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ORIGINAL ARTICLE

Trends in Hospital Discharges and Dispositions for Episodes of Co-occurring Severe Mental Illness and Substance Use Disorders

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Abstract This study examined trends in general hospital discharges and dispositions involving episodes of severe mental illness (SMI) with and without co-occurring substance use disorders. We analyzed data from the National Hospital Discharge Survey from 1979 through 2008. Discharges involving SMI and co-occurring substance use disorders (COD) were associated with shorter lengths of stay and had a greater likelihood of being discharged routinely or home and reduced likelihood of being transferred to a short- or long-term facility. Although COD discharges had a greater odds of leaving against medical advice than SMI discharges, this effect was not significant over time. A greater understanding of hospital discharge planning practices is needed to ensure that patients are linked to appropriate aftercare services.

Keywords Co-occurring disorders · Hospital admissions · Length of stay · Discharge status

Introduction

The co-occurrence of mental health and substance use disorders is highly prevalent and places a significant burden on individuals, families, and society. Epidemiological studies suggest that approximately one-half of individuals with severe mental illness have a lifetime substance use disorder, a rate that is three times higher than the general population (Epstein et al. 2004; Kessler et al. 1994; Mueser et al. 1990). Clinical studies suggest that up to 60 percent of individuals with severe mental illness have a co-occurring substance use disorder (Grant et al. 2004; Harris and Edlund 2005; Kessler et al. 1996; Narrow et al. 2000).

Individuals with co-occurring disorders are associated with multiple adverse outcomes, including treatment drop-out (Cuffel 1996), recurrent hospitalization (Graham et al. 2001; Hunt et al. 2002; Lambert et al. 2005), homelessness (Caton et al. 1994), incarceration (Abram and Teplin 1991), relapse (Swofford et al. 1996), victimization (Goodman et al. 1997), as well as chronic medical conditions such as HIV and hepatitis (Rosenberg et al. 2005). The course of substance use disorders among those with severe mental illness is often chronic and marked by cycles of relapse and recovery (Chouljian et al. 1995; Margolese et al. 2006).

Given the complicated nature of co-occurring disorders, the provision of integrated mental health and substance use treatment services is critical. Yet, funding for both mental health and substance abuse treatment is limited and continues to decline (O'Brien et al. 2004). The shift in emphasis to community-based care as a result of deinstitutionalization has broadened the forms and locations of treatments offered. These changes have altered how behavioral health care is financed, which have tended to spread the costs of treatment more broadly. There is concern that these changes have led to fragmentation of services and deficiencies in the availability of specialty care, especially for persons with co-occurring disorders, who are among those at greatest risk for treatment dropout and adverse outcomes.

Many persons with co-occurring problems receive services covered by public insurance or safety net programs.

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The funding mechanisms for these programs are complicated and likely impede the integration and coordination of mental health and substance abuse services (Croft and Parish 2013). Publicly funded substance abuse treatment programs are often separated from mental health treatment programs (Buck 2011). As a result, persons with co-occurring disorders have difficulty navigating a complicated system with disparate services and limited communication and coordination of care across providers (Pincus et al. 2007). Epidemiological studies highlight the lack of access and use of services in this population. For example, a 2005 population-based survey found only 8.5 % of adults with severe psychological distress and a co-occurring substance use disorder received any treatment for either problem in the prior 12 months (SAMHSA 2006). Even those who receive treatment may continue to experience significant impairment due to fragmented services (Havassy et al. 2009). Such fragmentation is associated with poor quality of services and worse outcomes for persons with co-occurring disorders (Horvitz-Lennon et al. 2006).

The impact of these changes on psychiatric hospitalizations over time is not well understood, especially for individuals with co-occurring disorders. Given the emphasis on community care alternatives, along with managed care, we might expect a decrease in hospitalizations and length of stay. The above concerns in accessing and navigating mental health and substance abuse services, however, may result in higher rates of hospitalization. Glied and Frank (2009) present evidence from several national datasets that suggest a decreasing trend in the use of outpatient mental health treatment and an increasing trend in hospitalizations among persons with severe mental illness between 2000 and 2006 compared with earlier years. Other studies have suggested increasing trends in hospitalizations, albeit separately for patients with SMI and those with co-occurring disorders (Maynard and Cox 1998; Mechanic et al. 1998; Watanabe-Galloway and Zhang 2007; Weber et al. 2009). Findings from prior studies comparing hospital length of stay between those with and without co-occurring disorders are mixed, warranting further exploration (Ding et al. 2011; Hunt et al. 2002; Maynard and Cox 1998; Mechanic et al. 1998).

