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Title
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Multimorbidity and Inpatient Utilization Among Older Adults with Opioid Use Disorder in New York City

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BACKGROUND: Nationally, there is a sharp increase in older adults with opioid use disorder (OUD). However, we know little of the acute healthcare utilization patterns and medical comorbidities among this population.

OBJECTIVE: This study describes the prevalence of chronic conditions, patterns of inpatient utilization, and correlates of high inpatient utilization among older adults with OUD in New York City (NYC).

DESIGN: Retrospective longitudinal cohort study.

PARTICIPANTS: Patients aged ≥55 with OUD hospitalized in NYC in 2012 identified using data from New York State's Statewide Planning and Research Cooperative System (SPARCS).

MAIN MEASURES: The prevalence of comorbid substance use diagnoses, chronic medical disease, and mental illness was measured using admission diagnoses from the index hospitalization. We calculated the ICD-Coded Multimorbidity-Weighted Index (MWI-ICD) for each patient to measure multimorbidity. We followed the cohort through September 30, 2015 and the outcome was the number of rehospitalizations for inpatient services in NYC. We compared patient-level factors between patients with the highest use of inpatient services (≥7 rehospitalizations) during the study period to low utilizers. We used multiple logistic regression to examine possible correlates of high inpatient utilization.

KEY RESULTS: Of 3669 adults aged ≥55 with OUD with a hospitalization in 2012, 76.4% (n=2803) had a subsequent hospitalization and accounted for a total of 22,801 rehospitalizations during the study period. A total of 24.7% of the cohort (n=906) were considered high utilizers and had a higher prevalence of alcohol and cocaine-related diagnoses, congestive heart failure, diabetes, schizophrenia, and chronic obstructive pulmonary disease. Multivariable predictors of high utilization included being a Medicaid beneficiary (adjusted odds ratio [aOR]=1.70, 95% confidence interval [CI]=1.37–2.11), alcohol-related diagnoses (aOR=1.43, 95% CI: 1.21–1.69), and increasing comorbidity measured by MWI-ICD (highest MWI-ICD quartile: aOR=1.98, 95% CI=1.59–2.48).

CONCLUSIONS: Among older adults with OUD admitted to the hospital, multimorbidity is strongly associated with high inpatient utilization.

KEY WORDS: readmissions; opioid use disorder; multimorbidity; geriatrics.

INTRODUCTION

Given the aging of the United States (US) population and high rates of substance use disorders (SUD) among the Baby Boomer generation, there is a growing population of older adults with SUD.[1] As a result, there is an increased number of older adults in SUD treatment,[2] particularly entering opioid treatment programs (OTP). Nationally from 2004 to 2015, there was a 41.2% increase in first-time treatment admission for opioid use disorder (OUD) among adults age ≥55,[3] and in New York City (NYC), adults ages 50 to 59 in OTP increased by 425% and those age ≥60 increased by 713% from 1996 to 2012.[4] Older adults with SUD are medically complex,[5] and their health needs will increasingly place demands on our healthcare system.[6] A recent study of older Medicare beneficiaries found greater medical complexity for selected comorbidities among patients with OUD-related hospitalization than those hospitalized for non-OUD reasons.[7] The implications for an older population with co-occurring SUD and multiple chronic diseases are high acute healthcare utilization and an increased risk for institutionalization.

Older adults who are frequently hospitalized represent a high-cost patient population,[8] with a high prevalence of medical comorbidities and functional impairments.[9] Hospitalizations for OUD increased from 38.3 per 100,000 in 1993 to 154.5 per 100,000 in the US, [10] and for adults age ≥65 opioid-related inpatient stays have increased 54.4% from 2010 to 2015.[11] However, there is an absence of data on the patterns of inpatient utilization including admission comorbidities for older adults with OUD. The intersection of substance use with

chronic disease is complex[12] as substance use can exacerbate chronic disease, which often necessitates hospitalization. Furthermore, with the increase in older adults with OUD entering OTPs,[3,4] there will likely be an increase in the number of patients with stable OUD hospitalized for other co-occurring chronic diseases. Therefore, we hypothesize that older adults with OUD will frequently be hospitalized with increasing odds for hospitalization with a higher burden of chronic disease.

A better understanding of this growing population's healthcare needs has important implications for patients and healthcare systems. This study's objective was to describe comorbid conditions and patterns of rehospitalizations among older adults with OUD hospitalized in NYC. In addition, we identify distinguishing characteristics of older adults with OUD with high inpatient utilization compared to those with low utilization.

