

Substance Use Treatment Utilization Among Individuals With Substance Use Disorders in the United States During the COVID-19 Pandemic: Findings on the Role of Polysubstance Use, Criminal Justice Involvement, and Mental Illness From the National Survey on Drug Use and Health

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ABSTRACT: This study used the National Survey on Drug Use and Health to assess a nationally representative sample (N = 4596) weighted to represent 35.2 million adults with DSM-5 criteria-determined substance use disorders (SUDs). This study explored substance use treatment utilization in 2020, emphasizing populations with high vulnerability (e.g., criminal justice involvement (CJI) through parole or probation, polysubstance use, severe mental illness, and HIV/STI). Substance use treatment was broadly defined (any inpatient, outpatient/doctor's office, self-help/other for alcohol/drugs). Our results indicated that among adults with SUDs in 2020, 7 million (20%) had multiple SUDs, 1.75 million (5%) had CJI, 5.3 million (15%) had a severe mental illness, and 1.8 million (5%) had a diagnosis of HIV/STI in the last year. Only 7% of individuals with SUD sought any substance use treatment in the past year. CJI (aOR: 13.39, 95% CI: [7.82, 22.94]), serious mental illness (aOR: 3.27, 95% CI: [1.93, 5.55]), and having both 2 (aOR: 2.10, 95% CI: [1.29, 3.42]) or 3 or more SUDs (aOR: 3.46, 95% CI: [1.82, 6.58]) were all associated with a greater likelihood of receiving treatment. Marriage (aOR: 0.43, 95% CI: [0.25, 0.74]) and having an income twice the poverty threshold (aOR: 0.53, 95% CI: [0.29, 0.94]) were associated with reduced odds of receiving any substance use treatment. Compared to those 18 to 25, older individuals had increased odds (2–4 times) of receiving treatment. Interventions are crucially needed to increase access to treatment among those with SUDs.

KEYWORDS: Substance use treatment, COVID-19 pandemic, polysubstance use, criminal justice involvement, mental illness

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Introduction

Increasing substance use and drug overdose deaths during the COVID-19 pandemic

The COVID-19 pandemic era was marked by increases in the initiation of substance use and increases in the amount of substances used to cope with stress or other negative emotions.^{1,2} During the pandemic, people who use substances were also more likely to use substances in isolation or to use dangerous drug combinations, including fentanyl, increasing the risk of experiencing an overdose.³ Consequently, rates of drug overdose deaths rose dramatically during this time, particularly in the late spring of 2020.^{4,5} Access to substance use treatment is vital to reducing substance use, drug overdoses, and associated adverse social and health consequences related to substance use. It is important to understand treatment access during this tumultuous time, and to elucidate substance use treatment utilization rates by subpopulations most vulnerable to adverse consequences.

Substance use treatment during the COVID-19 pandemic

Nationally, the most common types of treatment in the United States are non-professional self-help groups (such as 12-step meetings), outpatient treatment (such as in a private doctor's office or mental health clinic), and inpatient residential programs.⁶ Evidence suggests that these treatment modalities effectively promote reduced use or continuous abstinence from alcohol⁷ and other substances.^{8,9} Yet, for many individuals with SUD, access to treatment programs was limited during the pandemic^{10,11}; during this time, there were many social and economic barriers to receiving needed substance use treatment and harm reduction services due to social distancing protocols and other pandemic-related concerns.^{10–13} While the rise of telehealth appointments may have increased access to treatment for some individuals, telehealth appointments may not have been accessible to those who did not have a reliable cell phone or internet access.¹²



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Substance use treatment among vulnerable populations

Many individuals experience co-occurring vulnerabilities that may complicate access to treatment, such as involvement with the criminal justice system, having a serious mental illness, being diagnosed with sexually transmitted diseases (STIs), or human immunodeficiency virus (HIV), or engaging in polysubstance use. With regard to criminal justice involvement (CJI), it has been estimated that 24% of incarcerated people meet the diagnostic criteria for alcohol use disorder when first arriving at prison, while 51% meet the criteria for drug use disorders.¹⁴ These rates are much higher than those reported in the general population; in 2022, 17.3% of the general population was estimated to have alcohol use disorder, while only 9.7% had a drug use disorder.¹⁵ With regard to HIV, it has been estimated that of adults who are HIV-positive, 48% have an SUD.¹⁶ In 2021, 6.4 million American adults had both a substance use disorder, and a serious mental illness.¹⁷ Additionally, these vulnerabilities may often interact with one another; for example, individuals with both a substance use disorder and severe mental illness are much more likely to become involved in the criminal justice system than those with neither circumstance, or only one.¹⁸