In this article, we used national data to examine long-term trends in general hospital discharges and dispositions of discharge episodes involving severe mental illness (SMI) with and without co-occurring substance use disorders.

Method

Data Source

We analyzed National Hospital Discharge Survey (NHDS) data from 1979 to 2008. The National Center for Health Statistics (NCHS) has conducted the NHDS annually from 1965 to 2010. The NHDS is the primary national data source for inpatient hospital utilization from an annual sample of approximately 300,000 patient discharge records from 500 nonfederal, noninstitutional, short-stay (average stay of less than 30 days) hospitals in 50 states and the District of Columbia. Excluded from the survey are: federal, military, and Department of Veterans Affairs hospitals; institutional hospitals (e.g., prisons); and hospitals with fewer than six beds. The NHDS does not include data on ambulatory or outpatient services or emergency visits. The NHDS uses a stratified, multistage probability design, which enables users to generate national and regional estimates of patient characteristics, diagnoses, hospital characteristics and procedures, source of payment, geographic region, length of stay, and discharge disposition. In 1988, the NHDS underwent a major redesign of the sampling method from a two-stage model to a three-stage model. It is important to note that data observed from the survey represent hospital discharges, not patients, because a patient may have more than one discharge per calendar year. The likelihood of a patient's record being selected multiple times as part of a hospital's sample is less than 1 % (Weber et al. 2009).

Data Extraction and Coding

This study was approved as exempt by the institutional review board at Virginia Commonwealth University. We used the public use data and documentation files from 1979 to 2008 ($N = 6{,}432{,}081$ unweighted hospital discharges). We identified discharges of patients aged 18 years or older with a severe mental illness and co-occurring substance abuse or dependence by extracting records for which the diagnosis was a code from the *International Classification of Diseases* (ICD-9-CM). We used methods congruent with the study by Weber et al. (2009) and defined severe mental illness from records with at least one of seven diagnoses of schizophrenia (295.xx), bipolar mood disorder (296.00, 296.40–296.80), major depressive disorder with psychotic features (296.24 and 296.34), delusional disorder (297.xx), or psychotic disorder NOS (298.xx). Among discharges associated with severe mental illness, our target population of interest, we identified those with a co-occurring substance use disorder. We defined substance use disorders as discharges associated with alcohol dependence (303.xx), drug dependence (304.xx), nondependent abuse of drugs or alcohol (305.xx), or alcohol (980.00) or drug poisoning (965.00–965.09, 965.8, 965.9, 967.0, 967.8, 967.9, 968.3, 968.5, 969.4, 969.5, 969.7, 969.8, 969.9, 970.8). We included the "alcohol or drug poisoning" codes because they involve substances that are often abused, such as

opiates, sedatives and hypnotics, cocaine, tranquilizers and antidepressants (Gfroerer et al. 1988).

The main outcome variables included the length of hospitalization and discharge disposition. We defined length of hospitalization as the mean days of care each patient stayed in the hospital. We defined discharge disposition according to the following categories listed on the discharge form: routine/discharge to home, transferred to a short- or long-term facility, and left against medical advice. To characterize our sample of discharges, which also served as covariates in our multivariate analyses, we examined patient demographic (age, sex, and race), access to care (source of payment), and hospital (ownership) characteristics.

Statistical Analyses

For descriptive purposes, we calculated weighted frequencies and proportions to provide population estimates of demographic, source of payment, hospital type, region, discharge disposition, and average length of stay for hospital discharges with a diagnosis of severe mental illness, a co-occurring severe mental illness and substance use disorder, and other discharges. To examine race and ethnicity, we divided the sample into non-Hispanic white and black populations since other racial and ethnic groups were too small to compare separately. In addition, we present the weighted estimates for hospital length of stay and each discharge disposition over the study period (1979–2008).

We used weighted Poisson and logistic regression models to estimate trends in hospital length of stay and discharge disposition, respectively, among hospital discharges with a co-occurring disorder compared to those with severe mental illness during the study period. We adjusted for demographic, access to care, and hospital characteristics, described above, including main effects for time (survey year) and diagnosis, and two-way interactions between these main effects. Of primary interest is the coefficient on the interaction of the COD (versus SMI) indicator with survey year. All analyses were conducted using Stata/SE, version 13.0.

Results

Based on weighted data, there were an estimated 909 million hospital discharges from 1979 to 2008. Of these discharges, approximately 21 million ($n = 21{,}525{,}176$; 2 %) were associated with a severe mental illness (SMI) and almost 5 million ($n = 4{,}846{,}399$; 0.5 %) were associated with a SMI and co-occurring substance use disorder (COD). Over time, the percentage of discharges with SMI increased from 1.28 % ($n = 575{,}289$) in 1979 to 2.96 % ($n = 983{,}194$) in 2008, decreasing temporarily in 1991 at 2.35 % ($n = 657{,}670$) and reaching a peak percentage of 3.53 % ($n = 1{,}118{,}863$) in 2005. The percentage of discharges with a COD steadily increased over time, from 0.07 % ($n = 22{,}372$) in 1979 to 1.13 % ($n = 375{,}341$) in 2008.

