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Substance use and misuse patterns and disability status in the 2020 US National Alcohol Survey: A contributing role for chronic pain

Sharon Reif, PhD[1,*],

Katherine J. Karriker-Jaffe, PhD[2],

Anne Valentine, MPH[3],

Deidre Patterson, MPH[4],

Amy A. Mericle, PhD[4],

Rachel Sayko Adams, PhD, MPH[1,5],

Thomas K. Greenfield, PhD[4]

[1]Brandeis University, Heller School for Social Policy & Management, Institute for Behavioral Health

[2]RTI International

[3]Brandeis University, Heller School for Social Policy & Management, Lurie Institute for Disability Policy

[4]Public Health Institute, Alcohol Research Group

[5]Rocky Mountain Mental Illness Research Education and Clinical Center, Veterans Health Administration

Abstract

Background: Evidence about substance use and misuse among adults with disabilities is still emerging, despite increased risk of chronic pain and mental health problems, which are in turn risk factors for substance use and misuse.

Objective: We examined substance use and misuse among adults with selected self-reported disability (versus without), controlling for sociodemographics, depression/anxiety, physical health, and chronic pain, and assessed whether associations could be attributed to chronic pain.

[*]Corresponding author: Sharon Reif, PhD; reif@brandeis.edu; 781-836-3924.

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Conflicts of Interest: We report no conflicts of interest.

Methods: Data are from the nationally representative 2020 US National Alcohol Survey. Disability indicators included sensory or mobility impairment, receiving Medicare before age 65, and/or unemployment due to disability. Regression analyses determined associations of disability with past-year substance use and misuse. Mediation analyses examined the role of chronic pain.

Results: Approximately 18% met 1+ disability criterion, representing 42.8 million adults. Disability was associated with reduced odds of current drinking (OR=0.77, p<0.01), but greater odds of daily nicotine use (OR=1.43, p<0.01), any drug use (OR=1.32 p<.01), prescription drug misuse (OR=1.99, p<0.001), and other drug use (OR=2.02, p<0.001). Disability was not associated with high-intensity drinking or marijuana use. Chronic pain accounted for 17–38% of the association between disability and nicotine use, any drug use, prescription drug misuse, and other drug use.

Conclusions: Findings indicated higher rates of substance use and misuse among people with disabilities, accounting for depression/anxiety, physical health and chronic pain, with pain being a significant mediator. Substance use screening, brief intervention, and treatment should include appropriate accommodations for disabilities, inclusive of comprehensive pain management options.

Keywords

disability; pain; alcohol; drugs; nicotine

Introduction

Recent prevalence data (2019) estimate one in four US adults lives with a disability.[1] People with disabilities (PWD) may experience significant medical and health challenges that adversely impact their economic and educational opportunities, sense of well-being and personal adjustment, functional capacities and full participation in society.[2–4] Research suggests adults with disabilities have increased risk for substance use and substance use disorders (SUD) compared with adults without disabilities,[5–8] although studies have been limited in size and relied on selected (e.g., clinical) populations. The complex interplay of social, economic and health determinants associated with disability make it challenging to parse out factors associated with disabling conditions and with increased risk of SUD among PWD.[9]

Substance use may contribute to development of certain disabilities and worsening of symptoms. Smoking, for example, is causally associated with stroke and multiple sclerosis[10,11] and worsening of disability,[10] and is itself a significant contributor to a number of disabling conditions.[12] Globally, alcohol is the 7th leading risk factor for disability and death, contributing to disabling conditions and a factor in accidents that can lead to disability.[13] Prevalence of alcohol intoxication at the time of traumatic brain injury may be as high as 50%.[14]

Population-based data examining the intersection of disability and substance use and SUD are limited, but a growing body of literature suggests that PWD experience higher rates of both than people without disabilities.[5,9,15] In the National Survey of Drug Use and Health

(NSDUH) from 2002–2010, for each substance examined, PWD reported a significantly higher rate of use than adults without disabilities, with the exception of alcohol; PWD were less likely to report binge drinking (5 or more drinks in one sitting) in the past month than respondents with no self-reported disability.[5]

A substantial body of research addresses associations between disability and psychological distress,[6,16] psychiatric disorders,[17,18] lifetime trauma and post-traumatic stress disorder (PTSD),[19] and quality of life.[2] Psychological distress, trauma and PTSD are in turn associated with higher rates of substance use and SUD.[6,17] Further, PWD may use substances such as alcohol and marijuana in attempts to self-medicate for both psychological distress and pain.[20] Effective treatments are available for these symptoms, but inadequate management and/or barriers to accessing formal treatments (e.g., cost, accessibility or preferences) might drive self-medication.

Studies have shown evidence for medical marijuana use to address pain,[21] which accompanies many disabling conditions.[22,23] The high prevalence of chronic pain in concert with legitimate access to prescription opioids among PWDs has garnered attention.[24] A recent study using NSDUH data found PWD to be more likely to misuse prescription opioid medication than adults without disabilities.[24] However, PWD who receive more prescription opioids have more opportunity to misuse, especially if pain is not sufficiently managed. In a follow-up study, once adjusted for differential likelihood of having an opioid prescription (i.e., due to higher prevalence of painful conditions among PWD), PWD were no more likely to have a prescription opioid use disorder than adults without disabilities.[25]

Given the intertwined nature of many types of substance use and disability, it is important to examine the overlap in the general population in the context of additional clinical characteristics such as mental health conditions and chronic pain. Using a nationally representative household survey conducted in 2019–2020, we examined alcohol and drug use behaviors among adults with selected self-reported disability indicators compared to adults without disabilities, controlling for sociodemographics and self-reported depression/anxiety, physical health, quality of life and chronic pain. We further explored whether associations of disability status with substance use were attributed, at least in part, to chronic pain.

Methods

Dataset

Data are from the 2020 National Alcohol Survey (NAS). The NAS is a long-running series of surveys of the US adult population conducted by the Public Health Institute's Alcohol Research Group every 5 years since the 1960s. The 2020 NAS was conducted between February 2019 and April 2020 using telephone and web surveys (N=9,668).[26] The telephone sample (n=1,572) used list-assisted, random digit dial (RDD) sampling of cellular phone numbers to conduct computer-assisted telephone interviews (CATI) to survey the US non-institutionalized population aged 18 or older. The web sample used two methods: a population-representative sample recruited through address-based sampling (ABS; n=5,661) and a non-probability sample recruited in collaboration with an existing research-focused

web panel (n=2,435), both using computer-assisted web interviews. Interviews/surveys were conducted in English and Spanish. The NAS oversampled Black respondents (n=2,023) and Latino respondents (n=1,831). Participants received Amazon.com gift codes ($15 if in main CATI sample; $25 if in one of the CATI oversamples; $20 if in ABS sample) for completing the survey. All procedures were reviewed by the Institutional Review Boards of the Public Health Institute (Oakland, CA) and ICF Macro (Fairfax, VA).