METHODS

Study Design and Data Sources

We performed a retrospective observational longitudinal cohort analysis of patients age ≥55 with OUD admitted to hospitals in NYC. This study used data from the New York State Department of Health's Statewide Planning and Research Cooperative System (SPARCS) database. SPARCS is a comprehensive all-payer data reporting system established in 1979 and maintains discharge records of all inpatient hospitalizations for all hospitals in New York State except for Veterans Health Administration hospitals.[13] We used a SPARCS database limited to NYC hospitals.

Cohort Selection

We derived our cohort from individuals age ≥55 hospitalized between January 1, 2012 and December 31, 2012, with an admission diagnosis (primary or secondary up to 25 diagnosis fields) of OUD. We defined OUD using the International Statistical Classification of Diseases and Related Health Problems, Ninth Revision Clinical Modification (ICD-9) diagnosis codes for opioid abuse (30550-2) or opioid dependence (30400-2, 30470-2) as defined by Heslin et al.[14] Previous studies have used this approach to identify hospitalized patients with OUD.[10,15–17] We excluded patients who were not NYC residents based on home zip codes and patients who died during a subsequent NYC hospitalization.

Covariates

We described sociodemographic characteristics (age, sex, race/ethnicity, and neighborhood poverty) from information provided from the index hospitalization and included these as covariates in this analysis. SPARCS collects data on race and Hispanic ethnicity separately; however, we utilized a race/ethnicity variable with the following four categories: Hispanic, Black, White, and Other. When Hispanic was noted under SPARCS ethnicity, the designation for the individual was

assigned Hispanic, if not, then the race variables were used. We defined neighborhood poverty from zip code of residence as the percent of residents with incomes below 100% of the federal poverty level per American Community Survey and Census 2000.[18] This study categorized neighborhood poverty into four groups: low (< 10% of residents below poverty), medium (10 to < 20% below poverty), high (20 to <30% below poverty), and very high (≥30% below poverty). We also categorized insurance status based on if the patient was a Medicaid beneficiary and homelessness based on the ICD-9 code V60.0 ("Lack of housing").

We measured chronic diseases by use of the ICD-coded multimorbidity-weighted index (MWI-ICD) from claims data.[19] The MWI is a comprehensive, validated person-centered measure that weights 81 chronic diseases and conditions by their impact on physical health-related quality of life and is associated with future physical and cognitive functioning and mortality risk, among other outcomes.[19,20] For reference, a nationally representative population of U.S. adults aged ≥51 with a mean age of 64.7 (SD 10.7) years had a mean MWI score of 4.7 (SD 4.5)[19] and the highest quartile of MWI-ICD scores among an older Medicare-eligible population (mean age 75.5 years, SD 8.5) was found to be strongly associated with mortality.[20] For this study, we calculated the MWI-ICD from all available ICD-9 codes based on primary or secondary admission diagnoses (up to 25 diagnoses) from the index hospitalization. The MWI-ICD was further categorized by quartiles as used in the literature.[20] Furthermore, select chronic diseases were included as covariates, including acute myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic obstructive pulmonary disease (COPD), diabetes, renal disease, cancer, and HIV/AIDS. We chose these chronic diseases given their relevance for older adults and association with high healthcare utilization.[8,21]

Also included in our analysis were comorbid substance use diagnoses, including ICD-9 codes for cocaine (abuse, dependence, or poisoning), cannabis (abuse or dependence), and alcohol (dependence syndrome, abuse, withdrawal, toxic effect of ethyl alcohol, and alcohol-related pellagra, polyneuropathy, cardiomyopathy, gastritis, hepatitis, and liver damage). Mental illness comorbidity was also included using standard ICD-9 codes for schizophrenia-spectrum disorders, bipolar-spectrum disorders, and depressive disorders. Finally, we included in our analysis discharge disposition, including discharge to home, skilled nursing facility, or if a patient was discharged against medical advice (DAMA) during the index hospitalization and defined if the patient voluntarily left the hospital before completing medical treatment.

