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Determinants of Pediatric Psychiatry Length of Stay in 2 Urban Emergency Departments

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Objectives: Pediatric mental illness poses a significant burden with an overall prevalence of approximately 10%. Increasingly, children with mental disorders seek care in the emergency department (ED). However, the ED is not an ideal setting. Pediatric mental health patients receive limited treatment and experience significantly longer length of stay (LOS) than other patients seen in the ED. This study examines patient and hospital factors associated with LOS and prolonged LOS (PLOS).

Methods: This is a retrospective chart review of patients between the ages of 3 and 17 presenting at 2 participating urban EDs with a psychiatric diagnosis from May 2010 to May 2012.

Results: This study includes 939 patients with an average age of 14.1 years and a median LOS of 295 minutes. The diagnosis was the strongest predictor of LOS and PLOS. Patients with a psychotic disorder or suicide attempt or ideation experienced a longer LOS, 35% and 55% increases, respectively, and an increased odds of PLOS (odds ratio, 3.07 and 8.36, respectively). Patient sex, previous history of self-harm, and the daily census were associated with both a longer LOS and PLOS. Ethnicity, site of admission, and year of admission were only associated with LOS.

Conclusions: Diagnosis-specific management factors are the primary determinant of LOS. However, some patient characteristics and hospital operational factors are also associated with LOS.

Organizational reforms and an evaluation of the required human and material resources are necessary to improve access to and availability of pediatric mental health care.

Mental illness poses a significant burden in the pediatric population.^{1,2} About 13% to 20% of children suffer from a mental illness every year with the overall prevalence of approximately 10%.^{3,4} Children commonly suffer from anxiety disorders, depression, and attention-deficit hyperactivity disorder. Increasingly, children with mental disorders are seeking care in the emergency department (ED).⁵ This increase in ED visits is in line with a wider trend of increased ED utilization by all age groups. The prevalence of patient presentations to the ED with psychiatric chief complaints, such as suicidal ideation, depression, anxiety, behavioral issues, homicidal ideation, drug overdose, and suicidal attempts has increased by 40% between 1992 and 2001.⁶ Emergency departments are conveniently located and provide flexible access to care in a timely fashion when compared to primary care. The influx of patients has increased ED overcrowding and boarding of patients (a patient who remains in the ED after the patient has been admitted but not transferred to an inpatient unit),

which affects the quality of care received by all patients in the ED.⁷⁻⁹ Even with optimal patient throughput, the ED is not the ideal setting for the management of psychiatric patients.^{10,11}

In a recent report on pediatric mental health services, emergency physicians acknowledged their

lack of experience when dealing with psychiatric conditions particularly among children.¹² Studies indicate that pediatric patients do not receive optimal care in the ED.¹³ Pediatric patients with a psychiatric illness experience a significantly longer length of stay (LOS) than other patients seen in the ED.¹⁴ One study found that mental health visits to the ED often resulted in triage to urgent evaluation and were twice as likely to stay beyond 4 hours when compared to other types of visits.¹⁵ A recent study shows that those requiring admission are boarded for an average of 18 hours.¹⁶ Patient boarding promotes ED overcrowding and is an inefficient use of limited resources. Patients boarded for psychiatric conditions may not receive optimal treatment.¹⁷ Despite evidence of an increase in pediatric ED visits and longer lengths of stay, patient and hospital determinants of LOS have not been clearly elucidated. The ED attends to a large volume of patients, representing a population diverse in age, race/ ethnicity, socioeconomic state, and insurance status. Moreover, clinical management of pediatric mental health ranges widely from 1 ED to the next.¹⁸

In this study, we seek to determine which patient and hospital characteristics influence LOS and are associated with prolonged LOS (PLOS) for pediatric patients seen at 2 urban EDs in California. We hypothesize that the nature of the diagnosis, workload in the ED, and other hospital characteristics are strong predictors of LOS.

METHODS

This study is a retrospective chart review of pediatric patients presenting at 2 participating EDs with a psychiatric diagnosis in the 2 years from May 2010 through May 2012. We sought to identify factors that influence LOS and PLOS. We obtained approval for this study from the Institutional Review Boards at the University of California, Irvine and Long Beach Memorial Medical Center.

Setting

Patients included in the study were treated at the ED of 2 hospitals in Southern California: the University of California, Irvine Medical Center in Orange County and Long Beach Memorial Medical Center (LBMMC) in Los Angeles County. University of California, Irvine Medical Center is a level I adult and level II pediatric trauma center with 37 beds. It has an annual patient volume of approximately 48,000 patients. The LBMMC is a community hospital and a level II trauma center with a 53-bed ED and a dedicated children's ED. The LBMMC ED has an annual pediatric patient volume of approximately 30,000 patients.

