Substance Use by Adults with Medical Multimorbidity in the United States, 2015–2016

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INTRODUCTION

Adults with medical multimorbidity, usually defined as ≥ 2 concurrent chronic conditions, have high rates of healthcare utilization and often receive poorly coordinated care.[1] Living with medical multimorbidity usually includes taking multiple medications and careful monitoring of individual diseases. The intersection of substance use and chronic disease is complex,[2] as substance use can have negative effects on chronic diseases and its management.

However, few studies have focused on the intersection of chronic medical disease and substance use, especially among adults with multimorbidity. Therefore, the objective for this study was to use cross-sectional data from a nationally representative sample of adults in the United States (US) to estimate the prevalence of substance use among adults with chronic medical diseases, and to determine correlates of substance use among adults with medical multimorbidity.

METHODS

Data were utilized from the 2015–2016 National Survey on Drug Use and Health (NSDUH), an annual cross-sectional survey of non-institutionalized individuals in the US. Participants were assessed for past-year use of cannabis, cocaine, methamphetamine, heroin, inhalants, hallucinogens, and prescription drug misuse (opioids, tranquilizers, stimulants, and sedatives), and substance use disorder (SUD) related to use of these substances based on *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV)[3] criteria. Ten self-reported chronic medical conditions (ever diagnosed by a doctor in one's lifetime) were examined (asthma, bronchitis/COPD, cirrhosis, diabetes, heart conditions, hepatitis, high blood pressure, cancer, kidney disease, and HIV/AIDS). Prevalence of past-year substance use and SUD was estimated among adults (≥ 18 years of age) with 0, 1, and ≥ 2 chronic

conditions. We utilized a Holm statistical correction[4] for past-year substance use to adjust for multiple comparisons. Bivariable and multivariable logistic regression models were used to examine correlates of past-year substance use among adults with ≥ 2 chronic conditions including demographics, nicotine dependence,[5] past-year all-cause emergency department use, and alcohol use disorder (AUD).[3]

RESULTS

The analytic sample included 85,701 participants. Table 1 presents past-year substance use and SUD comparing individuals with 0, 1, and ≥ 2 chronic conditions. The most common substance used in the past year was cannabis, and cannabis use disorder was the most common SUD. Among adults with chronic conditions, past-year substance use was reported by 15.70% with 1 chronic condition and 12.80% with ≥ 2 conditions, and substance use was higher among adults with no chronic conditions (20.60%) ($p < 0.001$ for all comparisons). Criteria for any past-year SUD was met by 2.96% of adults with no chronic conditions, 2.61% with 1 chronic condition, and 2.29% with ≥ 2 conditions ($p = 0.01$). Methamphetamine use disorder was significantly higher among those with ≥ 2 chronic conditions.

Table 2 presents results from the logistic regression models for past-year drug use among adults with multimorbidity. Results from the adjusted model suggest that among adults with multimorbidity, odds of past-year drug use were lower among older participants (AOR 0.15 for adults ≥ 65 [vs. those age 18–34], $p < 0.001$), females [vs. males] (AOR 0.78, $p = 0.01$), and individuals with incomes $\geq \$75,000$/year [vs. $< \$20,000$] (AOR 0.75, $p = 0.04$). Participants reporting nicotine dependence (AOR 2.51, $p < 0.001$) or AUD (AOR 2.87, $p < 0.001$) had higher odds of reporting past-year substance use.

DISCUSSION

While prevalence of past-year drug use was lower among adults with multimorbidity, nearly 13% of adults with multimorbidity reported past-year substance use. Given that substance use can negatively impact existing chronic medical disease and complicate its management, this has important

Table 1 Past-Year Substance Use and Past-Year Substance Use Disorder by Number of Chronic Conditions, % (*n*)—United States 2015–2016