Outcome

We defined the index hospitalization for each patient utilizing the Centers for Medicare and Medicaid Services' methodology of hospitalizations that resulted in a live discharge (patient

did not die during hospitalization)[13] and was the patient's first hospitalization from January 1, 2012, to December 31, 2012. Readmissions were all-cause hospitalizations from January 1, 2012, through September 30, 2015; the end date was chosen due to the transition from ICD-9 to ICD-10 on October 1, 2015. Transfer admissions were not considered readmissions, while same-day readmissions were considered readmissions. We excluded hospitalizations (both index and readmissions) specific for detoxification or drug/alcohol rehabilitation to focus on inpatient medical hospitalizations.

Statistical Analysis

For each patient, the number of rehospitalizations was measured during the study period and the timing of the first rehospitalization calculated. To define the highest use of inpatient services, we used a cutoff of the top 5% of patients with rehospitalizations from all NYC patients hospitalized and discharged alive in 2012 and followed through the same study period, which correlated to 7 or more hospitalizations during the study period. The top 5% is a commonly used threshold to define high healthcare utilizers in the literature.[22,23] Patients were then categorized as low use of inpatient services (<7 rehospitalizations) or high use of inpatient services (≥7 rehospitalizations). Descriptive patient-level factors were compared between adults with high-use versus low-use hospitalizations using bivariate analysis. Binary logistic regression models estimated the crude odds ratio (OR) of each covariate. Multivariable logistic regression was performed to give an adjusted OR (aOR) to determine associations between covariates and patients with high use of inpatient services simultaneously adjusting for age (stratified), sex, race/ethnicity, neighborhood poverty, Medicaid beneficiary, homelessness, MWI-ICD (in quartiles), comorbid substance use diagnosis, and DAMA on index hospitalization. Inclusion of variables in the multivariable models was based on findings from the prior literature and theory.[7,8] Because individual chronic conditions are included in the MWI-ICD, specific chronic diseases (including mental illness comorbidity) were not included in the model. Sensitivity analysis was also performed removing any patient with a primary diagnoses code of OUD on index hospitalization. The SPARCS system requires specific fields to be populated before submission to New York State; therefore, missing data was rare and limited to <0.2% for all variables analyzed. All data were analyzed using SAS 9.2 (SAS Institute, Cary, NC, USA). This study of de-identified data was exempted from institutional board review as it was considered routine public health surveillance.

RESULTS

Baseline Characteristics

Table 1 shows the baseline characteristics for the cohort of patients with OUD age 55 and older with hospitalization in

2012 (n=3669). The mean age was 60.7 years (SD 5.2), and the majority were males (66.1%), Medicaid beneficiaries (78.5%), and residents of high poverty neighborhoods (51.3%). In terms of chronic diseases, more than one-third had COPD (36.5%) and more than one-quarter had diabetes (26.9%), with a mean MWI-ICD of 7.4 (SD 5.4). Regarding other substance use, individuals with concurrent alcohol-related diagnoses made up 27.2% of the cohort and depressive disorders 15.9%. On discharge, most patients (64.2%) were discharged home and 7.9% were DAMA.

Table 1 Baseline Characteristics of Older Adults with Opioid Use Disorder with Hospitalization in New York City in 2012

	Patients with opioid use disorder with hospitalization in 2012 (n=3669), n (%)
Opioid use disorder as primary admission diagnosis	111 (3.0)
Age	
Age, mean (SD)	60.7 (SD 5.2)
Age, median	59.0
Age range	55–84 years
Sex	
Male	2424 (66.1)
Female	1245 (33.9)
Race/ethnicity	
Black	1249 (34.0)
Hispanic	993 (27.1)
White	734 (20.0)
Other	693 (18.9)
Neighborhood poverty	
< 10%	239 (6.5)
10 to <20%	938 (25.6)
20 to <30%	606 (16.5)
30 to 100%	1882 (51.3)
Homeless	188 (5.1)
Medicaid beneficiary	2880 (78.5)
Comorbid substance use diagnoses	
Alcohol-related diagnoses	997 (27.2)
Cocaine-related diagnoses	551 (15.0)
Marijuana-related diagnoses	148 (4.0)
Comorbid chronic disease diagnoses	
Acute myocardial infarction	209 (5.7)
Congestive heart failure	386 (10.5)
Peripheral vascular disease	171 (4.7)
Cerebrovascular disease	172 (4.7)
Dementia	128 (3.5)
Chronic obstructive pulmonary disease	1340 (36.5)
Diabetes mellitus	985 (26.9)
Renal disease	472 (12.9)
Cancer	368 (10.0)
HIV/AIDS	389 (10.6)
Multimorbidity-weighted index (MWI-ICD)	
Mean (SD)	7.4 (SD 5.4)
Median	6.3
Range (min–max)	0–33.9
Mental illness	
Schizophrenia-spectrum disorders	267 (7.3)
Bipolar-spectrum disorders	204 (5.6)
Depressive disorders	582 (15.9)
Discharge disposition	
Discharged home	2357 (64.2)
Discharged to skilled nursing facility (SNF)	296 (8.1)
Discharged against medical advice	289 (7.9)