Prior research on the impact of these vulnerabilities on treatment utilization has been mixed. Some studies suggest that individuals with these comorbidities are *more likely* to receive SUD treatment, while others studies suggest the opposite. For instance, extant research shows that those involved in the criminal justice system and who use opioids are less likely to be referred to medications for opioid use disorder (MOUD) programs.¹⁹ However, those with comorbid mental health disorders are more likely to receive SUD treatment both in the general population,²⁰ and for those with CJI.²¹ With regard to HIV status, veterans with SUD and HIV were 5% more likely to initiate SUD treatment and 10% more likely be retained in treatment at six months, when compared to their counterparts who were not HIV-positive, though these effect sizes are quite small and may have been inflated by the large sample size of the study.²² Polysubstance use may also influence treatment reception, though prior research has also been mixed. Pre-pandemic evidence suggests that individuals who used opioids in co-use with other substances,²³ or who were diagnosed with opioid use disorder (OUD) in tandem with another SUD,²⁴ were less likely to receive MOUD treatment than those who only used opioids, or were only diagnosed with OUD. On the contrary, veterans with polysubstance use disorders were more likely to receive psychiatric treatment than those with single substance use disorders,²⁵ and those who co-used opioids along with other substances were more likely to receive intensive treatment services than those who only used opioids.²⁴ Taken together, this evidence suggests that these 4 co-vulnerabilities (mental illness, CJI, HIV/STI diagnosis, and polysubstance use) may impact substance use treatment reception, both for better and for worse.

Current study

Given the lack of consensus in previous findings, and the additional complication of the COVID-19 pandemic, this study used a nationally representative sample of adults with SUD to explore substance use treatment utilization in 2020. The aims of this study are 2-fold: (1) to evaluate rates of SUD treatment utilization in 2020 and (2) to assess SUD treatment utilization among individuals who also had high co-occurring vulnerability (e.g., CJI through parole or probation, polysubstance use, severe mental illness, and HIV/STI diagnosis). The analyses controlled for demographic covariates that may have also been related to the likelihood of treatment reception.

Methods

Data overview

This study utilizes data from the 2020 wave of the National Survey on Drug Use and Health (NSDUH). NSDUH is a cross-sectional, deidentified, publicly available, and nationally representative dataset, and is collected annually by the Substance Abuse and Mental Health Services Administration. The authors had no access to information which could be used to identify individual participants. NSDUH employs a sampling method stratified by states, census tracts, census blocks, area segments, and specific dwelling units. This stratified sampling method allows for calculating person-level analysis weights, which can be used to weight observed data to approximate the United States population. It is important to note that while sample weighting can approximate the means in the population, sample weighting cannot introduce variation that is not included in the observed sample. Extensive information on sample weighting for this particular cohort is detailed in a report by NSDUH.²⁶

All participants were recruited in 2020. The analytical sample includes only those participants who were 18 years or older and who met the criteria for having a SUD, according to the DSM-5. In total, this analytical sample includes 4596 people, weighted to represent 35.2 million adults. While it may have been relevant to the aims of the paper to directly compare 2020 NSDUH rates of treatment utilization with rates from prior years, the NSDUH team cautioned against comparing 2020 data with data from prior years. This is because of methodological changes made in 2020, to accommodate for the circumstances of the COVID-19 pandemic.⁶

Measures

Substance use disorders and treatment reception. SUD diagnosis was determined using the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-V) criteria. Participants were evaluated for SUD with regard to 11 possible substances: alcohol, marijuana, cocaine, heroin, hallucinogens, inhalants, methamphetamine, prescription pain relievers, tranquilizers, stimulants, and sedatives. In contrast with the DSM-V, participants were only presented the diagnostic

items if they met a certain threshold of use for each individual substance. For alcohol and marijuana, diagnostic items were presented only if participants endorsed that they had used alcohol and marijuana in the last year for more than 5 days or if they did not endorse the specific number of days that they had used alcohol or marijuana in the previous year. The diagnostic items were presented for the other substances if the participant had previously endorsed any use in the last year.