Number of chronic conditions*

	Total (*n* = 85,701)		0 chronic condition (*n* = 58,299)		1 chronic condition (*n* = 19,487)		> 2 chronic conditions (*n* = 7915)		*p* value[‡]
Substance use	*n*	% (95% CI)	*n*	% (95% CI)	*n*	% (95% CI)	*n*	% (95% CI)	
Any drug	20,750	18.10 (17.70, 18.60)	15,010	20.60 (20.00, 21.10)	4366	15.70 (15.10, 16.40)	1374	12.80 (11.70, 14.00)	< 0.001
Any drug, excluding cannabis	10,447	9.13 (8.84, 9.42)	7449	10.20 (9.84, 10.60)	2256	8.02 (7.57, 8.49)	742	6.95 (6.30, 7.65)	< 0.001
Cannabis	16,764	13.90 (13.50, 14.30)	12,389	16.40 (15.90, 16.90)	3382	11.50 (10.90, 12.10)	993	8.47 (7.58, 9.45)	< 0.001
Cocaine	2386	1.97 (1.84, 2.12)	1790	2.42 (2.27, 2.58)	494	1.67 (1.43, 1.96)	102	0.75 (0.58, 0.97)	< 0.001
Methamphetamine	686	0.61 (0.55, 0.67)	406	0.54 (0.47, 0.61)	180	0.63 (0.50, 0.80)	100	0.84 (0.65, 1.10)	0.02
Inhalants	595	0.45 (0.40, 0.52)	423	0.51 (0.44, 0.58)	137	0.42 (0.33. 0.55)	35	0.30 (0.17, 0.51	0.09
Heroin	446	0.36 (0.31, 0.40)	309	0.39 (0.35, 0.44)	91	0.28 (0.20, 0.40)	46	0.35 (0.22, 0.54)	0.22
Prescription opioid misuse	4945	4.55 (4.36, 4.74)	3392	4.83 (4.59, 5.09)	1119	4.23 (3.90, 4.60)	434	4.00 (3.53, 4.54)	0.004
Hallucinogens	2598	1.79 (1.66, 1.93)	2019	2.28 (2.13, 2.44)	504	1.42 (1.21, 1.65)	75	0.53 (0.35, 0.82)	< 0.001
Prescription tranquilizer misuse	2696	2.34 (2.21, 2.48)	1831	2.49 (2.33, 2.65)	632	2.11 (1.88, 2.36)	233	2.18 (1.81, 2.63)	0.05
Prescription sedative misuse	559	0.60 (0.54, 0.67)	338	0.54 (0.48, 0.62)	145	0.58 (0.46, 0.73)	76	0.88 (0.66, 1.16)	0.01
Prescription stimulant misuse	7489	6.70 (6.45, 6.96)	5213	7.15 (6.84, 7.48)	1663	6.09 (5.69, 6.51)	613	6.04 (5.45, 6.69)	< 0.001
≥ 2 drug use	8320	6.67 (6.47, 6.87)	6039	7.75 (7.49, 8.02)	1743	5.56 (5.18, 5.97)	538	4.37 (3.92. 4.87)	< 0.001
Substance use disorder[†]	*n*	% (95% CI)	*n*	% (95% CI)	*n*	% (95% CI)	*n*	% (95% CI)	
Any drug	3459	2.77 (2.63, 2.91)	2370	2.96 (2.81, 3.12)	803	2.61 (2.33, 2.92)	286	2.29 (1.94, 2.71)	0.01
Any drug, excluding cannabis	1851	1.64 (1.53, 1.75)	1146	1.54 (1.42, 1.67)	489	1.74 (1.54, 1.96)	216	1.85 (1.55, 2.20)	0.07
Cannabis	1960	1.39 (1.30, 1.49)	1454	1.69 (1.57, 1.81)	412	1.16 (0.99, 1.36)	94	0.65 (0.48, 0.87)	< 0.001
Cocaine	364	0.35 (0.30, 0.42)	244	0.36 (0.30, 0.43)	89	0.39 (0.29, 0.53)	31	0.26 (0.15, 0.50)	0.31
Inhalants	30	0.02 (0.01, 0.04)	19	0.03 (0.01, 0.05)	6	0.01 (0.01, 0.04)	5	0.04 (0.01, 0.16)	0.47
Methamphetamine	350	0.30 (0.25, 0.35)	193	0.23 (0.19, 0.28)	100	0.35 (0.25, 0.48)	57	0.46 (0.33, 0.65)	0.004
Heroin	314	0.24 (0.21, 0.28)	218	0.27 (0.24, 0.32)	66	0.20 (0.14, 0.29)	30	0.21 (0.13, 0.32)	0.19
Prescription opioid	805	0.75 (0.68, 0.83)	477	0.67 (0.60, 0.76)	224	0.81 (0.69, 0.96)	104	0.95 (0.75, 1.22)	0.02
Hallucinogens	159	0.10 (0.08, 0.13)	98	0.10 (0.08, 0.14)	52	0.12 (0.09, 0.17)	9	0.05 (0.02, 0.20)	0.33
Prescription tranquilizer	275	0.24 (0.20, 0.28)	163	0.21 (0.17, 0.26)	76	0.25 (0.19, 0.33)	36	0.31 (0.20, 0.47)	0.18
Prescription sedative	64	0.05 (0.04, 0.07)	29	0.04 (0.02, 0.06)	23	0.07 (0.04, 0.11)	12	0.10 (0.04, 0.23)	0.12
Prescription stimulant	245	0.19 (0.16, 0.23)	143	0.17 (0.14, 0.21)	74	0.22 (0.17, 0.30)	28	0.22 (0.13, 0.40)	0.34