By design, a random half of CATI sample respondents (n=797) were asked the primary disability items, and some respondents did not answer all questions, resulting in a maximum analytic sample of 9,036. Analytic weights were used to adjust for survey design, sampling, probability of selection, likelihood of attrition, and survey mode. Post-stratification raking adjustments were applied to the weights to achieve US representativeness, with trimming to constrain extreme values in the final weights.

Measures

Current drinking was defined as having one or more drink of any kind of alcoholic beverage (including wine, beer, or liquor) in the past 12 months. Current drinkers were asked a series of graduated frequency questions.[27] After a 12-month "maximum number of drinks" question,[28] respondents were asked the frequency of each level of drinking, such as, "During the last 12 months, how often did you have 12 or more drinks of any kind alcoholic beverage in a single day?" The question was repeated for 8–11 drinks, 5–7 drinks, 3–4 drinks, 2 drinks and 1 drink. Categorical responses were converted into days per year using category midpoints. ***High-intensity drinking*** was then calculated as the number of days of drinking 8+ drinks on a given day in the past 12 months; it was dichotomized (0 vs. 1 or more days) for analyses. ***Drinking that exceeds NIAAA guidelines*** relied on at-risk drinking definitions from the National Institute on Alcohol Abuse and Alcoholism (NIAAA): more than 3 drinks on any day or 7 drinks per week on average for women and more than 4 drinks on any day or 14 drinks per week on average for men during the past 12 months.[29]

Daily ***nicotine use*** was based on response of "daily or nearly daily" to either of two items: "How often have you smoked tobacco cigarettes or used any other kinds of tobacco in the past 12 months?" and "How often have you used e-cigarettes in the past 12 months?"

Any drug use was coded as never vs. any drug use in the past year, based on any marijuana use, any prescription drug misuse or any other drug use (as follows).

Marijuana use was assessed with the item: "How often have you used marijuana, hashish, pot, THC or "weed" during the last 12 months?" (coded as never vs. any use in the past year). In some states and thus for some respondents, marijuana is legal for recreational use; the NAS does not distinguish this.

Prescription drug misuse was based on the overall item: "The next questions ask about using prescription drugs in any way a doctor did not direct you to use them. This includes: using them without a prescription of your own; using them in greater amounts, more often, or longer than you were told to take them; or using them in any other way a doctor did not direct you to use them." Responses were obtained for three types of medications, in the past

12 months: “a prescription pain reliever such as Codeine, Percodan, Vicodin, OxyContin, or Methadone,” “any prescription stimulants or uppers such as amphetamines, Ritalin, or Adderall,” and “prescription tranquilizers like benzodiazepines, Xanax, Ativan, Klonopin, or Valium or sedatives like barbiturates, Ambien, ‘zapams or phenobarbital.” Responses were dichotomized as “never” versus any use in the past year.

Other drug use was measured by similarly dichotomizing responses to the item “how often have you used any other drugs for recreational purposes?” (coded as never vs. any use in the past year).

Disability was assessed with two primary items: “Are you deaf or blind or do you have serious difficulty hearing or seeing (even when wearing glasses)?” and “do you have serious difficulty walking or climbing stairs?” Additional disability indicators included a response of “disabled” to the question “what is your work situation” and having Medicare as health insurance when under age 65. A dichotomous variable indicated a self-reported disability based on an affirmative response to at least one of these 4 indicators. Sensitivity analyses assessed robustness of findings when omitting the work criterion from the disability indicator; results were essentially the same (data not shown).

Clinical characteristics included self-reported measures of pain, depression/anxiety, self-rated health, and quality of life. Chronic pain was measured by asking respondents “Do you suffer from any type of chronic pain that occurs constantly or flares up frequently?” Recency information was collected for those who reported chronic pain (“In the past 12 months, have you seen or talked to a doctor about your pain?”). An indicator of depression and/or anxiety symptoms in the prior two weeks was based on the Patient Health Questionnaire (PHQ-4),[30] which screens for depression and anxiety using diagnostic core criteria (dichotomized as positive versus neither depression nor anxiety) but does not assure meeting clinical depression and anxiety diagnostic criteria. A single-item self-rated health measure was dichotomized into poor or fair health versus excellent, very good, or good; a single-item measure of quality of life was similarly coded.

Sociodemographics included age (years, continuous); marital status (separated/divorced/widowed or never married, with married/cohabitating as referent); education (high school or less/some college, with college degree or more as referent); employment (unemployed/retired/other as referent); income (less than $20,000, $20,001–40,000, $40,001–60,000, $60,001–100,000, with greater than $100,001 as referent), sex (female as referent); and race/ethnicity (with indicators for Black/African American; Hispanic/Latinx; Asian/Pacific Islander and all others; using White/Caucasian as referent). Analyses also adjusted for survey sample (indicators for CATI or web panel, with ABS as referent).

Statistical analyses

All analyses were performed using Stata (version 16.1),[31] using sample weights to adjust for sampling design. We conducted descriptive statistics (frequencies and percentages for categorical variables and means and standard deviations (SD) for continuous variables). Differences between groups were compared using overall design-adjusted multiple degrees of freedom F-tests or analysis of variance (ANOVA) as appropriate. We conducted

unadjusted logistic regressions to determine the association of disability status and the substance use variable. We next estimated a series of models progressively adjusting for additional covariates, culminating in a model including demographics, self-rated depression/anxiety, physical health, quality of life, and chronic pain. Odds ratios (ORs) and corresponding 95% confidence intervals (CIs) were reported to quantify relationships. A similar approach was used to model chronic pain.

To test whether the relationship between the substance use variables and disability was accounted for by chronic pain, we conducted a set of fully-adjusted cross-sectional mediation analyses using Stata's 'medeff' module.[32] The module provides the association between the independent variable (disability status) and each type of substance use, separately, and calculates an indirect effect via the hypothesized explanatory variable (chronic pain). We present the proportion of the total effect that was accounted for by chronic pain for each outcome, accounting for all covariates, including the clinical characteristics.