Nine to eleven items were presented regarding the participant's use of each substance, dependent on the specific substance in question. These items included "Some people who [use the specific substance] try to cut down or stop but find they can't. Was there more than one time in the past 12 months when you tried but were unable to cut down or stop [using the substance]?" and "During the past 12 months, did you have any long-lasting or repeated physical health problems that were caused or made worse by [using the substance]?" To be classified with the particular disorder, participants had to have responded affirmatively to at least 2 of the diagnostic criteria. Only participants who met the diagnostic criteria for at least 1 substance were included in the analysis.

Participants who met diagnostic criteria for at least 1 SUD were then asked if they received any SUD treatment in the last year. Participants responded affirmatively or negatively to the question, "During the past 12 months, . . . have you received treatment or counseling for your use of alcohol or any drug, not counting cigarettes?" Substance use treatment was broadly defined (any inpatient, outpatient/doctor's office, self-help/other for alcohol/drugs).

Demographic variables. Participants reported on 10 demographic variables shown to be linked with substance use treatment utilization: age, sex, education, income, race, employment, area of residence, health insurance, marital status, and having children in their household.²⁷⁻³²

Age, sex, race/ethnicity, and familial demographic variables. In the NSDUH, the only sex/gender variable assessed is biological sex, which is male and female. Males were treated as the reference group. Age was assessed using the categorization of 18 to 25, 26 to 34, 35 to 49, 50 to 64, or 60 or older, using the youngest age group as the reference group. Though NSDUH provides data on multiple races and ethnicities, race/ethnicity was truncated into 4 categories to account for small subsample sizes. These categories are Hispanic, Non-Hispanic White, Non-Hispanic Black, and Other (including Non-Hispanic Native American/Alaskan Native, Non-Hispanic Native Hawaiian/Pacific Islander, Non-Hispanic Asian, and Non-Hispanic more than 1 race). Non-Hispanic Whites were treated as the reference group.

Regarding familial circumstances, self-reported marital status and the number of dependents in the home were treated in the analysis as covariates. The NSDUH marital status response

categories were truncated to be *not currently married* (including widowed, divorced, separated, or never married) and *currently married*. Those who were not currently married were treated as the reference group. To assess dependents, participants self-reported the number of children under 18 years old living in their household. For the sake of this analysis, this variable was truncated into a binary variable of *no children in the household* or *1 or more children in the household*. Those with no children were treated as the reference group.

Markers of socioeconomic status, and other covariates. Covariate predictors included variables indicative of participants' socioeconomic statuses, namely educational attainment, income within the federal poverty threshold, and employment status. Household income was recorded categorically according to the federal poverty guidelines as determined by the U.S. Census Bureau. These categories are: *living in poverty* (having a family income below the federal poverty threshold), *having an income up to 2 times the poverty threshold*, and *having an income more than 2 times the federal poverty threshold*. Those living in poverty were treated as the reference group.

Regarding educational attainment, participants self-reported their highest completed level of education (less than a high school diploma, some college, or college graduate or higher); *less than a high school diploma* was treated as the reference group. Lastly, self-reported employment status was categorical, namely, *full-time employed*, *part-time employed*, *unemployed* (including those who had a job/volunteer work but did not work in the last week, those who were unemployed but looking for work, and those who did not have a job for some other reason) and *other* (including those who were disabled, keeping house full-time, in school or a training program, or retired). Those working full-time were treated as the reference group.

In addition, predictors included variables that may indicate the availability of SUD treatment in participants' areas of residence, namely the rurality of the county where each participant lived. The 2013 Rural-Urban Continuum Codes by the USDA were used to identify if participants lived in a *small metropolitan area*, a *large metropolitan area*, or a *nonmetropolitan* (or rural) area.³³ Those living in a rural area were treated as the reference group. Furthermore, participants reported whether they currently had health insurance or were uninsured, a factor in seeking health care. Those without health insurance were treated as the reference group.

Vulnerable circumstances. Four indices of comorbid vulnerability were treated as predictors of treatment reception, namely CJI, polysubstance use, mental illness severity, and HIV/STI status. CJI was operationalized as being on probation or parole at any time in the last 12 months. Polysubstance use was operationalized as meeting the DSM-5 criteria for multiple SUDs. Count variables were calculated for each of the 11 possible SUDs which participants may have endorsed.

This variable was truncated as 1 SUD, 2 SUDs, and 3 or more SUDS because only 4% of the sample met the criteria for the latter category. Those with only 1 SUD were treated as the reference group.