Demographic, Access to Care, and Hospital Characteristics

Table 1 presents the demographic information gathered for patients with a SMI diagnosis, a SMI with a co-occurring substance use diagnosis, and all other diagnoses. Among those patients with CODs, men were more represented ($n = 2{,}927{,}104$, 60.4 %) than women ($n = 1{,}919{,}295$, 39.6 %), which contrasts with a higher representation of women among SMI ($n = 12{,}487{,}237$, 58.0 %) and all other ($n = 543{,}263{,}923$, 61.5 %) diagnoses. A greater percentage of Black patients were represented among CODs ($n = 1{,}017{,}005$, 26.9 %) than SMI only ($n = 3{,}136{,}063$, 17.5 %) and among all other ($n = 99{,}233{,}562$, 13.5 %) diagnoses. Patients with CODs were younger, a majority of whom were ages 35–64 years old ($n = 2{,}872{,}191$, 59 %), compared to those with SMI and all other diagnoses. Government entities were the primary payers of care for SMI (70.0 %, $n = 14{,}793{,}448$) and COD (63.5 %, $n = 2{,}998{,}558$) visits, while they paid for the cost of care for about half of all other diagnoses (52.1 %, $n = 453{,}680{,}422$). The hospital characteristics were similar for all diagnosis groups, with non-profit hospitals serving the majority of patients.

The discharge dispositions of patients varied according to a patient's diagnosis. Patients with SMI had the highest percentage of transfer to another facility (24.2 %, $n = 4{,}762{,}806$), more than COD (11 %, $n = 505{,}678$) and all other (11 %, $n = 86{,}688{,}337$) diagnoses combined. While all reported rates of patients leaving against medical advice are relatively rare, it occurred the most frequently among patients with CODs ($n = 234{,}654$, 5.3 %). The mean ± SD length of stay for patients with CODs was 8.44 ± 10.98 days compared to 10.39 ± 13.04 days and 5.86 ± 8.19 days among those with SMI and other diagnoses, respectively.

Unadjusted Trends in Hospital Length of Stay and Discharge Disposition

As shown in Fig. 1, the mean ± SD length of stay decreased from 1979 to 2008 for all diagnostic groups, especially for patients with SMI and COD diagnoses. Patients with COD had the steepest decline of 16.3 ± 0.25.91 days in 1979 to 6.96 ± 10.82 days in 2008. A relatively steep decline was observed in the average length of stay among patients with

Table 1 Characteristics of U.S. hospital discharges, by diagnosis (1979–2008)

	Severe mental illness ($N = 21{,}525{,}176$; 2 %)		Co-occurring disorder ($N = 4{,}846{,}399$; 0.5 %)		All other ($N = 883{,}106{,}270$; 97 %)	
	n[a]	Percentage[a]	n[a]	Percentage[a]	n[a]	Percentage[a]
Sex						
Male	9,037,939	42	2,927,104	60	339,842,347	38
Female	12,487,237	58	1,919,295	40	543,263,923	62
Race						
White	14,156,667	79	2,622,605	69	606,650,853	82
Black	3,136,063	17	1,017,005	27	99,233,562	13
Other[b]	651,363	4	140,478	4	30,209,775	4
Age (years)						
18–34	5,145,299	24	1,819,416	38	226,757,180	26
35–64	10,152,182	47	2,872,191	59	315,851,845	36
65+	6,227,695	29	154,792	3	340,497,245	39
Source of payment						
Non-Government[c]	6,349,463	30	1,724,051	37	417,576,370	48
Government[d]	14,793,448	70	2,998,558	63	453,680,422	52
Hospital type						
Proprietary	3,246,867	15	723,200	15	93,558,383	11
Government	3,074,908	14	643,811	13	134,229,804	15
Non-profit, including church	15,203,401	71	3,479,388	72	655,318,083	74
Discharge disposition						
Routine/discharged home	14,424,994	73	3,716,706	83	714,425,251	88
Transferred to facility	4,762,806	24	505,678	11	86,688,337	11
Left against medical advice	504,500	3	234,654	5	7,339,082	1
Days of care (mean ± SD)	10.39 ± 13.04		8.44 ± 10.98		5.86 ± 8.19	

[a] Weighted estimates

[b] American Indian/Alaskan Native, Asian, Native Hawaiian/Pacific Islander, Multiple Race, Other