Rehospitalization Patterns

Table 2 shows the rehospitalization patterns of this cohort during the study period. Of the cohort of 3669 patients, 2803 patients (76.4%) had a rehospitalization and accounted for a total of 22,801 rehospitalizations with a mean number of 5.0 (SD 8.1) rehospitalizations. Of the 2803 patients, the first rehospitalization occurred within 30 days for 24.4%; for 36.7%, it occurred between 31 and 180 days, and for 38.9% it occurred after 180 days.

Characteristics and Correlates of High Inpatient Utilizers

Patients with high use of inpatient services (n=906, 24.7% of study the cohort) were different from patients with low use of inpatient services (n=2763, 75.3% of the study cohort) (Table 3). High utilizers compared to low utilizers were more likely to be a Medicaid beneficiary (85.1% vs. 76.3%), and have alcohol-related diagnoses (33.8% vs. 25.0%), cocaine-related diagnoses (17.3% vs. 14.3%), schizophrenia (10.0% vs. 6.4%), congestive heart failure (15.3% vs. 8.9%), COPD (42.7% vs. 34.5%), diabetes (32.6% vs. 25.0%), and renal disease (16.2% vs. 11.8%). Patients with high use also had a higher mean MWI-ICD of 8.4 (SD 5.5) vs. 7.1 (SD 5.3).

In our adjusted models, patients with high inpatient utilization had higher odds of being a Medicaid beneficiary (aOR=1.70, 95% confidence interval [CI]=1.37–2.11) and have alcohol-related diagnoses (aOR=1.43, 95% CI=1.21–

1.69). We noted that the higher the MWI-ICD score, the stronger the association with high inpatient utilization with the highest quartile of MWI-ICD having an aOR=1.98 (95% CI=1.59–2.48). Removing patients with a primary diagnosis code of OUD from the index hospitalization (n=111) did not change our findings (Supplemental Table 1).

DISCUSSION

Using NYC hospitalization claims data of a large cohort of older patients, we report co-occurring chronic diseases among hospitalized patients with OUD and associations of high utilization of inpatient services. Our study of older adults with OUD confirms previous studies that show high prevalence of a variety of chronic diseases, including diabetes, COPD, and mental illness.[7,24–26] However, this study adds a more comprehensive and granular examination of additional chronic diseases and the use of the validated MWI-ICD to examine how the extent of multimorbidity and physical functioning might be an important factor in high inpatient utilization for patients with OUD. We found a higher prevalence of certain medical diseases among patients with high inpatient utilization, including congestive heart failure and diabetes, both previously identified as top diagnoses of readmissions nationally.[27] These findings have implications for this population's risk for future long-term physical and cognitive decline and risk for all-cause mortality.[20,28]

In addition to increasing odds for readmissions with a higher MWI-ICD score, we found higher prevalence of schizophrenia and alcohol-related diagnoses among high-utilizer patients with OUD, both also commonly listed as top diagnoses associated with readmissions and high healthcare utilization in the US.[23,29] Taken together, our study suggests that high inpatient utilization among older adults with OUD is associated with multimorbidity. OUD, itself a chronic disease, along with co-occurring chronic medical and psychiatric diseases, may place individuals at higher odds for readmission as we report in this study. OUD adds complexity to the already challenging care of older adults with multimorbidity who already have high rates of hospitalizations and readmissions.[30] Our finding suggests the need for studies to examine integrated, patient-centered care models for older patients with OUD who also have other chronic diseases to reduce hospitalizations.

