduces the risk of substance use disorder among adults with cognitive disabilities. Efforts to prevent and treat substance use disorders should account for the unique needs of adults with different types of disabilities.

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Table 1. Distribution of sociodemographic characteristics in the overall population and by drug and alcohol misuse: data from 2018-2019 NSDUH survey respondents age 18 years or older

	Total Population n = 83,439		Drug Use Disorder[a] n = 3,536		Alcohol Use Disorder[b] n = 6,061	
	Weighted %	Un-weighted n	Weighted %	Un-weighted n	Weighted %	
Sex						
Female	51.8	1,492	38.4*	2,471	36.5*	
Male	48.2	2,044	61.6*	3,590	63.5*	
Age Group (years)						
18-25	13.2	1,950	33.9*	2,573	22.5*	
26-34	16.1	785	27.9*	1,405	24.1*	
35-49	24.5	603	21.9*	1,479	26.5*	
50-64	25.2	169	13.1*	453	20.5*	
≥65	21.0	29	3.2*	151	6.4*	
Race/Ethnicity						
Hispanic	16.3	596	16.4	996	15.5	
Non-Hispanic American Indian/Alaska Native	<1.0	85	<1.0	136	<1.0	
Non-Hispanic Native Hawaiian/Pacific Islander	<1.0	21	<1.0	38	<1.0	
Non-Hispanic Asian	5.7	91	2.9*	205	3.9*	
Non-Hispanic Black	11.8	436	13.2	579	10.3*	
Non-Hispanic more than one race	1.8	222	3.3*	243	2.1	
Non-Hispanic White	63.6	2,085	62.7	3,864	66.9*	
Educational Attainment						
Less than High School	12.0	532	13.9*	670	10.8	
High School Graduate	24.4	1,142	29.7*	1,529	23.7	
Associate's Degree/ Some College, No Degree	30.8	1,331	36.9*	2,191	33.9*	
Bachelor's Degree or Higher	32.8	531	19.5*	1,671	31.6	

Marital Status					
Married	51.5	508	20.2*	1,505	33.5*
Never Married	28.6	2,637	63.9*	3,808	48.8*
Divorced/ Separated	13.9	359	14.1	669	15.5*
Widowed	6.0	32	1.8*	79	2.2*
Family Poverty Status					
Federal Poverty Level or Below	13.3	923	23.8*	1,098	14.9
Up to 2x Federal Poverty Level	19.3	819	22.1*	1,174	17.7*
More than 2x Federal Poverty Level	67.4	1,794	54.1*	3,789	67.4
Employment Status					
Employed full time	49.9	1,619	45.5*	3,660	60.5*
Employed part time	12.9	652	15.8*	930	13.1
Unemployed	4.0	469	12.8*	470	6.6*
Not in labor force	33.2	796	25.9*	1,001	19.8*

[a]Past year DSM-IV drug dependence or abuse.

[b]Past year DSM-IV alcohol dependence or abuse.

*****Proportion with drug or alcohol use disorder is significantly different from the total study population based on *t*-test and $p < 0.05$.

Table 2. Drug and alcohol misuse by disability: data from 2018-2019 NSDUH respondents age 18 years or older

	Total Population	Drug Use Disorder[a]		Alcohol Use Disorder[b]	
	Weighted %	Un-weighted n = 3,536	Weighted %	Un-weighted n = 6,061	Weighted %
Any Disability					
Yes	20.6	1,307	37.0*	1,590	25.4*
Disability Type					
None	79.4	2,229	63.0*	4,471	74.6*
Hearing limitation only	2.9	49	1.4*	97	1.8*
Vision limitation only	2.0	103	2.5	137	2.0
Cognitive limitation only	3.5	471	11.5*	587	7.8*
Mobility limitation only	3.3	43	1.9*	59	1.5*
Complex activity limitation only	0.9	81	2.1*	91	1.3
≥2 limitations	8.0	560	17.6*	619	11.0*

[a]Past year DSM-IV drug dependence or abuse.