[c] Employer Sponsored Insurance, Private Insurance, Self-Pay, Other

[d] Medicare, Medicaid, Other Government

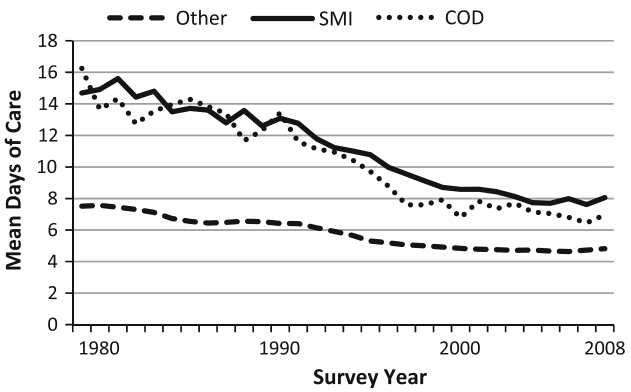

Fig. 1 Mean days of care by diagnosis group, 1979–2008

SMI, from 14.69 ± 17.92 days in 1979 to 8.06 ± 13.44 days in 2008. Patients with other diagnoses had a less substantial decline in the average length of stay, from 7.511 ± 9.60 days in 1979 to 4.82 ± 6.26 days in 2008.

Figure 2 displays the percentage of each discharge disposition by diagnosis group. Overall, rates of routine/home discharges increased over time for patients with a SMI and COD with yearly fluctuations. Routine/home discharges increased from 72.1 % ($n = 295{,}818$) in 1979 to 79.5 % ($n = 1{,}013{,}220$) in 2008 among patients with SMI and 70.3 % ($n = 16{,}427$) in 1979 to 89 % ($n = 310{,}464$) in 2008 among patients with COD, while these types of discharges decreased for patients with other diagnoses. While there was an increase in transfer discharges for other diagnoses [4.8 % ($n = 1{,}379{,}920$) in 1979 to 15.9 % ($n = 4{,}721{,}153$) in 2008], there was a modest decline in transfer discharges for patients with SMI [21.8 % ($n = 89{,}370$) in 1979 to 17.3 % ($n = 221{,}030$) in 2008] and more substantial decline for patients with COD [20.3 % ($n = 4{,}758$) in 1979 to 6.3 % ($n = 22{,}320$) in 2008]. The rate of discharges representing patients who left against medical advice fell from 6.1 % ($n = 24{,}903$) in

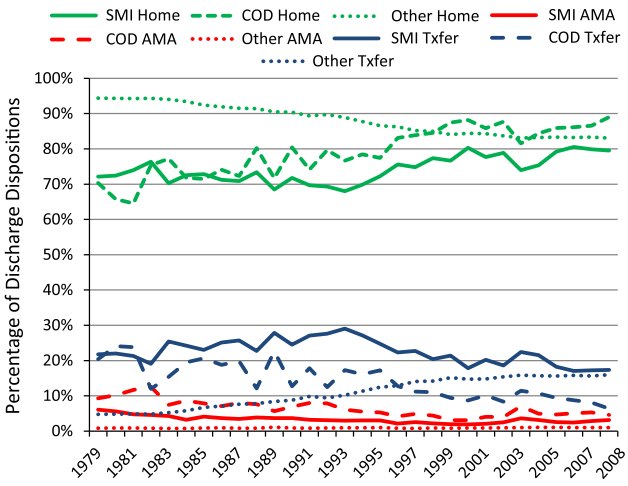

Fig. 2 Percentage of discharge dispositions by diagnosis group from 1979–2008

Table 2 Adjusted incidence rate ratios for the longitudinal association between diagnosis and hospital length of stay, 1979–2008

	IRR	99 % CI
Survey year	0.77	0.75–0.78
COD (=1) versus primary SMI (=0)	0.96	0.86–1.06
COD × year interaction	0.95	0.91–0.99

Analysis adjusted for demographic, access to care, and hospital covariates

1979 to 3.2 % ($n = 40{,}216$) in 2008 among those with SMI and 9.3 % ($n = 2{,}169$) in 1979 to 4.6 % ($n = 16{,}056$) in 2008 among those with COD. This type of discharge disposition for patients with other diagnoses remained relatively stable over time.

Adjusted Trends in Hospital Length of Stay and Discharge Status

Table 2 reports the Poisson regression results for hospital length of stay. The table presents expected incidence rate ratios for the main effects of survey year and diagnosis and the interaction between these main effects, adjusted for demographic, access to care, and hospital characteristics. The interaction effect suggests a significant change over time in hospital length of stay between COD and SMI patients. Specifically, patients with COD were associated with a decreased length of time spent in the hospital between 1979 and 2008 (IRR 0.95, 99 % CI 0.91–0.99).