Many barriers exist for managing chronic diseases among people with SUD, including the stigma of drug use and drug use treatment in medical care. In addition, many addiction medicine settings, including OTPs, do not provide chronic disease management, let alone specialized care for older adults. Integrating primary care into SUD treatment settings such as OTP is an appealing way to address chronic diseases with SUD treatment in a centralized location.[31,32] Two systematic reviews focusing on integrating medical care and substance use treatment; however, note the low quality of

Table 2 Rehospitalization Patterns Among Older Adults with Opioid Use Disorder, New York City 2012–2015

	Patients with opioid use disorder with hospitalization in 2012 (n=3669), n (%)
Total number of rehospitalizations	22,801
Range of number of rehospitalizations	0-223
Mean number of rehospitalizations (sd)	5.0 (SD 8.1)
Median number of rehospitalizations	2.0
Number of rehospitalizations	
0	866 (23.6)
1	578 (15.8)
2	409 (11.2)
3	332 (9.1)
4	238 (6.5)
5	193 (5.3)
6	147 (4.0)
7	137 (3.7)
8	127 (3.5)
9	80 (2.2)
10	77 (2.1)
11	65 (1.8)
12	62 (1.7)
13	50 (1.4)
14	31 (0.8)
≥15	277 (7.6)
Timing for first rehospitalization (n=2803, 76.4%)	
Rehospitalization ≤30 days	684 (24.4)
Rehospitalization between 31 and ≤180 days	1030 (36.7)
Rehospitalization >180 days	1089 (38.9)

Table 3 Differences Between High and Low Inpatient Use Among Older Adults with Opioid Use Disorder with Hospitalization, New York City 2012–2015

	Low use of inpatient services (*n*=2763)		High use of inpatient services (*n*=906)		X^2 *p*-value	Adjusted odds ratio	(95% CI)	*p*-value
Age								
Age, mean (SD)	60.8 (SD 5.3)		60.3 (SD 4.8)		0.01			
Age 55–65	2232	80.8%	759	83.7%		Ref	Ref	Ref
Age 65+	531	19.2%	147	16.2%	0.04	0.84	0.68-1.04	0.10
Gender								
Male	1831	66.3%	593	65.5%	0.65	0.96	0.81–1.13	0.58
Female	932	33.7%	313	34.6%		Ref	Ref	Ref
Race/ethnicity								
Black	932	33.7%	317	35.0%	0.84	0.85	0.68–1.08	0.18
Hispanic	747	27.0%	246	27.2%		0.84	0.66–1.07	0.16
White	554	20.1%	180	19.9%		Ref	Ref	Ref
Other	530	19.2%	163	18.0%		0.78	0.60–1.02	0.07
Neighborhood poverty								
<10%	183	6.6%	56	6.2%	0.70	Ref	Ref	Ref
10 to <20%	708	25.6%	230	25.4%		0.98	0.70–1.38	0.91
20 to <30%	468	16.9%	138	15.2%		0.85	0.59–1.23	0.40
30 to 100%	1401	50.7%	481	53.1%		0.98	0.70–1.38	0.91
Homeless	139	5.0%	49	5.4%	0.65	1.13	0.80-1.60	0.50
Medicaid beneficiary	2109	76.3%	771	85.1%	<0.001	1.70	1.37–2.11	<0.001
Co-morbid substance use diagnoses								
Alcohol-related diagnoses	691	25.0%	306	33.8%	<0.001	1.43	1.21–1.69	<0.001
Cocaine-related diagnoses	394	14.3%	157	17.3%	0.02	1.23	0.99–1.52	0.06
Marijuana-related diagnoses	111	4.0%	37	4.1%	0.93	0.96	0.65–1.44	0.86
Co-morbid chronic disease diagnoses								
Acute myocardial infarction	149	5.4%	60	6.6%	0.17			
Congestive heart failure	247	8.9%	139	15.3%	<0.001			
Peripheral vascular disease	126	4.6%	45	5.0%	0.61			
Cerebrovascular disease	139	5.0%	33	3.6%	0.09			
Dementia	105	3.8%	23	2.5%	0.07			
Chronic obstructive pulmonary disease	953	34.5%	387	42.7%	<0.001			
Diabetes mellitus	690	25.0%	295	32.6%	<0.001			
Renal disease	325	11.8%	147	16.2%	<0.001			
Cancer	291	10.5%	77	8.5%	0.08			
AIDS/HIV	290	10.5%	99	10.9%	0.71			
Multimorbidity-weighted index (MWI-ICD)								
Mean (SD)	7.1 (SD 5.3)		8.4 (SD 5.5)		<0.001			
Range (min–max)	0–31.9	0–33.9						
0–3.75	812	29.4%	180	19.9%	<0.001	Ref	Ref	Ref
3.76–6.68	740	26.8%	210	23.2%		1.26	1.00–1.57	0.05
6.69–10.69	637	23.1%	255	28.2%		1.69	1.35–2.11	<0.001
10.79–35.88	574	20.8%	261	28.8%		1.98	1.59–2.48	<0.001
Mental illness								
Schizophrenia-spectrum disorders	176	6.4%	91	10.0%	<0.001			
Bipolar-spectrum disorders	148	5.4%	56	6.2%	0.35			
Depressive disorders	431	15.6%	151	16.7%	0.45			
Discharged against medical advice	205	7.4%	84	9.3%	0.07	1.29	0.98–1.69	0.07