Past-year mental illness severity was categorized according to predictive models developed in 2012 by the NSDUH team (see Appendix E of the 2020 National Survey on Drug Use and Health Public Use File Codebook for detailed information).²⁶ These categories are *no mental illness*, *mild mental illness*, *moderate mental illness*, and *severe mental illness*. Those with no mental illness were treated as the reference group.

Finally, participants self-reported whether they had been diagnosed with HIV/AIDS or had been diagnosed with an STI in the past year. Those without a diagnosis in the last year were treated as the reference group.

Analytical strategy

To address the first aim of the study, descriptive statistics were calculated using the weighted data, to assess the rates of treatment reception among the Americans with SUD during 2020. In addition, Rao-Scott Chi-squares were calculated to assess whether proportions of the demographic and vulnerable experiences differed between those who received treatment, and those who did not.

To address the second aim, a binary logistic regression assessed the relationship between sociodemographic covariates, vulnerable circumstances, and SUD treatment reception. The binary variable of treatment reception was treated as the outcome, while the sociodemographic and circumstantial variables were treated as predictors. All analyses were performed using the statistical software SAS.

Results

Sample characteristics

Both observed, and sample-weighted descriptive statistics of all study variables are detailed in Table 1. Of the 35.1 million American adults with SUDs in 2020, only an estimated 2.6 million (7%) participated in any treatment program (see Figure 1A). The most frequent treatment setting was outpatient with a medical provider (4.2%), followed by self-help groups such as Alcoholics Anonymous and Narcotics Anonymous (3.7%), care received at a hospital, such as at the emergency room or overnight as an inpatient (1.7%), and at a dedicated inpatient residential substance use treatment facility (0.8%). The most frequent SUD was alcohol use disorder (72.8%), followed by marijuana use disorder (37.1%) and prescription pain reliever use disorder (4.4%) (see Figure 1B).

Concerning the demographic variables, an estimated 45% of the weighted sample was female. Only 36% of the sample was married, and only 32% had children living in their homes. Most of the sample (85%) had health insurance in the last year,

and 64% were Non-Hispanic White. Age was well-distributed: 22% of the sample was 18 to 25 years old, 22% was 26 to 34, 29% was 35 to 49, 18% was 50 to 64, and 10% was 65 or older. Educational attainment was also well-distributed across the sample. About 10% of the sample was estimated to have not attained a high school diploma, 24% had a high school diploma or completed a GED, 36% attended some college, and 30% completed a college degree or more. Income was measured according to the federal poverty guidelines; around an estimated one-fifth of the sample reported living in poverty (18%) or having income up to 2 times the federal poverty threshold (19%). In comparison, 63% had an income twice the federal poverty threshold or higher. In terms of employment, most participants were estimated to be employed full-time (49%) or employed part-time (12%). Over half of the sample lived in a rural, nonmetropolitan area (55%), while 32% lived in a small metropolitan area, and 13% lived in a large metropolitan area.

With regard to vulnerable circumstances, 1.75 million (5%) adults with SUD were estimated to be involved with the criminal justice system. An estimated 7 million adults (20%) had multiple SUDs. Specifically, 16% of the sample met the diagnostic criteria for 2 SUDs, and 4% met the criteria for 3 or more SUDs. 46% of the sample had a mental illness in the last year. Specifically, 6.8 million adults (19%) had a mild mental illness, 3.9 million adults (11%) had a moderate mental illness, and 5.3 million (15%) had a serious mental illness. See Table 1 for the raw and weighted counts of all study variables.

Rao-Scott Chi-Squares were calculated to assess whether proportions among the categorical predictors differed between those who received treatment and those who did not (see Table 1). Concerning the demographic variables, there were significant proportional differences for income ($\chi^2(2) = 26.0, P < .001$), employment ($\chi^2(3) = 12.9, P = .005$), rurality ($\chi^2(2) = 6.9, P = .03$), and marital status ($\chi^2(1) = 16.2, P < .001$). Regarding vulnerable circumstances, proportions differed by treatment reception for mental illness severity ($\chi^2(3) = 27.4, P < .001$) as well as polysubstance use ($\chi^2(2) = 49.9, P < .001$).