Results

Approximately 18% of the sample met at least one disability criterion (Table 1). This represents an estimated 42.8 million adults with a self-reported disability. Among those with a disability, over half (52%) reported serious difficulty walking or climbing stairs, nearly one-third reported being deaf or blind (31%) or unemployed due to a disability (32%), or met disability criteria by being on Medicare when less than age 65 (30%) (conditions not mutually exclusive).

Demographic and clinical characteristics were related to disability status (Table 2). Compared to adults with no reported disabilities, those meeting disability criteria were older (mean age = 53.8 vs 46.2 years, $p<0.001$). Although there were no differences by gender, disability status varied by race/ethnicity (higher among Black/African American adults), marital status, employment, and income. Compared to those with no reported disability, respondents meeting disability criteria had lower rates of having a college degree (17.3% vs. 34.5%, $p<0.001$), being married (47.5% vs. 59.7%, $p<.001$), or working full or part-time (28.7% vs. 65.6%, $p<0.001$). They also were more likely to report their general health status and their quality of life as only fair or poor (36.3% vs. 8.4%, $p<.001$ and 27.9% vs. 7.6%, $p<.001$, respectively), and were more likely to meet criteria for current depression/anxiety (29.4% vs 17.0%, $p <0.001$). Further, a greater percentage of those with a disability suffered from chronic pain (62.3% vs 24.8%, $p<0.001$), and a majority of those with a disability and chronic pain had talked with a doctor about their pain in the past year (87.1% vs. 72.5% without a disability, $p<0.001$).

Disability status was negatively associated with drinking status (Table 2), with a greater proportion of people with a disability reporting that they do not drink (37.3% vs. 25.6%, $p<.001$) compared to those with no reported disability, and a lower proportion of people with disability reported at-risk drinking that exceeds NIAAA guidelines (23.0% vs. 31.7%, $p<.001$). However, among drinkers, those with a disability had more days per year with high-intensity drinking (eight+ drinks in one day) (19.7 vs 7.5 days, $p<0.001$). Additionally,

a greater percentage of people with a disability reported daily nicotine use (32.2% vs 15.9%, p<0.001), any drug use (29.7% vs. 21.5%, p<.001), prescription drug misuse (15.5% vs 6.7%, p<0.001) and other drug use (8.6% vs 4.9%, p<0.001). Among past-year marijuana users, people with disabilities were more likely to report a recommendation from a doctor for medical marijuana (29.8% vs. 14.4%, p<.001).

Adjusting for demographics, clinical characteristics, and chronic pain (Model 4 in Tables 3 and 4), disability status was associated with significantly reduced odds of being a drinker (OR=0.77, p<0.01), and greater odds of daily nicotine use (OR=1.43, p<0.01). Disability also was associated with any drug use (OR=1.32, p<.01), prescription drug misuse (OR=1.99, p<0.001), and other drug use (OR=2.02, p=0.001). Disability status was not associated with high-intensity drinking (OR=1.24, p>.10) or marijuana use (OR=1.09, p>.10) in the fully-adjusted model.

Respondents suffering from chronic pain were significantly more likely to be drinkers (OR=1.34, p<.001) and to report daily nicotine use (OR=1.67, p<.001), any drug use (OR=1.86, p<.001), marijuana use (OR=1.57, p<.001), prescription drug misuse (OR=2.28, p<.001), or other drug use (OR=1.61, p<.01). Chronic pain was not significantly associated with high-intensity drinking. Accounting for both disability status and chronic pain, depression/anxiety was significantly associated with high-intensity drinking by past-year drinkers (OR=1.72, p<.001), and increased odds of daily nicotine use (OR=1.31, p<.05), any drug use (OR=1.67, p<.001), marijuana use (OR=1.72, p<.001), prescription drug misuse (OR=1.87, p<.001), and other drug use (OR=2.40, p<.001). People with poor physical health were significantly less likely to be drinkers (OR=.62, p<.001), and people with reduced quality of life were significantly more likely to use nicotine daily (OR=1.48, p<.05).

Mediation Analyses

Our final analyses examined how much of the relationship between disability status and substance use was explained by chronic pain. Accounting for the same set of covariates, disability was associated with significantly increased odds of chronic pain (OR=3.42, p<.001) (Table 5). Depression/anxiety (OR=1.77, p<.001), poor physical health (OR=2.83, p<.001), and reduced quality of life (OR=1.78, p<.001) also were significantly associated with chronic pain.

The mediation analysis (Table 6) showed that chronic pain accounted for 17–38% of the association between disability and substance use, with the proportion of the explained effect highest for any drug use, and lower for other drug use than for daily nicotine use or prescription drug misuse. Drinking outcomes and marijuana use are omitted. Disability was associated with reduced odds of being a drinker, but chronic pain was associated with increased odds of being a drinker (Table 3); thus, mediation by chronic pain was not logically possible. We did not calculate a mediated effect for high-intensity drinking or marijuana use, because disability was not consistently associated with increased odds of use (Tables 3 and 4).

Discussion

Our findings, based on nationally representative data, show that disability was associated with lower odds of being a current drinker, after adjustment for demographic characteristics and self-reported depression/anxiety, physical health and quality of life in this non-institutionalized household sample of adults. This could be related to medical advice (e.g., contraindications due to medication interactions) or limited access to alcohol outlets or establishments by people with disabilities. However, among drinkers, descriptive analyses showed that disability was associated with more days of having 8 or more drinks on a single day, suggesting that high-intensity drinking is a concern that merits intervention.

Disability was also associated with higher odds of daily nicotine use, any past-year drug use, prescription drug misuse, and other drug use when adjusting for sociodemographic, clinical, physical and mental health characteristics. It was not associated with past-year marijuana use or high-intensity drinking. These findings support estimates from other studies,[5,7,9,24] yet advance our knowledge given the comprehensive set of covariates and the use of a recent nationally representative sample. For the first time, we report that chronic pain is a likely mediator in the disability-substance use relationship, accounting for 38% of the total effect for any drug use, over 27% of the total effect for daily nicotine use and prescription drug misuse, and about 17% of the total effect for other drug use.