[b]Past year DSM-IV alcohol dependence or abuse.

*****Proportion with drug or alcohol use disorder is significantly different from the total study population based on *t*-test and $p < 0.05$.

Table 3. Results of logistic regression models evaluating the strength of the association between disability and drug use disorder[a]: data from 2018-2019 NSDUH respondents age 18 years or older (n=83,439)

	Unweighted n	Model 1: Unadjusted	Model 2: Adjusted for Demographics[b]	Model 3: Adjusted for Demographic and Socioeconomic Characteristics[c]
		OR (95% CI)	OR (95% CI)	OR (95% CI)
Any Disability				
No	67,795	Ref	Ref	Ref
Yes	15,644	2.3 (2.0 – 2.5)	3.2 (3.0 – 3.6)	2.7 (2.5 – 3.0)
Disability Type				
None	67,795	Ref	Ref	Ref
Hearing limitation only	1,540	0.6 (0.4 – 1.0)	1.3 (0.8 – 2.1)	1.2 (0.7 – 2.0)
Vision limitation only	1,722	1.6 (1.2 – 2.2)	1.7 (1.3 – 2.3)	1.6 (1.2 – 2.1)
Cognitive limitation only	4,015	4.4 (3.7 – 5.3)	3.5 (2.9 – 4.2)	3.1 (2.6 – 3.6)
Mobility limitation only	1,647	0.7 (0.4 – 1.2)	2.0 (1.1 – 3.4)	1.6 (0.9 – 2.7)
Complex activity limitation only	959	2.9 (2.2 – 3.9)	2.6 (1.9 – 3.6)	2.2 (1.6 – 3.0)
≥2 limitations	5,761	2.9 (2.5 – 3.3)	4.7 (4.1 – 5.3)	3.7 (3.3 – 4.3)

[a]Past year DSM-IV drug dependence or abuse.

[b]Age, sex, race/ethnicity.

[c]Age, sex, race/ethnicity, marital status, education, employment, poverty.

Table 4. Results of logistic regression models evaluating the strength of the association between disability and alcohol use disorder[a]: data from 2018-2019 NSDUH respondents age 18 years or older (n=83,439)

	Unweighted n	Model 1: Unadjusted	Model 2: Adjusted for Demographics[b]	Model 3: Adjusted for Demographic and Socioeconomic Characteristics[c]
		OR (95% CI)	OR (95% CI)	OR (95% CI)
Any Disability				
No	67,795	Ref	Ref	Ref
Yes	15,644	1.3 (1.2 – 1.4)	1.7 (1.6 – 1.9)	1.8 (1.6 – 2.0)
Disability Type				
None	67,795	Ref	Ref	Ref
Hearing limitation only	1,540	0.6 (0.4 – 1.0)	1.0 (0.7 – 1.5)	1.0 (0.7 – 1.6)
Vision limitation only	1,722	1.1 (0.8 – 1.5)	1.2 (0.9 – 1.6)	1.2 (0.9 – 1.6)
Cognitive limitation only	4,015	2.5 (2.2 – 2.9)	2.3 (2.0 – 2.6)	2.2 (1.9 – 2.5)
Mobility limitation only	1,647	0.5 (0.3 – 0.7)	0.9 (0.6 – 1.3)	0.9 (0.6 – 1.4)
Complex activity limitation only	959	1.5 (1.0 – 2.3)	1.5 (1.0 – 2.3)	1.5 (1.0 – 2.4)
≥2 limitations	5,761	1.5 (1.3 – 1.7)	2.1 (1.9 – 2.4)	2.3 (2.0 – 2.6)

[a]Past year DSM-IV alcohol dependence or abuse.

[b]Age, sex, race/ethnicity.

[c]Age, sex, race/ethnicity, marital status, education, employment, poverty.