Binary logistic regression

The results of the binary logistic regression are detailed in Table 2. The results indicated that treatment utilization was more prevalent among older age groups than young adults aged 18 to 25. Specifically, those aged 26 to 34 were about 2.4 times more likely to receive treatment than young adults (aOR: 2.39, 95% CI [1.26, 4.54]), those aged 35 to 49 were about 2.6 times more likely to receive treatment than young adults (aOR: 2.62, 95% CI [1.42, 4.82]), and those aged 50 to 64 were almost 5 times more likely to receive treatment than young adults (aOR: 4.50, 95% CI [2.03, 9.98]).

Income predicted substance use treatment, such that those with income up to 2 times the poverty threshold were less

Table 1. Counts of study variables and chi-squares comparing those who did and did not receive treatment.

	OBSERVED FREQUENCIES		SAMPLE-WEIGHTED FREQUENCIES							
	(N=4596)		(N=35.2 MILLION)							
	OVERALL		OVERALL			NO TREATMENT RECEPTION		TREATMENT RECEPTION		χ^2 ; F(DF)
	N	%	N	%	SE OF %	N	%	N	%	
Any treatment reception	286	6.2	2556498	7.3	0.75	-	-	-	-	-
Age										
18-25	1785	38.8	7588767	21.6	0.88	7279314	95.9	309453	4.1	9.3; 2.3(4)
26-34	1136	24.7	7752309	22.1	1.00	7126606	91.9	625703	8.1	
35-49	1208	26.3	10049121	28.6	1.16	9260622	92.2	788499	7.9	
50-64	315	6.9	6230332	17.7	1.46	5570609	89.4	659723	10.6	
65+	152	3.3	3524461	10.0	1.13	3351341	95.1	173120	4.9	
Sex (Female)	2332	50.7	15705015	44.7	1.39	14507242	92.4	1197773	7.6	0.2; 0.2(1)
Education										
Less than high school diploma	326	7.1	3346300	9.5	1.02	3025559	90.4	320740	9.6	7.6; 2.5(3)
High school/GED graduate	935	20.3	8465875	24.1	1.30	7713983	91.1	751892	8.9	
Some college	1619	35.2	12738953	36.2	1.31	11689512	91.8	1049441	8.2	
College graduate or higher	1716	37.3	10593861	30.1	1.19	10159437	95.9	434425	4.1	
Income										
Living in poverty	786	17.1	6210167	17.7	1.13	5287624	85.1	922542	14.9	26.0; 13.0(2)***
Up to 2x federal poverty threshold	826	18.0	6593951	18.8	1.04	6230149	94.5	363803	5.5	
2x federal poverty threshold or higher	2953	64.3	22258915	63.3	1.35	20990173	94.3	1268742	5.7	
Race										
Non-Hispanic White	3216	70.0	23326377	66.4	1.38	21702592	93.0	1623785	7.0	3.8; 1.3(3)
Non-Hispanic African-American/Black	371	8.1	4189354	11.9	1.00	3967827	94.7	221527	5.3	
Hispanic	537	11.7	4733546	13.5	1.05	4361153	92.1	372393	7.9	
Non-Hispanic other	472	10.3	2895712	8.2	0.76	2556920	88.3	338792	11.7	
Employment										
Unemployed	937	20.4	6860971	19.5	1.13	6091115	88.8	769857	11.2	12.9; 4.3(3)**
Part-time	646	14.1	4299746	12.2	0.89	4044840	94.1	254907	5.9	
Full-time	2357	51.3	17339951	49.3	1.40	16486907	95.1	853044	4.9	
Other	656	14.3	6644320	18.9	1.21	5965630	89.8	678691	10.2	

(Continued)

Table 1. (Continued)