The self-medication hypothesis[20] would suggest people with disabilities are using alcohol and drugs to address unmanaged pain, psychological distress, or poor quality of life. Depression/anxiety and chronic pain were each significantly associated with increased likelihood of nearly all substance use measures in the fully-adjusted models including disability, further supporting this self-medication concept. However, even when controlling for these variables, people who met disability criteria still had increased usage of all drugs except marijuana.

More broadly, the higher rates of substance use and misuse by people with disability are of concern. Alcohol and nicotine use can be risk factors for disability itself and for increased symptomology among people with disabilities.[10,12,13] They also are contraindicated for certain medications or treatment regimens. It is essential, therefore, to screen people with disabilities for substance use and SUD. Screening, brief intervention, and referral to treatment (SBIRT) approaches have demonstrated success in identifying risky substance use, counseling individuals to reduce their risky use, and if needed, referring to specialty substance use treatment; for smoking, Ask/Advise models have long been in use.[12] Even brief interventions can lead to reductions in substance use or quit attempts.[12,33]

Particularly for people with frequent high-intensity drinking or those using illicit drugs, specialty SUD treatment may be needed. While co-occurring disability, substance use and SUD affect millions of individuals in the US,[5] enhancing accessibility to SUD treatment and addressing the treatment needs of this varied, diverse population has proven challenging.[8] Despite regulations under the Americans with Disabilities Act, many substance use treatment programs and informal treatment such as mutual help (e.g., Alcoholics Anonymous) remain physically inaccessible or lack other accommodations.[34]

Further, to our knowledge, no treatment locator websites (e.g., the Substance Abuse and Mental Health Services Administration (SAMHSA), individual states) indicate accessibility overall or for types of disabling conditions, although SAMHSA has offered guidance for treatment programs.[35] It is essential for efforts to continue that ensure that specialty SUD treatment is available and accessible for people with disabilities.

Depression/anxiety results suggest psychological distress is an important component of substance use, even when accounting for disability and chronic pain. The need to consider mental health as a key factor is paramount when addressing risky substance use among people with and without disabilities.[6] Accessibility issues are also a concern for mental health treatment, as are long-standing siloes across the care systems of these various conditions, despite some improvement.

We found chronic pain was a significant contributor to substance use among people with disabilities. In particular, the association with past-year prescription drug misuse and marijuana use may indicate pain that is not adequately managed. Pain management has been described in a human rights framework,[36] and people with disabilities and pain may experience increased barriers to obtaining pain medications and refills. Yet with the long-standing focus on the opioid crisis, the management of pain has taken a back seat to the management of opioid prescribing.[36,37] Because management of chronic pain with long-term opioids may not be the right approach in many instances due to risks for development of dependence,[38] the need for non-pharmacological pain management approaches remains essential. Our findings that chronic pain was not a mediator for high-intensity drinking are consistent with analyses in a military sample.[39]

Our findings highlight the need for additional research. We could not examine the quantity or frequency of most types of substances. Future research would help us to better understand the increased amount of high-intensity drinking among people with disabilities, and assess if similar differences occur for other substances. It is important to delve into variations by type of disability, level of impairment or functioning, or other factors (e.g., social isolation), which may reveal opportunities for targeted prevention and intervention. A better understanding of marijuana used for recreational versus medicinal purposes would also be valuable, in the context of the interaction of disability and pain. Qualitative research would provide additional insight into the reasons for higher rates of most substance use as well as the relationship with chronic pain.

Limitations

While this study advances our knowledge about the interconnections of disability, substance use, and chronic pain, there are some limitations. First, the definition of disability has evolved over time, presenting challenges for estimating the prevalence of substance use and SUD among PWD. The NAS used only two items (deaf or blind, trouble walking or climbing stairs) from a standard 6-question disability assessment[40] and thus may underestimate disability. However, the NAS also allowed self-identification via other standardized indicators including unemployment due to a disability and receiving Medicare when under age 65. Although SUD is not an allowable criterion for receiving

SSDI and Medicare, SUD may be causally related to the disabilities that do meet eligibility criteria. Our population estimate of disability (18%) is slightly lower than other population estimates.[41] Differences in the questions or methods by which disability status is ascertained, survey methodologies, and sampling strategies may result in discrepancies in substance use prevalence estimates across studies. These results merit replication in future research. These data did not allow examination of specific types of disability which would allow deeper understanding of the relationship between disability, substance use and pain.

The NAS is a household survey that excludes institutionalized populations who have higher rates of disability. Further, the data rely on accurate self-report. Generally, the key concern with self-report of substance use is underestimation, yet these associations are robust. Self-report of disability might overestimate the disabling nature of transient conditions, yet our population estimates of disability were slightly lower than expected. Pain is a subjective condition, thus self-report is standard, although more nuanced approaches are used to assess pain and chronicity in clinical settings. Our “use” measures are dichotomous and do not account for variations in quantity, frequency or length of substance use. The time period for these data overlap with public health efforts to reduce prescription opioid use and e-cigarette use, which may lead to lower estimates compared to prior years. Lastly, these analyses are cross-sectional, so cannot address the temporal role of disability, substance use and chronic pain.

Conclusion

Our nationally representative findings indicate generally higher rates of risky substance use among people with disabilities, even when adjusting for demographics, depression/anxiety physical health, quality of life, and chronic pain. Chronic pain accounted for a significant proportion of the total effect in most models, other than the alcohol outcomes. We highlight the need for substance use and SUD screening and brief intervention, substance use treatment programs that are broadly accessible and offer accommodations for people with a range of disabilities, and comprehensive pain management approaches.

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REFERENCES

1. Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities, Division of Human Development and Disability. Disability and Health Data System (DHDS) Data [online] n.d.; https://dhds.cdc.gov. Accessed June 15, 2021.
2. Froehlich-Grobe K, Jones D, Businelle MS, Kendzor DE, Balasubramanian BA. Impact of disability and chronic conditions on health. Disabil Health J 2016;9(4):600–608. [PubMed: 27216441]
3. Shandra CL. Disability as inequality: Social disparities, health disparities, and participation in daily activities. Social Forces 2018;97(1):157–192.
4. World Health Organization. International Classification of Functioning, Disability, and Health (ICF) Geneva: WHO;2001.