current evidence and emphasize that it is unclear who benefits.[33,34] With the growing population of older adults with OUD, we believe that the approach of integrating chronic disease management with addiction treatment must adopt the principles of geriatric-based care. This includes focusing on maintaining function and independence, quality of life, and the expert management of chronic diseases in a patient-centered, team-based approach in the setting of complexity and competing risks.[35–37] A geriatric-based approach may reduce acute healthcare utilization and readmissions in this population by addressing multimorbidity, but future studies are needed.

Our study also examined social factors central to high inpatient utilization among older patients with OUD. We found a strong association between high utilizers and being a Medicaid beneficiary, which is consistent with other studies of patients with high numbers of inpatient admissions.[8,38] However, we did not find any associations in our adjusted models of high utilization with demographic characteristics, neighborhood poverty, or homelessness, contrary to findings from prior studies.[8,39,40] This may suggest the broader role of complex multiple chronic diseases among older adults with OUD that drives frequent hospitalizations over social factors.

This study has several important limitations. First, we acknowledge that our strategy for cohort selection for OUD (ICD-9 codes for opioid abuse or dependence), while used in a range of other studies,[10,14–16] may have low specificity for capturing OUD. More specific algorithms have been developed to identify patients with OUD[41]; however, we were

unable to follow this approach given the limitations of the SPARCS database available to us. So, it is possible our study includes patients who may not have OUD and thus underestimates the real impact of OUD on inpatient utilization. Second, we could not link our cohort to death records, and while we removed patients with known subsequent death during a re-hospitalization in a NYC hospital, our cohort may have patients that died at home, a nursing facility, or outside of NYC. An outside of hospital death shortly after index hospitalization would prevent a patient from becoming a high utilizer (or they could have been a high utilizer before death) and therefore introduce bias. For example, we found that high utilizers had a lower prevalence of dementia and cancer, and such patients typically have shorter life expectancies and therefore may have died shortly after hospitalization. However, it could also mean that such patients were already established with geriatric or palliative care and a focus of their care was to minimize hospitalizations. Next, this study relies on diagnosis codes of the index hospitalization admission, which is likely an underestimate of a patient's medical conditions and mental illnesses. Also, for co-occurring substance use, we were limited to cannabis, alcohol, and cocaine-related diagnoses due to the unreliability of other substance use codes (i.e., benzodiazepines) found during preliminary analysis. Furthermore, there is heterogeneity in coding among clinicians and hospitals, which is inherent in all studies using administrative data. In addition, we used the ICD-9 code to capture patients who are experiencing homelessness; however, this may be miscategorized due to inconsistent screening practices for homelessness and provider variation in identifying homelessness. Therefore, our study likely underestimates the number of patients experiencing homelessness.[40] Additionally, the baseline cohort for this study is the calendar year of 2012, limiting generalizability to the current population of patients with OUD in NYC. However, the number of older adults with OUD increased sharply over the past 10 years,[3,4] thus likely resulting in a larger population of adults with OUD and multimorbidity,[7] making this study more relevant. Finally, our study is limited to NYC, and results from this study may not be generalizable to other cities.

In NYC, among older adults with OUD admitted to the hospital, multimorbidity was associated with high inpatient utilization. Given the high prevalence of co-occurring chronic disease, mental illness, and substance use, a multimorbidity framework is needed to better address all patient-relevant health outcomes for older patients with OUD. Integrating geriatric-based care with addiction medicine should be a priority for this growing population to address all healthcare needs through patient-centered care. Finally, addressing multimorbidity in the outpatient setting, especially after a hospital discharge, is imperative to reduce acute healthcare utilization in this population.

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Declarations:

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

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