	OBSERVED FREQUENCIES		SAMPLE-WEIGHTED FREQUENCIES							
	(N=4596)		(N=35.2 MILLION)							
	OVERALL		OVERALL			NO TREATMENT RECEPTION		TREATMENT RECEPTION		χ^2 ; F(DF)
N	%	N	%	SE OF %	N	%	N	%		
Rurality										
Non-metro	796	17.3	19394221	55.2	1.37	18225007	94.0	1169215	6.0	6.9; 3.4(2)*
Small metro	1749	38.1	11271951	32.1	1.26	10161050	90.1	1110901	9.9	
Large metro	2051	44.6	4478817	12.7	0.91	4202435	93.8	276382	6.2	
Health insurance	3963	86.2	29981573	85.3	0.93	27820375	92.8	2161198	7.2	0.06; 0.06(1)
Currently married	1334	29.0	12543030	35.7	1.39	12044879	96.0	498152	4.0	16.2; 16.2(1)***
Any children in household	1472	32.0	11094139	31.6	1.23	10418331	93.9	675808	6.1	1.5; 1.5(1)
Criminal justice involvement	169	3.7	1605650	4.6	0.63	802927	50.0	802723	50.0	0.1; 0.1(1)
Past-year mental illness										
None	2297	50.0	19128019	54.4	1.39	18359548	96.0	768471	4.0	27.4; 9.2(3)***
Mild	887	19.3	6777500	19.3	1.21	6158590	90.9	618910	9.1	
Moderate	588	12.8	3944778	11.2	0.77	3550285	90.0	394493	10.0	
Serious	824	17.9	5294692	15.1	0.91	4520069	85.4	774624	14.6	
Last year diagnosis of STI/HIV	246	5.4	1816017	5.2	0.54	1636567	90.1	179450	9.9	0.84; 0.84(1)
Number of SUDs										
1 SUD	3603	78.4	28143227	80.1	1.04	26,701,784	94.9	1441443	5.1	49.9; 25.0(2)***
2 SUDs	811	17.6	5753463	16.4	0.98	4991038	86.8	762425	13.3	
3 or more SUDs	182	4.0	1248299	3.6	0.41	895669	71.8	352630	28.3	

Abbreviations: F , F statistic; df , degrees of freedom; χ^2 , Rao-Scott Chi-Square of sample-weighted frequencies comparing proportions between those who did and did not receive treatment.

* $P < .05$. ** $P < .01$. *** $P < .001$.

likely to receive treatment than those living in poverty (aOR: 0.53, 95% CI [0.29, 0.94]); Currently married respondents were about half as likely to receive treatment than married respondents (aOR: 0.43, 95% CI [0.25, 0.74]).

In addition, those who were on probation or parole, had a serious mental illness, or had multiple SUDs were all significantly more likely to receive treatment than those who did not experience these vulnerabilities. Those with CJI were roughly 13 times more likely to receive treatment than those without CJI (aOR: 13.39, 95% CI [7.82, 22.94]). Those with a serious mental illness were roughly 3.3 times more likely to receive treatment than those without mental illness (aOR: 3.27, 95% CI [1.93, 5.55]). Finally, those with 2 SUDs were roughly 2 times more likely to receive treatment than those with only 1 SUD (aOR: 2.10, 95% CI [1.29, 3.42]) and those with 3 or

more SUDs were roughly 3.5 times more likely to receive treatment than those with only 1 SUD (aOR: 3.46, 95% CI [1.82, 6.58]). Sex, education, race, employment, rurality, health insurance, having children in one's household, and STI/HIV diagnosis did not significantly predict treatment reception.

Discussion

This study assessed substance use treatment utilization in 2020, emphasizing populations with high vulnerability. The study found that of the estimated 35.2 million adults with SUDs in 2020, only 7% (SE=0.75) received any form of treatment for their substance use. This rate of treatment reception is seemingly a reduction compared to the year immediately before the pandemic (though it should be cautioned that pandemic-related factors preclude direct comparison with NSDUH data

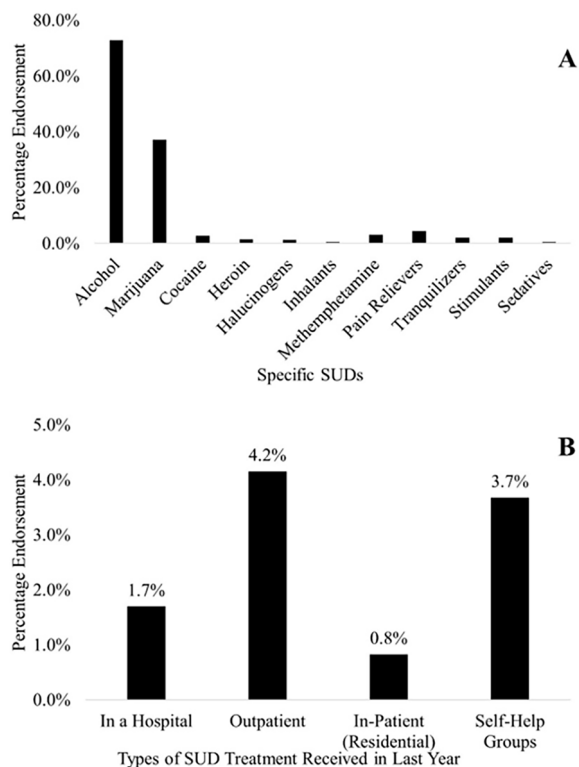


Figure 1. (A) Frequencies of specific SUDs in 2020; (B) Frequencies of treatment settings among those with SUDs in 2020. For both figures A and B, categories were not exclusive from 1 another.