Table 3 reports the logistic regression results for the discharge disposition groups, including routine/home discharges, transferred to facility discharges, and leave without medical advice discharges, after controlling for the same covariates. The table presents the odds ratios for the main effects of survey year and diagnosis and the interactions between these main effects, adjusted for demographic, access to care, and hospital factors. Significant interaction effects were found between diagnosis and time in relation to routine/home discharges and being transferred to facility discharges. Specifically, COD discharges were associated with an increased likelihood of being routinely discharged or discharged home over time (OR 1.27, 99 % CI 1.16–1.40). In contrast, COD discharges were associated with a reduced likelihood of being transferred to a long- or short-term facility over the study period (OR 0.72, 99 % CI 0.65–0.81). The interaction between diagnosis and time in relation to patients who left the hospital against medical advice was not significant at the 0.01 level. However, without the interaction, we found a significant main effect for COD discharges, suggesting that patients with a COD diagnosis are associated with an increased likelihood of leaving the hospital against medical advice averaged across the study period (OR 1.75, 99 % CI 1.51–1.97).

Discussion

Our analysis revealed that rates of SMI and COD hospital discharges almost doubled between 1979 and 2008. Although prevalence estimates in the general population have remained relatively stable during this time (Glied and Frank 2009; Santora and Hutton 2008), our results align with prior research that suggests an increase in treated

Table 3 Adjusted odds ratios for the longitudinal association between diagnosis and hospital discharge status groups, 1979–2008

	Routine/home discharge		Transferred to facility		Leave without medical advice	
	OR	99 % CI	OR	99 % CI	OR	99 % CI
Survey year	1.06	1.03–1.10	0.98	0.95–1.02	0.75	0.70–0.81
COD (=1) versus primary SMI (=0)	0.69	0.55–0.87	1.38	1.06–1.79	1.75	1.51–1.97
COD × year interaction	1.27	1.16–1.40	0.72	1.13–1.27	n/a	n/a

Analyses adjusted for demographic, access to care, and hospital covariates

prevalence of mental illness and co-occurring disorders—in which a diagnosis was recorded during a visit to a health provider—in the general population reported between 1996 and 2006 (Glied and Frank 2009). An increase in treated prevalence, however, does not equate to better quality of care. Despite significant progress in access to mental health treatment for individuals with SMI and CODs, the majority of persons who are in need of treatment receive inadequate treatment (Mojtabai et al. 2009). This represents a treatment gap in community mental health care that may, in part, account for the growth we see in hospitalizations. The increase in general hospital discharges may also reflect the continued downsize of resident populations in public, long-term psychiatric hospitals. The patients who would have received treatment in public psychiatric hospitals are increasingly receiving care in general hospitals (Mechanic et al. 1998).

Although hospital discharge rates for SMI and CODs increased between 1979 and 2008, our findings suggest a decline in the length of stay for both SMI and COD groups over time. These findings are consistent with a recent systematic review of studies examining length of stay in psychiatric hospitals, suggesting that length of stay has decreased and admissions have increased in the past 20 years (Parsons 2006). Parsons (2006) suggests that this trend is likely to continue given research that suggests longer hospital stays may not provide substantial benefit over shorter hospitalizations. In fact, short hospitalizations may be effective when successful linkages are made to outpatient treatment (Schneider and Ross 1996). In light of this evidence, third-payers may not be inclined to pay for unneeded treatment (Parsons 2006). Future studies are needed to shed light on whether shorter hospitalizations lead to beneficial or adverse outcomes.

While our findings provide additional evidence that patients with CODs have shorter hospital stays than those with SMI (Hunt et al. 2002; Ries et al. 2000), they are in contrast to recent research that suggests patients with CODs are associated with a longer hospital stay (Ding et al. 2011). These contradictory findings may be explained by important differences in the samples. Schizophrenia and other psychotic disorders comprised almost 50 percent of patients with CODs in the current study, whereas these disorders comprised only 10 percent of patients with CODs in the study reported by Ding et al. (2011).