5. Glazier RE, Kling RN. Recent trends in substance abuse among persons with disabilities compared to that of persons without disabilities. Disabil Health J 2013;6(2):107–115. [PubMed: 23507161]
6. Walker ER, Druss BG. Cumulative burden of comorbid mental disorders, substance use disorders, chronic medical conditions, and poverty on health among adults in the U.S.A. Psychol Health Med 2017;22(6):727–735. [PubMed: 27593083]
7. Smedema SM, Ebener D. Substance abuse and psychosocial adaptation to physical disability: analysis of the literature and future directions. Disabil Rehabil 2010;32(16):1311–1319. [PubMed: 20156048]
8. Novotna G, Johner R, McCarron M, et al. Assessment and treatment for persons with coexisting ability and substance use issues: A review and analysis of the literature. J Soc Work Dis Rehab 2017;16(2):141–160.
9. Brucker D Estimating the prevalence of substance use, abuse, and dependence among Social Security Disability benefit recipients. J Dis Policy Stud 2007;18(3):148–159.
10. Heydarpour P, Manouchehrinia A, Beiki O, et al. Smoking and worsening disability in multiple sclerosis: A meta-analysis. Acta Neurol Scand 2018;138(1):62–69. [PubMed: 29542102]
11. Markidan J, Cole JW, Cronin CA, et al. Smoking and risk of ischemic stroke in young men. Stroke 2018;49(5):1276–1278. [PubMed: 29674522]
12. U.S. Department of Health and Human Services. Smoking Cessation. A Report of the Surgeon General Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health;2020.
13. GBD 2016 Alcohol Collaborators. Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 2018;392(10152):1015–1035. [PubMed: 30146330]
14. Parry-Jones BL, Vaughan FL, Miles Cox W. Traumatic brain injury and substance misuse: a systematic review of prevalence and outcomes research (1994–2004). Neuropsychol Rehabil 2006;16(5):537–560. [PubMed: 16952892]
15. Lin E, Balogh R, McGarry C, et al. Substance-related and addictive disorders among adults with intellectual and developmental disabilities (IDD): an Ontario population cohort study. BMJ Open 2016;6(9):e011638.
16. Okoro CA, Strine TW, Balluz LS, et al. Serious psychological distress among adults with and without disabilities. Int J Public Health 2009;54 Suppl 1:52–60. [PubMed: 19363587]
17. Anderson ML, Ziedonis DM, Najavits LM. Posttraumatic stress disorder and substance use disorder comorbidity among individuals with physical disabilities: findings from the National Comorbidity Survey Replication. J Trauma Stress 2014;27(2):182–191. [PubMed: 24659557]
18. Sareen J, Cox BJ, Clara I, Asmundson GJ. The relationship between anxiety disorders and physical disorders in the U.S. National Comorbidity Survey. Depress Anxiety 2005;21(4):193–202. [PubMed: 16075453]
19. Gilson SF, Chilcoat HD, Stapleton JM. Illicit drug use by persons with disabilities: insights from the National Household Survey on Drug Abuse. Am J Public Health 1996;86(11):1613–1615. [PubMed: 8916529]
20. Alford DP, German JS, Samet JH, Cheng DM, Lloyd-Travaglini CA, Saitz R. Primary care patients with drug use report chronic pain and self-medicate with alcohol and other drugs. J Gen Intern Med 2016;31(5):486–491. [PubMed: 26809204]
21. Stetten N, Pomeranz J, Moorhouse M, Yurasek A, Blue AV. The level of evidence of medical marijuana use for treating disabilities: a scoping review. Disabil Rehabil 2020;42(9):1190–1201. [PubMed: 30456993]
22. Ehde DM, Jensen MP, Engel JM, Turner JA, Hoffman AJ, Cardenas DD. Chronic pain secondary to disability: a review. The Clinical Journal of Pain 2003;19(1):3–17. [PubMed: 12514452]
23. Kennedy J, Roll JM, Schraudner T, Murphy S, McPherson S. Prevalence of persistent pain in the U.S. adult population: new data from the 2010 National Health Interview Survey. J Pain 2014;15(10):979–984. [PubMed: 25267013]

24. Lauer EA, Henly M, Brucker DL. Prescription opioid behaviors among adults with and without disabilities - United States, 2015–2016. Disabil Health J 2019;12(3):519–522. [PubMed: 30594480]
25. Reif S, Lauer EA, Adams RS, Brucker DL, Ritter GA, Mitra M. Examining differences in prescription opioid use behaviors among U.S. adults with and without disabilities under review.
26. ICF. National Alcohol Survey Cycle 14: Methodology Report Fairfax, VA: ICF;2020.
27. Greenfield TK. Ways of measuring drinking patterns and the difference they make: experience with graduated frequencies. J Subst Abuse 2000;12(1–2):33–49. [PubMed: 11288473]
28. Greenfield TK, Nayak MB, Bond J, Ye Y, Midanik LT. Maximum quantity consumed and alcohol-related problems: assessing the most alcohol drunk with two measures. Alcohol Clin Exp Res 2006;30(9):1576–1582. [PubMed: 16930220]
29. National Institute on Alcohol Abuse and Alcoholism. Rethinking drinking: alcohol and your health n.d.; https://www.rethinkingdrinking.niaaa.nih.gov Accessed February 27, 2021.
30. Kroenke K, Spitzer RL, Williams JB, Lowe B. An ultra-brief screening scale for anxiety and depression: the PHQ-4. Psychosomatics 2009;50(6):613–621. [PubMed: 19996233]
31. StataCorp. Stata Statistical Software: Release 16 College Station, TX: StataCorp LLC; 2019.
32. Hicks R, Tingley D. Causal mediation analysis. Stata J 2011;11:1–15.
33. Kaner EF, Beyer FR, Muirhead C, et al. Effectiveness of brief alcohol interventions in primary care populations. Cochrane Database Syst Rev 2018;2:CD004148. [PubMed: 29476653]
34. West SL. The accessibility of substance abuse treatment facilities in the United States for persons with disabilities. J Subst Abuse Treat 2007;33(1):1–5. [PubMed: 17499956]
35. Substance Abuse and Mental Health Services Administration. TIP 29: Substance Use Disorder Treatment for People With Physical and Cognitive Disabilities Rockville, MD: SAMHSA/Center for Substance Abuse Treatment;2012.
36. Brennan F, Lohman D, Gwyther L. Access to pain management as a human right. Am J Public Health 2019;109(1):61–65. [PubMed: 32941757]
37. Meara E, Horwitz JR, Powell W, et al. State Legal Restrictions and Prescription-Opioid Use among Disabled Adults. N Engl J Med 2016;375(1):44–53. [PubMed: 27332619]
38. Volkow ND, McLellan AT, Longo DL. Opioid abuse in chronic pain — misconceptions and mitigation strategies. New Engl J Med 2016;374:1253–1263. [PubMed: 27028915]
39. Reif S, Adams RS, Ritter GA, Larson MJ. Exploration of the association of selected pain diagnoses with risky alcohol use among active duty soldiers. Subst Abus 2020;41(4):456–462. [PubMed: 31638881]
40. Office of the Assistant Secretary for Planning and Evaluation. HHS Implementation Guidance on Data Collection Standards for Race, Ethnicity, Sex, Primary Language, and Disability Status [Internet] 2015; https://aspe.hhs.gov/pdf-report/hhs-implementation-guidance-data-collection-standards-race-ethnicity-sex-primary-language-and-disability-status. Accessed Oct 22, 2019.
41. Okoro CA, Hollis ND, Cyrus AC, Griffin-Blake S. Prevalence of disabilities and health care access by disability status and type among adults - United States, 2016. MMWR Morb Mortal Wkly Rep 2018;67(32):882–887. [PubMed: 30114005]