Table 2. Binary logistic regression predicting treatment reception.

	ADJUSTED ODDS RATIO ^a	95% CI
Intercept	0.01***	[0.00, 0.04]
Age (Reference: 18-25 y old)		
26-34 y old	2.39**	[1.26, 4.54]
35-49 y old	2.62**	[1.42, 4.82]
50-64 y old	4.50***	[2.03, 9.98]
65+	2.66	[0.88, 8.03]
Sex (Reference: Male)	0.97	[0.61, 1.55]
Education (Reference: Less than H.S. diploma)		
High school/GED graduate	1.36	[0.67, 2.78]
Some college	1.23	[0.60, 2.48]
College graduate or higher	0.86	[0.35, 2.15]
Income (Reference: Living in Poverty)		
Up to 2× federal poverty threshold	0.53*	[0.29, 0.94]
2× federal poverty threshold or higher	0.81	[0.45, 1.44]

(Continued)

Table 2. (Continued)

	ADJUSTED ODDS RATIO ^a	95% CI
Race (Reference: Non-Hispanic White)		
Hispanic	1.18	[0.60, 2.33]
Non-Hispanic African-American/Black	0.87	[0.36, 2.07]
Non-Hispanic Other	1.44	[0.73, 2.84]
Employment (Reference: Full-time)		
Unemployed	1.06	[0.61, 1.84]
Part-time	0.92	[0.43, 1.97]
Other	1.26	[0.65, 2.45]
Rurality (Reference: Nonmetro)		
Small metro	1.36	[0.64, 2.87]
Large metro	1.55	[0.78, 3.06]
Currently has any health insurance	1.35	[0.71, 2.57]
Currently married	0.43**	[0.25, 0.74]
Any children in household	0.91	[0.58, 1.43]
Criminal Justice Involvement	13.39***	[7.82, 22.94]
Past-year mental illness (Reference: None)		
Mild	1.53	[0.85, 2.78]
Moderate	1.92	[1.00, 3.72]
Serious	3.27***	[1.93, 5.55]
Last year diagnosis of STI/HIV	1.30	[0.59, 2.85]
Number of SUDs (Reference: 1)		
2	2.10**	[1.29, 3.42]
3 or more	3.46***	[1.82, 6.58]

^aAdjusted odds ratios control for all other predictors in the model. **P* < .05. ***P* < .01. ****P* < .001.

collected during non-pandemic years); in 2019, 10.2% of American adults with SUDs received any treatment.³⁴

Though very few individuals with SUDs received treatment during the pandemic, those with additional vulnerabilities were generally more likely to receive substance use treatment in 2020, than those who did not have additional vulnerabilities. For instance, those on probation or parole were 13 times (aOR = 13.39) more likely to receive treatment than those not involved with the criminal justice system. Those with serious mental illness were about 3 times more likely (aOR = 3.27) to receive treatment for substance use than those without mental illness. Those with 2 SUDs, or 3 or more SUDs, were 2 times more likely, and 3.5 times more likely (aOR = 2.10; aOR = 3.46)

to receive treatment than those with only 1 SUD, respectively. The authors postulate that there are 2 possible explanations for this pattern across the vulnerabilities.

First, it is possible that in a time when many support services were limited or nonoperational, those with additional vulnerabilities were more likely to have contact with referral sources to SUD treatment, or to actively seek out treatment, than those without additional vulnerabilities. In general, referrals to treatment for SUDs can come from various sources, including primary care medical providers,^{35,36} mental health professionals,³⁷ and the criminal justice system.²⁹ During the pandemic's peak, access to these possible referral sources became very limited as many non-emergent primary care appointments and other routine medical screenings were canceled or postponed.^{38,39} However, because people with serious mental health concerns are more likely to have contact with structured supports such as emergency medical personnel⁴⁰ and inpatient psychiatric treatment⁴¹ than those without serious mental illness, this contact may have served as a possible referral source to SUD treatment. Additionally, because those with serious mental illness very often experience distress and impeded functioning in their daily lives,⁴² this population may be more likely to purposefully seek treatment for SUDs—even during a pandemic—than those who are not experiencing mental illness.