One possible explanation for shorter hospital stays among patients with CODs is that co-occurring substance abuse may temporarily exacerbate psychiatric symptoms (Blow et al. 1998; Ries et al. 2000). Once hospitalized, such elevated symptoms might stabilize more quickly after the elimination of abused substances. Our results further show that patients with CODs were more likely to be discharged routinely or to home and less likely to be discharged to short- or long-term facilities compared to those with SMI. Once hospitalized, patients with CODs may not have the severe psychiatric symptoms warranted for discharge placements in facilities, such as nursing homes or assisted living programs (Parsons 2006). Since patients with SMI only were more likely to be transferred to a short- or long-term facility, it could be that these patients are staying in the hospital for longer periods of time while they wait for a placement to become available at a short- or long-term facility. The explanation that persons with CODs are less severe psychiatrically, however, is contradictory to prior research suggesting that this population has greater adverse outcomes than those with a single diagnosis (Drake 2007; Dixon 1999). Unfortunately, we could not assess symptom severity or differentiate between those with substance-heightened psychotic symptoms and those with pure SMI, an area for future study.

These results could also be explained if patients with CODs have a more unpredictable course of illness, marked with frequent and recurrent but shorter hospital stays. Indeed, our results show a greater percentage of patients with CODs who left against medical advice, a discharge disposition that has been described as an indicator of treatment nonadherence (Sharf et al. 2005). Hunt et al. (2002) found shorter lengths of stay among their nonadherent group of patients dually diagnosed with schizophrenia and substance abuse, which they suggest might be due to the large number of patients who left against medical advice. More recently, Tawk et al. (2013) found that substance abuse increased the risk of patients with mental illness leaving the hospital against medical advice. Any conclusions made about patients who leave against medical advice are likely complicated and influenced by multiple clinical, sociodemographic, family and hospital factors.

This study has important limitations. First, discharges involving alcohol and drug abuse/dependence are likely to be underreported for a number of reasons. Physicians may hesitate to record this information given the stigma attached to substance abuse. In addition, if patients' insurance plans do not cover substance abuse treatment, they may receive other diagnoses that are covered by insurance. Another reason for underreporting may be that physicians lack adequate training in screening for co-occurring substance use disorders. Second, the unit of analysis for the NHDS data is the hospital discharge, not an individual, which means that we cannot track individuals who are admitted to the hospital multiple times. Third, limited data were available on discharge dispositions. For example, it would be useful to track if and where referrals were made for aftercare services. Fourth, the accuracy of data is unknown given that diagnoses were made by multiple medical providers and hospital data were entered by

multiple staff members. Although patients were given a particular diagnosis, we do not know if the patient received psychiatric or substance abuse treatment while hospitalized. Finally, the analysis did not account for variations in diagnostic criteria and practices over time.

Despite these limitations, the NHDS is a useful source of treatment data from a nationally representative sample that can be used to monitor trends in hospitalizations over time. The current study is one of few that have compared hospital length of stay and discharge dispositions between patients with SMI and COD across almost three decades. Findings from this study may be useful to hospital providers and administrators in planning inpatient services. Screening and identification of mental health and substance abuse disorders and associated risk factors are critical for planning and referrals to aftercare services. Identification and targeting of patients with co-occurring disorders who are vulnerable to leaving prematurely against medical advice could facilitate treatment planning and efforts to prevent these types of discharges.

With the rise of managed care, there has been a decrease in length of stay and an increase in hospital admissions during the last three decades. What is unclear is whether shorter hospital stays lead to readmissions, or if it is a new pattern of treatment with acute but brief hospitalizations replacing fewer longer stay hospitalizations (Parsons 2006). Further research is needed to examine and explain the association between other factors (e.g., gender, race/ethnicity, diagnosis, medical comorbidity) and hospital length of stay and discharge dispositions among patients with CODs. Prospective studies that include multiple perspectives from patients, families, and hospital staff are needed to better understand the hospital discharge planning process, including how discharge plans are developed and reasons why patients leave against medical advice. Studies that examine the impact of hospital length of stay and dispositions on post-discharge outcomes among patients with and without CODs are also important for a more complete understanding of the clinical implications.

Conflict of interest Dr. Manuel, Ms. Gandy, and Mr. Rieker report no competing interests.

References

Abram, K. M., & Teplin, L. A. (1991). Co-occurring disorders among mentally ill jail detainees. Implications for public policy. *American Psychologist, 46*(10), 1036–1045.

Blow, F. C., Barry, K. L., BootsMiller, B. J., Copeland, L. A., McCormick, R., & Visnic, S. (1998). Longitudinal assessment of inpatient use and functioning of seriously mentally ill veterans with and without co-occurring substance use disorders. *Journal of Psychiatric Research, 32*(5), 311–319.

Buck, J. A. (2011). The looming expansion and transformation of public substance abuse treatment under the Affordable Care Act. *Health Affairs, 30*(8), 1402–1410. doi:10.1377/hlthaff.2011.0480.

Caton, C. L., Shrout, P. E., Eagle, P. F., Opler, L. A., Felix, A., & Dominguez, B. (1994). Risk factors for homelessness among schizophrenic men: A case–control study. *American Journal of Public Health, 84*(2), 265–270.