All percentages are weighted

*The National Survey on Drug Use and Health queries 10 major chronic conditions that include heart conditions, diabetes, chronic bronchitis/chronic obstructive pulmonary disease, cirrhosis, hepatitis B or C, kidney disease, asthma, HIV/AIDS, cancer, and high blood pressure (hypertension)

†Based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition[3]

‡We utilized a Holm statistical correction[4] for past-year substance use and substance use disorder variables. Although we present unadjusted p values, methamphetamine use and sedative misuse only approached significance given the correction so we do not interpret these two tests as being significant. For substance use disorder, only cannabis and methamphetamine use disorders remained significant with p < 0.05 after correction

public health implications. The lower prevalence of substance use among adults with multimorbidity may be because younger adults are less likely to have chronic conditions, and some of those with multimorbidity may have stopped using substance due to illness.[6]

These results identify a potentially high-risk population with medical multimorbidity and polysubstance use (substance, AUD, and/or tobacco dependence), which has important health implications. The finding of higher prevalence of methamphetamine use disorder among adults with multimorbidity requires further study and is not described in the literature. Substance use and substance use disorder among adults with multimorbidity also needs to be better explored by disease type.

Table 2 Correlates of Past-Year Substance Use Among Adults with Multimorbidity—United States 2015–2016

Characteristic	Odds ratio	(95% CI)	*p* value	Adjusted odds ratio	(95% CI)	*p* value
Age group						
18–34	1.00			1.00		
35–49	0.44	(0.37, 0.52)	< 0.001	0.51	(0.41, 0.61)	< 0.001
50–64	0.29	(0.24, 0.35)	< 0.001	0.37	(0.29, 0.49)	< 0.001
≥ 65	0.09	(0.07, 0.13)	< 0.001	0.15	(0.11, 0.22)	< 0.001
Sex						
Male	1.00			1.00		
Female	0.86	(0.74, 1.02)	0.08	0.78	(0.64, 0.95)	0.01
Race/ethnicity						
Non-Hispanic White	1.00			1.00		
Non-Hispanic Black/African American	1.27	(0.97, 1.66)	0.09	0.99	(0.75, 1.30)	0.94
Hispanic	1.15	(0.88, 1.52)	0.30	0.84	(0.63, 1.13)	0.25
Non-Hispanic Asian	0.86	(0.36, 2.01)	0.72	0.78	(0.33, 1.87)	0.58
Other	1.31	(0.94, 1.82)	0.11	1.02	(0.74, 1.42)	0.89
Total family income						
< $20,000	1.00			1.00		
$20,000–$49,999	0.59	(0.47, 0.73)	< 0.001	0.81	(0.62, 1.05)	0.11
$50,000–$74,999	0.49	(0.35, 0.69)	< 0.001	0.73	(0.51, 1.04)	0.08
≥ $75,000	0.51	(0.41, 0.64)	< 0.001	0.75	(0.57, 0.98)	0.04
Marital status						
Married	1.00			1.00		
Widowed	0.61	(0.41, 0.89)	0.01	0.89	(0.59, 1.34)	0.56
Divorced or separated	2.23	(1.73, 2.87)	< 0.001	1.70	(1.27, 2.28)	0.001
Never married	4.05	(3.18, 5.15)	< 0.001	1.98	(1.45, 2.68)	< 0.001
Tobacco use						
Nicotine dependence*	3.82	(3.22, 4.54)	< 0.001	2.51	(2.04, 3.09)	< 0.001
Alcohol use						
Alcohol use disorder†	4.49	(3.48, 5.80)	< 0.001	2.87	(2.22, 3.72)	< 0.001
Healthcare utilization						
All-cause ER use past year	1.34	(1.16, 1.55)	< 0.001	1.06	(0.90, 1.26)	0.49
Number of chronic conditions						
2 conditions	1.00			1.00		
3–4 conditions	0.97	(0.82, 1.15)	0.70	1.16	(0.97, 1.39)	0.11
≥ 5 conditions	0.57	(0.36, 0.91)	0.02	0.67	(0.39, 1.15)	0.15

Multimorbidity defined as 2 or more of the following heart conditions, diabetes, chronic bronchitis/chronic obstructive pulmonary disease, cirrhosis, hepatitis B or C, kidney disease, asthma, HIV/AIDS, cancer, and high blood pressure (hypertension)

*Based on the Nicotine Dependence Syndrome Scale (NDSS)[5]
†Based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition[3]

Substance use adds complexity to the already-challenging care of adults with multimorbidity. Adults with multimorbidity should be screened for substance use, and those with the compound comorbidity of SUD and medical disease require integrated, patient-centered approaches to care.[2]

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Compliance with Ethical Standards:

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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