Table 1.

Prevalence of Disability Indicators in Full and Disability Analysis Samples

	Unweighted			Population-Weighted		
	Sample n	**Full Sample %**	**Disability Sample %**	**Weighted n**	**Full Sample %**	**Disability Sample %**
Has disability (1+ disability indicator) [a]	1,628	18.0	100	42,755,723	19.0	100
Deaf or blind	485	5.8	31.2	12,703,972	6.1	31.3
Serious difficulty walking or climbing stairs	817	9.8	52.3	21,115,918	10.1	51.7
<65 years old & on Medicare	487	5.4	29.9	12,869,370	5.7	30.1
Unemployed due to disability	520	5.8	32.0	14,546,723	6.5	34.1

Note. Data come from the 2020 National Alcohol Survey (N=9,036).

[a]Disability indicators are not mutually exclusive.

Table 2:

Weighted Prevalence of Sociodemographic and Clinical Variables, by Disability Status

	Disability (n=1,628)	No reported disabilities (n=7,408)
Age (mean, SD)	53.8 (17.92)	46.2 (17.55) ***
Female (%)	54.8	51.2
Race/Ethnicity (%)		***
White	63.5	65.3
Black/African American	16.0	12.0
Hispanic/Latinx	14.6	14.5
Other	5.9	8.1
Education (%)		***
High school or less	44.8	28.7
Some college	38.0	36.9
College degree	17.3	34.5
Marital Status (%)		***
Married/cohabitating	47.5	59.7
Divorced/widowed/separated	34.0	18.8
Single	18.5	21.5
Employment (%)		***
Full or part-time	28.7	65.6
Unemployed/retired/other	71.3	34.4
Income (%)		***
< $20 000	37.7	14.3
$20 001–40 000	23.2	20.1
$40 001–60 000	18.9	23.0
$60 001–100 000	11.8	20.4
> $100 001	8.3	22.1
General Health Status (%)		***
Excellent/very good/good	63.7	91.6
Fair/poor	36.3	8.4
Quality of Life (%)		***
Excellent/very good/good	72.1	92.4
Fair/poor	27.9	7.6
Chronic Pain (%)	62.3	24.8 ***
Talked about Pain with Doctor in past year [a] **(%)**	87.1	72.5 ***
Depression/Anxiety in past 2 weeks (%)	29.4	17.0 ***
Sample Source		**
CATI	15.4	16.1
ABS web survey	56.1	60.7
Non-probability panel [b]	28.5	23.3

	Disability (n=1,628)	No reported disabilities (n=7,408)
Drinking status (%)		***
Non-drinker	37.3	25.6
Drinker, doesn't exceed NIAAA guidelines [b]	39.7	42.7
At-risk drinker, exceeds NIAAA guidelines [b]	23.0	31.7
Any past year high-intensity drinking (%) [c]	13.8	13.5
Past year high-intensity drinking days (Mean, SD) [c]	19.7 (73.1)	7.5(40.0) ***
Daily nicotine use (%)	32.3	15.9 ***
Any drug use (%) [d]	29.7	21.5 ***
Past year marijuana use (%)	19.8	17.6
Past year prescription drug misuse (%)	15.5	6.7 ***
Past year other drug use (%)	8.6	4.9 ***
Medical cannabis recommendation (%) [e]	29.8	14.4 ***

[a] Among those reporting chronic pain.

[b] Drinking guidelines = no more than 3 drinks on any day or more than 7 drinks per week on average for women and no more than 4 drinks on any day or more than 14 drinks per week on average for men during the past 12 months (National Institute on Alcohol Abuse and Alcoholism).

[c] High-intensity drinking = days drinking 8+ drinks; among drinkers only.

[d] Any marijuana use, prescription drug misuse, or other drug use.

[e] Among those reporting past-year marijuana use.

Significance levels for design-based F-tests of differences in categorical variables by disability status:

*** p<0.001,

** p<0.01,

* p<0.05

Note. Data come from the 2020 National Alcohol Survey (N=9,036 observations). CATI = computer-assisted telephone interview. ABS = address-based sample. [b] Panel sample completed same web survey as ABS.

Table 3:

Unadjusted and Adjusted Models for Past-year Drinking and Nicotine Outcomes, by Disability Status

