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Patient Factors Associated with Extended Length of Stay in the Psychiatric Inpatient Units of a Large Urban County Hospital

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Abstract

This case-control study identified patient-specific factors associated with the longest psychiatric inpatient lengths of stay (LOS) at a large urban county hospital. Subjects with LOS ≥ 60 days comprised the extended LOS (ELOS) case cohort. An equally-sized control cohort consisted of a random sample of inpatients with LOS ≤ 30 days. T-tests and chi-square tests were conducted to determine differences between groups. Factors associated with ELOS included older age, cognitive impairment, higher number of medical conditions requiring medication, and violence during hospital stay. Initiatives focused on community placement of patients with these characteristics may reduce prolonged LOS at safety-net hospitals.

Introduction

Despite years of attempts to reduce cost, inpatient psychiatric services still account for 16% of all US mental health spending (Frank, Goldman, & McGuire, 2009). Additionally, although inpatient length of stay (LOS) for mental disorders has decreased over the past 30 years, it is still significantly longer than that for physical disorders (Mechanic, McAlpine, & Olfson, 1998; National Center for Health Statistics, 2012).

Much of this burden falls on the safety-net hospitals that provide care to people with severe mental illness in the public sector (Olfson & Mechanic, 1996). A patient may be clinically ready for discharge to a lower level of care based on Medicaid standards, but discharge may be delayed due to waitlists for appropriate facilities. Depending on discharge location, days spent waiting for discharge are termed administrative days or non-acute days, with lower or no reimbursement, respectively, by Medicaid. For example, at the hospital where this study was performed, the 2012–2013 Medicaid reimbursement for an acute day was $1255.02, whereas it was only $416.95 for an administrative day (San Francisco County, 2012). Reduction of inpatient LOS may be one mechanism to decrease administrative and non-acute days and thereby improve resource utilization (Thornicroft & Tansella, 2004; Shumway et al., 2012).

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Unfortunately, most of the high quality studies examining factors related to inpatient LOS are more than ten years old, and many are more than twenty years old (Tulloch, Fearon, & David, 2011). Because many findings are dated and reimbursement guidelines have changed, mental health administrators have little up-to-date guidance to understand which factors may impact LOS. This retrospective case-control study attempts to identify patient factors associated with extended length of stay (ELOS). Ideally, this information could be used to preemptively identify patients at high risk for ELOS and provide administrators guidance for development of outpatient programs that can better serve these patients and reduce inpatient LOS.

Methods

This study was conducted at a large urban county safety-net hospital. A database of discharges was reviewed for stays ending between January 1, 2009 and June 30, 2011. In January 2009, one of the acute inpatient units was converted to a subacute unit with lower staffing requirements. Given the significance of this change, the prior time period was not examined in this study. The study population was drawn from patients admitted to general inpatient psychiatry units.

Hospitalizations ≥ 60 days were identified, and the corresponding patients were considered to be members of the extended LOS (ELOS) cohort. For patients with multiple ELOS hospitalizations, the first one chronologically was chosen for analysis. An equal number of hospitalizations with LOS ≤ 30 days were chosen at random, resulting in the comparison control cohort of patients. Any patient who was also in the ELOS cohort was replaced by the next randomly selected patient.

Patient demographic and clinical predictor variables were chosen based on the literature (Tulloch et al., 2011) and the authors' clinical experience (data extraction form available upon request). Chi-square tests and t-tests were conducted to determine differences in dichotomous and continuous factors, respectively, between the ELOS and comparison groups. To account for multiple comparisons in the analyses, Benjamini-Hochberg adjusted p-values were calculated (Benjamini & Hochberg, 1995; McDonald, 2014).

The study was approved by the Committee on Human Research of the University of California, San Francisco. There are no known conflicts of interest. All authors certify responsibility for this manuscript.

Results

There were 4,246 discharges from psychiatry inpatient units from January 1, 2009 through June 30, 2011. Among these discharges, 86 were for hospitalizations with LOS ≥ 60 days, representing 80 unique patients, who comprise the ELOS cohort. There were 80 patients randomly chosen for the comparison control cohort.

In terms of demographic factors, the ELOS cohort was older (51y vs. 44y, $p = 0.03$). There were no statistically significant differences in race, gender, or housing status.

ELOS patients had a greater length of longest previous hospitalization (40 vs. 15 days, p = 0.01). There were no statistically significant differences in number of psychiatric admissions within the 30 days or year prior to hospitalization, or in lifetime admissions. ELOS was associated with presence of cognitive impairment (29% vs. 10%, p = 0.02) and a higher number of medical conditions requiring medication (2.1 vs. 1.3, p = 0.02).

Members of the ELOS cohort were more likely to have had a violent episode during the index hospital stay (11% vs. 1%, p = 0.04), but there were no significant differences between the groups in terms of violence within two weeks of admission (15% vs. 8%, p = 0.26), lifetime violence (48% vs. 29%, p = 0.07) or presence of homicidal ideation (23% vs. 13%, p = 0.22). ELOS was also associated with less suicidal ideation (13% vs. 41%, p = 0.02). Finally, ELOS was associated with a lower Global Assessment of Functioning (GAF) score at discharge (34 vs. 42, p = .009).

There were no differences between the two groups in presence of urinary incontinence, mobility impairment, delusions, hallucinations, history of arson, and registered sex offender status. There were also no differences in discharge diagnosis of psychotic, mood, substance use, anxiety, and personality disorders.