Chouljian, M., Shumway, E., Balancio, E. V., Dwyer, E. V., Surber, R., & Jacobs, M. (1995). Substance use among schizophrenic outpatients: Prevalence, course, and relation to functional status. *Annals of Clinical Psychiatry, 7*, 19–24.

Croft, B., & Parish, S. L. (2013). Care integration in the Patient Protection and Affordable Care Act: Implications for behavioral health. *Administration and Policy in Mental Health, 40*(4), 258–263. doi:10.1007/s10488-012-0405-0.

Cuffel, B. J. (1996). Comorbid substance use disorder: Prevalence, patterns of use, and course. *New Directions for Mental Health Services, 1996*(70), 93–105. doi:10.1002/yd.23319960209.

Ding, K., Yang, J., Cheng, G., Schiltz, T., Summers, K. M., & Skinstad, A. H. (2011). Hospitalizations and hospital charges for co-occurring substance use and mental disorders. *Journal of Substance Abuse Treatment, 40*(4), 366–375. doi:10.1016/j.jsat.2010.12.005.

Dixon, L. (1999). Dual diagnosis of substance abuse in schizophrenia: Prevalence and impact on outcomes. *Schizophrenia Research, 35*, S93–S100.

Drake, R. E. (2007). Dual diagnosis. *Psychiatry, 6*, 381–384.

Epstein, J., Barker, P., Vorburger, M., & Murtha, C. (2004). *Serious mental illness and its co-occurrence with substance use disorders, 2002 SAMHSA analytic series: A-24*. Research Triangle Park, NC: Research Triangle Institute.

Gfroerer, J. C., Adams, E. H., & Moien, M. (1988). Drug abuse discharges from non-federal short-stay hospitals. *American Journal of Public Health, 78*(12), 1559–1562.

Glied, S. A., & Frank, R. G. (2009). Better but not best: Recent trends in the well-being of the mentally ill. *Health Affairs (Millwood), 28*(3), 637–648. doi:10.1377/hlthaff.28.3.637.

Goodman, L. A., Dutton, M. A., & Harris, M. (1997). The relationship between violence dimensions and symptom severity among homeless, mentally ill women. *Journal of Traumatic Stress, 10*(1), 51–70.

Graham, H. L., Maslin, J., Copello, A., Birchwood, M., Mueser, K., McGovern, D., et al. (2001). Drug and alcohol problems amongst individuals with severe mental health problems in an inner city area of the UK. *Social Psychiatry and Psychiatric Epidemiology, 36*(9), 448–455.

Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Dufour, M. C., Compton, W., et al. (2004). Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry, 61*(8), 807–816. doi:10.1001/archpsyc.61.8.807.

Harris, K. M., & Edlund, M. J. (2005). Use of mental health care and substance abuse treatment among adults with co-occurring disorders. *Psychiatric Services, 56*(8), 954–959. doi:10.1176/appi.ps.56.8.954.

Havassy, B. E., Alvidrez, J., & Mericle, A. A. (2009). Disparities in use of mental health and substance abuse services by persons with co-occurring disorders. *Psychiatric Services, 60*(2), 217–223. doi:10.1176/appi.ps.60.2.217.

Horvitz-Lennon, M., Kilbourne, A. M., & Pincus, H. A. (2006). From silos to bridges: Meeting the general health care needs of adults with severe mental illnesses. *Health Affairs, 25*(3), 659–669. doi:10.1377/hlthaff.25.3.659.

Hunt, G. E., Bergen, J., & Bashir, M. (2002). Medication compliance and comorbid substance abuse in schizophrenia: impact on community survival 4 years after a relapse. *Schizophrenia Research, 54*(3), 253–264.

Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., … Kendler, K. S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Archives of General Psychiatry, 51*(1), 8–19.

Kessler, R. C., Nelson, C. B., McGonagle, K. A., Edlund, M. J., Frank, R. G., & Leaf, P. J. (1996). The epidemiology of co-occurring addictive and mental disorders: Implications for prevention and service utilization. *The American Journal of Orthopsychiatry, 66*(1), 17–31. doi:10.1037/h0080151.

Lambert, M., Conus, P., Lubman, D. I., Wade, D., Yuen, H., Moritz, S., et al. (2005). The impact of substance use disorders on clinical outcome in 643 patients with first-episode psychosis. *Acta Psychiatric Scandinavica, 112*(2), 141–148. doi:10.1111/j.16000447.2005.00554.x.

Margolese, H. C., Negrete, J. C., Tempier, R., & Gill, K. (2006). A 12-month prospective follow-up study of patients with schizophrenia-spectrum disorders and substance abuse: Changes in psychiatric symptoms and substance use. *Schizophrenia Research, 83*, 65–75.