	Current Drinker		Any High-intensity Drinking Days [1]		Daily Nicotine Use	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Model 1: Unadjusted						
Disability	0.58***	(0.498 – 0.675)	0.97	(0.748 – 1.255)	2.53***	(2.093–3.052)
Model 2: Adjusted for demographics [a]						
Disability	0.81*	(0.685 – 0.963)	1.38*	(1.011 – 1.873)	1.95***	(1.552 – 2.439)
Model 3: Adjusted for demographics and clinical characteristics [b]						
Disability	0.83*	(0.699 – 0.997)	1.21	(0.873 – 1.689)	1.58***	(1.244 – 2.006)
Model 4: Adjusted for demographics, clinical characteristics and chronic pain [c]						
Disability	0.77**	(0.642 – 0.929)	1.24	(0.885 – 1.738)	1.43**	(1.116 – 1.832)
Age (continuous)	0.99*	(0.990 – 1.000)	0.97***	(0.959 – 0.975)	1.00	(0.990 – 1.004)
Male [d]	1.13+	(0.983 – 1.308)	2.73***	(2.207 – 3.380)	1.36**	(1.120 – 1.660)
Black/African American [e]	0.70***	(0.592 – 0.838)	0.50***	(0.358 – 0.694)	0.47***	(0.360 – 0.606)
Latino [e]	1.11	(0.916 – 1.342)	0.75+	(0.563 – 1.001)	0.39***	(0.287 – 0.519)
Asian [e]	0.82*	(0.673 – 0.996)	0.84	(0.638 – 1.117)	0.72*	(0.531 – 0.987)
High school or less [f]	0.60***	(0.501 – 0.727)	1.04	(0.755 – 1.439)	3.97***	(2.958 – 5.318)
Some college [f]	0.92	(0.778 – 1.087)	0.94	(0.722 – 1.230)	3.78***	(2.914 – 4.892)
Separated/Divorced/ Widowed [g]	1.00	(0.828 – 1.215)	0.81	(0.566 – 1.147)	1.25	(0.954 – 1.627)
Never married [g]	0.84+	(0.696 – 1.007)	1.00	(0.756 – 1.321)	0.81	(0.622 – 1.051)
Employed	1.58***	(1.356 – 1.840)	1.60**	(1.201 – 2.127)	1.12	(0.899 – 1.400)
Income < $20,000 [h]	0.61***	(0.464 – 0.795)	0.89	(0.583 – 1.367)	2.27***	(1.504 – 3.426)
Income $20,001–40,000 [h]	0.63***	(0.492 – 0.813)	0.90	(0.617 – 1.322)	1.80**	(1.214 – 2.662)
Income $40,001–60,000 [h]	0.77*	(0.614 – 0.977)	0.86	(0.607 – 1.208)	1.27	(0.868 – 1.860)
Income $60,001–100,000 [h]	1.01	(0.793 – 1.281)	0.73+	(0.516 – 1.022)	1.18	(0.799 – 1.732)
CATI [i]	0.92	(0.690 – 1.235)	1.01	(0.658 – 1.547)	1.45+	(0.996 – 2.122)
Web panel [i,j]	1.02	(0.870 – 1.204)	0.96	(0.737 – 1.240)	1.36**	(1.079 – 1.715)
Fair or poor self-rated health	0.62***	(0.491 – 0.790)	1.19	(0.778 – 1.827)	1.33+	(0.987 – 1.788)
Fair or poor quality of life	1.09	(0.837 – 1.407)	1.33	(0.908 – 1.941)	1.48*	(1.075 – 2.035)
Depression/anxiety in past 2 weeks	1.14	(0.940 – 1.370)	1.72***	(1.320 – 2.250)	1.31*	(1.019 – 1.671)
Chronic pain	1.34***	(1.141 – 1.574)	1.17	(0.915 – 1.503)	1.67***	(1.349 – 2.061)

[1] Models limited to current drinkers only.

[a] Models adjust for age, gender, race/ethnicity, education, marital status, employment, income, sample.

[b] Models adjust for age, gender, race/ethnicity, education, marital status, employment, income, sample, self-rated health, quality of life, and depression/anxiety in past year.

[c] Models adjust for age, gender, race/ethnicity, education, marital status, employment, income, sample, self-rated health, quality of life, depression/anxiety in past year, and chronic pain.

[d] Compared to females,

[e] Compared to Non-Hispanic White,

[f] Compared to College degree,

[g] Compared to Married,

[h] Compared to income >$100,001,

[i] Compared to ABS Sample

[j] Panel sample completed same web survey as ABS.

Logistic regression (Odds ratio [OR] and 95% confidence interval [CI]) models.

*** p<0.001,

** p<0.01,

* p<0.05

Note. Data come from the 2020 National Alcohol Survey. CATI = computer-assisted telephone interview. ABS = address-based sample (referent).

Table 4:

Unadjusted and Adjusted Models for Past-year Drug Use Outcomes, by Disability Status

	Any Drug Use [k]		Marijuana Use		Prescription Drug Misuse		Other Drug Use	
			OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Model 1: Unadjusted								
Disability	1.54***	(1.310 – 1.808)	1.15	(0.964–1.377)	2.55***	(2.033–3.187)	1.82***	(1.380–2.409)
Model 2: Adjusted for demographics [a]								
Disability	1.71***	(1.419 – 2.062)	1.34**	(1.087 – 1.663)	2.58***	(2.000 – 3.330)	2.42***	(1.763 – 3.329)
Model 3: Adjusted for demographics and clinical characteristics [b]								
Disability	1.51***	(1.240 – 1.844)	1.20	(0.959 – 1.505)	2.36***	(1.802 – 3.091)	2.21***	(1.617 – 3.033)
Model 4: Adjusted for demographics, clinical characteristics and chronic pain [c]								
Disability	1.32**	(1.074 – 1.615)	1.09	(0.864 – 1.377)	1.99***	(1.514 – 2.609)	2.02***	(1.460 – 2.791)
Age (continuous)	0.97***	(0.967 – 0.977)	0.96***	(0.958 – 0.970)	0.99+	(0.984 – 1.000)	0.96***	(0.948 – 0.968)
Male [d]	1.37***	(1.182 – 1.595)	1.51***	(1.283 – 1.774)	1.01	(0.801 – 1.281)	1.64***	(1.236 – 2.169)
Black/African American [e]	0.91	(0.750 – 1.098)	0.82+	(0.671 – 1.014)	0.98	(0.732 – 1.300)	0.56***	(0.407 – 0.776)
Latino [e]	0.95	(0.779 – 1.151)	0.89	(0.717 – 1.093)	1.18	(0.893 – 1.561)	0.93	(0.665 – 1.291)
Asian [e]	0.95	(0.776 – 1.162)	0.88	(0.704 – 1.091)	0.95	(0.692 – 1.292)	1.10	(0.790 – 1.520)
High school or less [f]	0.98	(0.803 – 1.200)	0.87	(0.698 – 1.083)	1.20	(0.874 – 1.658)	1.05	(0.714 – 1.536)
Some college [f]	0.95	(0.802 – 1.133)	0.95	(0.786 – 1.144)	0.91	(0.691 – 1.193)	0.82	(0.593 – 1.128)
Separated/Divorced/ Widowed [g]	1.32*	(1.058 – 1.634)	1.13	(0.882 – 1.439)	1.51**	(1.108 – 2.070)	1.36	(0.887 – 2.070)
Never married [g]	1.05	(0.866 – 1.272)	0.97	(0.788 – 1.189)	1.24	(0.922 – 1.657)	1.00	(0.717 – 1.402)
Employed	1.04	(0.877 – 1.234)	1.00	(0.827 – 1.206)	1.35*	(1.040 – 1.742)	1.70***	(1.249 – 2.304)
Income < $20,000 [h]	1.26	(0.955 – 1.668)	1.51**	(1.116 – 2.030)	0.86	(0.552 – 1.342)	1.43	(0.847 – 2.399)
Income $20,001–40,000 [h]	1.15	(0.890 – 1.495)	1.31+	(0.991 – 1.731)	1.02	(0.679 – 1.527)	1.05	(0.635 – 1.737)
Income $40,001–60,000 [h]	1.06	(0.836 – 1.334)	1.04	(0.802 – 1.336)	1.11	(0.771 – 1.612)	1.54+	(0.997 – 2.383)
Income $60,001–100,000 [h]	1.02	(0.805 – 1.302)	1.14	(0.877 – 1.474)	0.98	(0.654 – 1.458)	1.33	(0.823 – 2.157)
CATI [i]	0.88	(0.646 – 1.189)	0.98	(0.703 – 1.360)	0.73	(0.449 – 1.194)	1.03	(0.589 – 1.814)
Web panel [i,j]	1.33**	(1.121 – 1.574)	1.31**	(1.088 – 1.578)	1.99***	(1.569 – 2.530)	2.06***	(1.541 – 2.753)
Fair or poor self-rated health	1.03	(0.803 – 1.324)	0.98	(0.738 – 1.307)	0.91	(0.639 – 1.294)	0.95	(0.570 – 1.570)
Fair or poor quality of life	1.15	(0.894 – 1.492)	1.20	(0.904 – 1.590)	1.00	(0.698 – 1.431)	1.31	(0.805 – 2.117)

