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

Benjamin H. Han, MD^{1,2,3}, Roxanne Ko, BA, BS⁴, and Joseph J. Palamar, PhD^{2,3}

¹Department of Medicine, Division of Geriatric Medicine and Palliative Care, New York University School of Medicine, New York, NY, USA; ²Department of Population Health, New York University Langone Medical Center, New York, NY, USA; ³Center for Drug Use and HIV/HCV Research, NYU College of Global Public Health, New York, NY, USA; ⁴John A. Burns School of Medicine, University of Hawaii, Honolulu, HI, USA.

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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 (\geq 18 years of age) with 0, 1, and \geq 2 chronic

This work has not been presented before.

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conditions. We utilized a Holm statistical correction⁴ for pastyear 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 \geq 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 (<i>n</i> = 19,487)		>2 chronic conditions (<i>n</i> = 7915)		<i>p</i> value [‡]			
n	% (95% CI)	n	% (95% CI)	п	% (95% CI)	n	% (95% CI)				
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			
10,447	9.13 (8.84, 9.42)	7449	10.20 (9.84,	2256	8.02 (7.57, 8.49)	742	6.95 (6.30, 7.65)	< 0.001			
16,764	13.90 (13.50, 14.30)	12,389	16.40 (15.90, 16.90)	3382	11.50 (10.90,	993	8.47 (7.58, 9.45)	< 0.001			
2386	1.97 (1.84,	1790	2.42 (2.27,	494	1.67 (1.43,	102	0.75 (0.58,	< 0.001			
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			
595	0.45(0.40, 0.52)	423	0.51 (0.44, 0.58)	137	0.42 (0.33.	35	0.30 (0.17,	0.09			
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			
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			
2598	1.79 (1.66,	2019	2.28(2.13, 2.44)	504	1.42 (1.21,	75	0.53 (0.35, 0.82)	< 0.001			
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			
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			
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			
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			
n 3459	% (95% CI) 2.77 (2.63, 2.91)	n 2370	% (95% CI) 2.96 (2.81, 3.12)	n 803	% (95% CI) 2.61 (2.33, 2.92)	n 286	% (95% CI) 2.29 (1.94, 2.71)	0.01			
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			
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			
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			
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			
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			
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			
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			
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			
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			
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			
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			
	ions* Total (n 20,750 10,447 16,764 2386 686 595 446 4945 2598 2696 559 7489 8320 n 3459 1851 1960 364 30 350 314 805 159 275 64 245	ions* Total ($n = 85,701$) n % (95% CI) 20,750 18.10 (17.70, 18.60) 10,447 9.13 (8.84, 9.42) 16,764 13.90 (13.50, 14.30) 2386 1.97 (1.84, 2.12) 686 0.61 (0.55, 0.67) 595 0.45 (0.40, 0.52) 446 0.36 (0.31, 0.40) 0.400 4945 4.55 (4.36, 4.74) 2598 1.79 (1.66, 1.93) 2696 2.34 (2.21, 2.48) 559 0.60 (0.54, 0.67) 7489 6.70 (6.45, 6.96) 8320 6.67 (6.47, 6.87) n % (95% CI) 3459 2.77 (2.63, 2.91) 1851 1.64 (1.53, 1.75) 1960 1.39 (1.30, 1.49) 364 0.35 (0.30, 0.42) 30 0.02 (0.01, 0.04) 0.55 0.35) 314 0.24 (0.21, 0.28) 805 0.75 (0.68, 0.83) 159 0.10 (0.08, 0.13) 275 0.24 (0.20, 0.28)	ions*Total $(n = 85,701)$ 0 chron $(n = 58,2)$ n % (95% CI) n 20,75018.10 (17.70, 15,01018.60)10,4479.13 (8.84, 74499.42)16,76413.90 (13.50, 12,38914.30)23861.97 (1.84, 17902.12)6860.61 (0.55, 4060.67)5950.45 (0.40, 4230.52)4460.36 (0.31, 3090.40)49454.55 (4.36, 33924.74)25981.79 (1.66, 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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 Edition3

#We utilized a Holm statistical correction4 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)	<i>p</i> value	Adjusted odds ratio	(95% CI)	<i>p</i> 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					
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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Corresponding Author: Benjamin H. Han, MD; Department of Medicine, Division of Geriatric Medicine and Palliative Care New York University School of Medicine, New York, NY, USA (e-mail: Benjamin. Han@nyumc.org).

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Compliance with Ethical Standards:

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