Maynard, C., & Cox, G. B. (1998). Psychiatric hospitalization of persons with dual diagnoses: Estimates from two national surveys. *Psychiatric Services, 49*(12), 1615–1617.

Mechanic, D., McAlpine, D. D., & Olfson, M. (1998). Changing patterns of psychiatric inpatient care in the United States, 1988–1994. *Archives of General Psychiatry, 55*(9), 785–791.

Mojtabai, R., Fochtmann, L., Chang, S. W., Kotov, R., Craig, T. J., & Bromet, E. (2009). Unmet need for mental health care in schizophrenia: An overview of literature and new data from a first-admission study. *Schizophrenia Bulletin, 35*(4), 679–695. doi:10.1093/schbul/sbp045.

Mueser, K. T., Yarnold, P. R., Levinson, D. F., Singh, H., Bellack, A. S., Kee, K., et al. (1990). Prevalence of substance abuse in schizophrenia: Demographic and clinical correlates. *Schizophrenia Bulletin, 16*(1), 31–56.

Narrow, W. E., Regier, D. A., Norquist, G., Rae, D. S., Kennedy, C., & Arons, B. (2000). Mental health service use by Americans with severe mental illnesses. *Social Psychiatry and Psychiatric Epidemiology, 35*(4), 147–155. doi:10.1007/s001270050197.

O'Brien, C. P., Charney, D. S., Lewis, L., Cornish, J. W., Post, R. M., Woody, G. E., et al. (2004). Priority actions to improve the care of persons with co-occurring substance abuse and other mental disorders: A call to action. *Biological Psychiatry, 56*(10), 703–713. doi:10.1016/j.biopsych.2004.10.002.

Parsons, T, I. I. I. (2006). Length of stay: Managed care agenda or a measure of clinical efficacy. *Psychiatry, 3*, 46–52.

Pincus, H. A., Page, A. E., Druss, B., Appelbaum, P. S., Gottlieb, G., & England, M. J. (2007). Can psychiatry cross the quality chasm? Improving the quality of health care for mental and substance use conditions. *The American Journal of Psychiatry, 164*(5), 712–719. doi:10.1176/appi.ajp.164.5.712.

Ries, R. K., Russo, J., Wingerson, D., Snowden, M., Comtois, K. A., Srebnik, D., et al. (2000). Shorter hospital stays and more rapid improvement among patients with schizophrenia and substance disorders. *Psychiatric Services, 51*(2), 210–215.

Rosenberg, S. D., Drake, R. E., Brunette, M. F., Wolford, G. L., & Marsh, B. J. (2005). Hepatitis C virus and HIV co-infection in people with severe mental illness and substance use disorders. *AIDS, 19*(Suppl 3), S26–S33.

SAMHSA. (2006). *2005 National Survey on Drug Use and Health*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies.

Santora, P. B., & Hutton, H. E. (2008). Longitudinal trends in hospital admissions with co-occurring alcohol/drug diagnoses, 1994–2002. *Journal of Substance Abuse Treatment, 35*(1), 1–12. doi:10.1016/j.jsat.2007.08.002.

Schneider, S. E., & Ross, I. M. (1996). Ultra-short hospitalizations for severely mentally ill patients. *Psychiatric Services, 47*, 137–138.

Sharf, B. F., Stelljes, L. A., & Gordon, H. S. (2005). 'A little bitty spot and I'm a big man': Patients' perspectives on refusing diagnosis or treatment for lung cancer. *Psycho-oncology, 14*, 636–646.

Swofford, C. D., Kasckow, J. W., Scheller-Gilkey, G., & Inderbitzin, L. B. (1996). Substance use: A powerful predictor of relapse in schizophrenia. *Schizophrenia Research, 20*(1–2), 145–151.

Tawk, R., Freels, S., & Mullner, R. (2013). Associations of mental, and medical illnesses with against medical advice discharges: The national hospital discharge survey, 1988–2006. *Administration and Policy in Mental Health and Mental Health Services Research, 40*, 124–132.

Watanabe-Galloway, S., & Zhang, W. (2007). Analysis of U.S. trends in discharges from general hospitals for episodes of serious mental illness, 1995–2002. *Psychiatric Services, 58*(4), 496–502. doi:10.1176/appi.ps.58.4.496.

Weber, N. S., Cowan, D. N., Millikan, A. M., & Niebuhr, D. W. (2009). Psychiatric and general medical conditions comorbid with schizophrenia in the National Hospital Discharge Survey. *Psychiatric Services, 60*(8), 1059–1067. doi:10.1176/appi.ps.60.8.1059.