	Any Drug Use [k]		Marijuana Use		Prescription Drug Misuse		Other Drug Use	
			OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Depression/anxiety in past 2 weeks	1.67***	(1.393 – 1.995)	1.72***	(1.413 – 2.083)	1.87***	(1.438 – 2.440)	2.40***	(1.791 – 3.202)
Chronic pain	1.86***	(1.577 – 2.187)	1.57***	(1.306 – 1.883)	2.28***	(1.802 – 2.882)	1.61**	(1.199 – 2.171)

[a]Models adjust for age, gender, race/ethnicity, education, marital status, employment, income, sample.

[b]Models adjust for age, gender, race/ethnicity, education, marital status, employment, income, sample, self-rated health, quality of life, and depression/anxiety in past year.

[c]Models adjust for age, gender, race/ethnicity, education, marital status, employment, income, sample, self-rated health, quality of life, depression/anxiety in past year, and chronic pain.

[d]Compared to females,

[e]Compared to Non-Hispanic White,

[f]Compared to College degree,

[g]Compared to Married,

[h]Compared to income >$100,001,

[i]Compared to ABS Sample

[j]Panel sample completed same web survey as ABS.

[k]Based on any marijuana use, prescription drug misuse, or other drug use

Logistic regression (Odds ratio [OR] and 95% confidence interval [CI]) models.

***p<0.001,

**p<0.01,

*p<0.05

Note. Data come from the 2020 National Alcohol Survey. CATI = computer-assisted telephone interview. ABS = address-based sample (referent).

Table 5:

Unadjusted and Adjusted Models for Chronic Pain, by Disability Status

	Chronic Pain	
	OR	**(95% CI)**
Model 1: Unadjusted		
Disability	5.00***	(4.288 – 5.826)
Model 2: Adjusted for demographics [a]		
Disability	4.39***	(3.693 – 5.227)
Model 3: Adjusted for demographics and clinical characteristics [b]		
Disability	3.42***	(2.843 – 4.107)
Age (continuous)	1.01***	(1.009 – 1.019)
Male[c]	0.85*	(0.733 – 0.975)
Black/African American[d]	0.73***	(0.610 – 0.878)
Latino[d]	0.79*	(0.652 – 0.958)
Asian[d]	0.93	(0.761 – 1.137)
High school or less[e]	1.19+	(0.979 – 1.444)
Some college[e]	1.45***	(1.235 – 1.706)
Separated/Divorced/ Widowed[f]	1.12	(0.929 – 1.359)
Never married[f]	0.85	(0.703 – 1.033)
Employed	1.01	(0.863 – 1.191)
Income < $20,000[g]	1.02	(0.782 – 1.323)
Income $20,001–40,000[g]	0.97	(0.764 – 1.239)
Income $40,001–60,000[g]	0.90	(0.720 – 1.117)
Income $60,001–100,000[g]	1.16	(0.928 – 1.440)
CATI[h]	1.02	(0.767 – 1.362)
Web panel[h,i]	0.69***	(0.581 – 0.815)
Fair or poor self-rated health	2.83***	(2.247 – 3.559)
Fair or poor quality of life	1.78***	(1.377 – 2.305)
Depression/anxiety in past 2 wks	1.77***	(1.471 – 2.125)

[a] Models adjust for age, gender, race/ethnicity, education, marital status, employment, income, sample.

[b] Models adjust for age, gender, race/ethnicity, education, marital status, employment, income, sample, self-rated health, quality of life, and depression/anxiety in past year.

[c] Compared to females,

[d] Compared to Non-Hispanic White,

[e] Compared to College degree,

[f] Compared to Married,

[g] Compared to income >$100,001,

[h] Compared to ABS Sample

[i] Panel sample completed same web survey as ABS.

Logistic regression (Odds ratio [OR] and 95% confidence interval [CI]) models.

*** p<0.001

** p<0.01

* p<0.05

Note. Data come from the 2020 National Alcohol Survey. CATI = computer-assisted telephone interview. ABS = address-based sample (referent).

Table 6:

Percentage of Total Effect of Disability Accounted for by Chronic Pain, across Substance Use Types

Substance Use Variable	Percentage of total effect accounted for by chronic pain (95% CI)
Daily nicotine use	27.7% (17.5 – 56.9%)
Past year any drug use [a]	37.8% (24.8 – 71.5%)
Past year prescription drug misuse	26.5% (18.8 – 40.4%)
Past year other drug use	16.8% (10.8 – 30.8%)

[a]Based on any marijuana use, prescription drug misuse, or other drug use in the past year.