Discussion

ELOS was associated with older age, presence of cognitive impairment, and higher medical comorbidity. The association with cognitive impairment has been previously identified (Kato, Galynker, Miner, & Rosenblum, 1995). Psychiatric inpatient units for older adults may be more effective than general adult units in dealing with cognitive impairment and medical comorbidity. Some of these units accept patients as young as 50 years old, but it should be noted that 22% of the ELOS patients with cognitive impairment in this sample were under age 50 and would be ineligible. Given the dearth of geriatric psychiatrists (Institute of Medicine, 2008) and the limited availability of specialized geriatric psychiatry units nationally, public mental health administrators should consider directing resources towards treating this vulnerable population. For example, our data indicates that geriatric psychiatry expertise may be needed on inpatient psychiatry units. In addition, expertise in management of behavioral sequelae of cognitive impairment is also needed on an outpatient basis to prevent readmission, since patients with dementia living in nursing homes are at higher risk of emergency commitment than those without dementia (Becker, Boaz, DeMuth, & Andel, 2012).

ELOS patients were more likely to have committed violence during the hospital stay. However, this group of patients was not more likely to have been violent previously, either in their lifetimes or within two weeks of admission, nor to have presented with homicidal ideation. In a previous study, length of stay was associated with neither violence within two weeks of admission nor violence in the first three days of hospitalization (Greenfield, McNiel, & Binder, 1989). However, that study did find that, in the subgroup of inpatients with schizophrenia, those who were violent shortly after admission had longer lengths of stay (Greenfield et al., 1989). Reasons for ELOS in violent patients may have to do with either difficulty in stabilization or lack of placement options after discharge.

One unexpected finding was that those in the extended LOS cohort had less suicidal ideation than the comparison group. The system may be well equipped to both stabilize suicidal patients and find appropriate discharge options for them.

This study has some limitations. Given the descriptive nature of the study, a causal relationship between patient-specific variables and ELOS cannot be proven. The chart reviews were done at a single large urban county hospital, so conclusions are most applicable to similar hospitals. Finally, much of the data was gleaned from discharge summaries. It is possible that the discharge summary writers were more likely to mention certain factors if they seemed to have had an impact on length of stay.

This study found that psychiatric patients with ELOS at an urban safety net hospital were more likely to be older, be cognitively impaired, have higher medical comorbidity, and be violent during hospitalization. Mental health administrators should consider developing enhanced inpatient programming addressing these factors. They should also consider advocating for outpatient disposition options that better serve these vulnerable subpopulations.

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Table

Characteristics of patients in extended length of stay (ELOS) and comparison cohorts.

	ELOS (N=80)		Comparison (N=80)		Benjamini-Hochberg
Variable	**N**	**%**	**N**	**%**	**Adjusted P**
Demographic					
Age on discharge (mean±SD years)	51±17		44±15		**0.03**
Race/Ethnicity					0.22
Caucasian	38	48	26	33	
Black	21	26	32	40	
Other	21	26	22	28	
Gender					0.22
Female	30	38	32	40	
Male	50	63	44	55	
Transgender	0	0	4	5	
Presence of unstable housing in last 30 days[a]	18	23	29	37	0.22
Historical					
Previous admissions within 30 days (Mean±SD)	0.2±0.5		0.2± 0.5		0.77
Previous admissions within 1 year (Mean±SD)	1.2±1.5		1.2± 1.5		0.95
Previous admissions within lifetime (Mean±SD)	6.4±6.8		6.9±12.9		0.84
Length of longest previous admission (Means±SD days)	40±40		15±19		**0.01**
Presence of violence within 2 weeks of admission[a]	12	15	6	8	0.26
Presence of violence within lifetime	38	48	23	29	0.07
History of arson[a]	1	1	0	0	0.67
Registered sex offender status[a]	2	3	1	1	0.77
From Index and Comparison Hospitalizations					
Admission GAF (Mean±SD)[b]	27± 8		28±7		0.42
Discharge GAF (Mean±SD)[b]	34±10		42±9		**0.009**
Medical conditions requiring medication (Mean±SD)	2.1±2.0		1.3±1.6		**0.02**
Presence of cognitive impairment[a]	23	29	8	10	**0.02**
Presence of urinary incontinence[a]	7	9	1	1	0.09

Variable	ELOS (N=80)		Comparison (N=80)		Benjamini-Hochberg
	N	%	N	%	Adjusted P
Presence of mobility impairment[a]	2	3	0	0	0.39
Presence of delusions[a]	37	47	39	49	0.95
Presence of hallucinations[a]	21	27	19	24	0.84
Presence of suicidal ideation[a]	10	13	33	41	**0.02**
Presence of homicidal ideation[a]	18	23	10	13	0.22
Presence of violence during hospital stay[a]	9	11	1	1	**0.04**
Discharge diagnosis of psychotic disorder[a]	59	75	49	61	0.23
Discharge diagnosis of mood disorder[a]	28	35	37	46	0.33
Discharge diagnosis of substance use disorder[a]	33	42	42	53	0.33
Discharge diagnosis of anxiety disorder[a]	8	10	8	10	>.99
Discharge diagnosis of personality disorder[a]	11	14	17	21	0.42

[a] Each of these variables had missing data for 1 or 2 subjects

[b] Each of these variables had significant missing data (Admission GAF N=74 and N=72; Discharge GAF N=67 and N=74).