The same logic may also apply to those with multiple SUDs. Overall, those who engage in polysubstance use or have multiple SUDs are more likely to have a lower degree of functioning across multiple domains^{43,44} and a higher likelihood of various adverse physical health outcomes,⁴⁵ including overdose.⁴⁶ Because of these adverse and difficult experiences, individuals with multiple SUDs may have had more reason to initiate or continue contact with healthcare professionals, even when care services were limited or difficult to access. Hence, those with multiple SUDs may have been more likely to have been referred to, and receive, treatment than those who only met the diagnostic criteria for 1 SUD.

Second, the criminal justice system likely served as a relatively stable referral source to treatment. People with SUD on probation often *must* participate in treatment as a condition of their release from incarceration.⁴⁷ Failing to participate in treatment may lead to serious consequences, such as reincarceration.⁴⁷ Thus, it is not surprising that being involved with the criminal justice system predicted receiving SUD treatment.

There are multiple limitations to this study. First, NSDUH relies on participants' self-report of substance use which may result in under-identifying those who meet the diagnostic criteria for an SUD. Additionally, this data did not specify which participants sought treatment, but were unable to access it. While NSDUH does inquire about reasons for nonengagement in treatment, these items are only presented to those who self-identify as needing treatment, regardless of their

SUD status. It is possible that vulnerable participants with SUD were simply more likely to self-initiate treatment during the pandemic, when compared with those without these vulnerabilities.

Second, in 2020, NSDUH methodological changes to accommodate the COVID-19 pandemic rendered data incomparable with NSUDH data from prior years. These changes included an adjustment to the way SUDs were defined, collecting data only in the first and fourth quarters of the year (rather than throughout the year), collecting data virtually, and a lower survey response rate. Third, sample weighting is not likely to capture events that are rare within the population, especially in small subpopulations. For instance, in this study, older adults are represented by fewer than 200 participants. Given such a small subsample size, it is likely that rarer events—such as HIV and serious mental illness—are underrepresented for this subpopulation in the weighted sample. Fourth, cross-sectional data does not allow for causal inferences or to assess changes in treatment reception over time.

Finally, it should also be noted that treatment was broadly defined in this study to include outpatient care with a medical provider, self-help groups, any care received at a hospital, or an inpatient residential treatment facility (see Figure 1B). Because treatment was broadly defined, there is likely a high degree of variation in treatment quality and retention in treatment programs. For example, some participants may have attended very few self-help group meetings, while others may have attended meetings very consistently. Additionally, some participants may have received care at a hospital only briefly for an acute emergency event but did not pursue further treatment after their release from the hospital. Even with these limitations, this study boasts a large, nationally representative sample of people with SUDs and provides insight into substance use treatment utilization in 2020. Future studies should consider both the quality and retention of treatment services during the pandemic, especially for those with additional vulnerabilities.

Conclusion

As overdose deaths skyrocketed during the COVID-19 pandemic, unprecedented social and economic issues increased barriers to treatment for SUDs. This study adds to the body of research regarding the experience of those with SUDs during the pandemic. In particular, this study clarifies discrepancies in previous findings regarding the role comorbid vulnerabilities may play in treatment initiation for SUD. Using a nationally representative sample, this study explored substance use treatment reception rates during the pandemic among those with SUDs, especially emphasizing populations with high vulnerability. Populations with high vulnerability were more likely to receive substance use treatment, perhaps because they were more likely to have contact with referral sources, or because the criminal justice system may have mandated SUD treatment.

Future research should assess rates of SUD treatment reception, and the effect of co-vulnerabilities on treatment reception, post-pandemic, as well as explore how specific barriers to treatment initiation differ between those with and without significant comorbidities. This information could then be used to inform case management interventions, designed to help clients with their specific individual needs, including possible referrals to substance use treatment.

While populations with high vulnerability were more likely to receive substance use treatment, 93% of U.S. adults with SUDs received no treatment in 2020. Interventions to improve screening and referrals for substance use treatment are crucially needed. Additionally, more public funding and resources are needed to ensure that treatment is available to all those who need it, not just those with the most acute vulnerabilities. This is especially needed in times of crisis, such as the pandemic.

Author Contributions

HBA wrote the original draft and edited subsequent drafts. ARS conducted the formal analysis. JG reviewed and edited the manuscript. GH reviewed and edited the manuscript. AAJ conceptualized and supervised the study, designed the data analysis plan, and reviewed and edited the manuscript.

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