Study Population

We included all patients between the ages of 3 and 17 years, treated during the 2-year study period with a psychiatry-related discharge diagnosis. Eligible patients were identified using International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes for psychiatric illnesses. We categorized mental disorders in 6 groups: mood disorder (ICD 9-CM 296.00 to 296.99, 300.4, 309.00 to 309.89, 311.00); anxiety disorder (ICD 9-CM 300.00 to 300.6, 309.81 except 300.4, 300.12 to 300.15); psychotic Disorders (ICD 9-CM 295.00 to 295.95, 297.3, 298.8 or 298.9); substance-related conditions (ICD 9-CM 291.00 to 292.94, 303.00 to 305.98); suicide attempts or ideation (ICD 9-CM E-codes E950 to E959, V62.84, V62.85); behavioral disorders (ICD 9-CM codes 300.12 to 300.15, 301.00 to 301.9, 312 to 314.9); neurodevelopmental disorders (ICD 9-CM 315.00 – 315.9, 317, 318, 318.1, 318.2, 319, 783.4), and others (ICD 9-CM 300.9, 307.1, 307.5, 307.59, 308.1 to 308.9, V codes V61.1 to V71.1). Patients were excluded if they left the ED without being seen or the psychiatric complaint was not the primary discharge diagnosis as determined by the treating physician. Two members of the study team reviewed patient charts and eligibility was determined by consensus.

Outcome

The outcome of this study was LOS, measured in minutes. We measured LOS as the time of triage, taken from the nursing notes, to discharge time as noted in the physician disposition notes. In this analysis, we modeled LOS as a continuous variable and as a dichotomous variable. We used a log transformation of LOS when modeling it as a continuous variable to achieve data that are approximately normally distributed. When modeling LOS as a dichotomous variable, we identified patients who experienced a PLOS. The primary definition of PLOS in this study was a stay that exceeded the national average for pediatric mental health ED stays, which is 4 hours.¹⁴ As a sensitivity analysis, we redefined PLOS as any LOS that exceeded the median LOS for the hospitals during the study period, which was approximately 5 hours.

Patient and Hospital Characteristics

We included variables in the model that may influence LOS. We extracted the following information from the patient medical records: index admission characteristics (patient age, sex, race, diagnosis, and anticipated payer) and medical history (previous psychiatric history and history of self-harm). We also included contextual information about the admission, which included the site of admission, shift of admission, year of admission, and census (number of patients seen in the ED) on day of admission. Race was categorized as white, Hispanic, African American, Asian/Pacific, multi-racial, and other/unknown. We categorized the diagnosis as a mood disorder, anxiety disorder, psychotic disorder, substance abuse disorder, suicide attempt and ideation, behavioral disorder, neurodevelopmental disorder, and other. Anticipated payer was categorized as private, Medicare, Medi-Cal (Medicaid), and self-pay (uninsured). Shift of admission was determined by the triage time. We categorized shift of admission as follows: early morning (12:00 AM to 5:59 AM), morning (6:00 AM to 11:59 AM), afternoon (12:00 PM to 5:59 PM), and night (6:00 PM to 11:59 PM). This categorization mirrors the emergency medicine physician shifts at the 2 hospitals. The admitting hospital was uniquely identified as A or B. We obtained the daily census for the admitting hospital and assigned them to patients based on the day of admission. The daily census serves as a proxy for the workload in the ED on the day of admission. The census variable was divided into quartiles. All data were captured using REDCap, a proprietary data collection and organization system.¹⁹

Statistical Analysis

We conducted a descriptive analysis of our patient population. We used multivariate regression to identify the determinants of LOS and PLOS in our study population. We built a model in 3 stages starting with the index admission characteristics and added the medical history, and hospital characteristics variables listed above with each subsequent stage. Linear and logistic regression models were used to examine the continuous and dichotomous categorizations of LOS used in this study. We also tested for the presence of an interaction between admitting hospital and each of the following: shift of admission, year of admission, and census, and between census and shift of admission. As a sensitivity analysis, we varied categorical threshold of identifying PLOS to test the robustness of our results.

Regression results are displayed as coefficients or odds ratios with 95% confidence intervals (CI). All analysis was conducted using STATA Version 13 (Stata Corp, College Station, TX).

RESULTS

Our study population consisted of 939 patients admitted to 1 of the 2 hospitals participating in this study between May 2010 and May 2012. Figure 1 shows the exclusion process starting with the number of cases identified according to the case notes. Table 1 shows the characteristics of the study population. The median LOS was 4.9 hours (295 minutes). The average age of patients was 14.1 years, and there were approximately equal proportions of men (49%) and women (51%).

More than half of the patients were white (52%), with over one-third Hispanic in origin (35.7%). African Americans, Asians, and biracial individuals comprised the rest of our identified study population. Fifty-two percent were privately insured, 38% had Medicaid, and 8% self-pay. Just over half of the patients had a previous history of the psychiatric illness but only 19% had a previous history of self-harm. The majority of our patients were admitted either in the afternoon or at night (72.5%). Substance-related disorders were the most common diagnosis, comprising 23.1% of admissions. Mood and anxiety disorders were the next most common diagnoses at 19.4% and 19.6%, respectively. Behavioral disorders comprised 14.7%, suicide attempts and ideation 13%, psychotic disorders (5.8%), neurodevelopmental disorders (1.4%), and others (3.1%).

Table 2 shows the results of the linear regression analysis adjusted for patient and hospital characteristics. Several patient and hospital characteristics were associated with an increase in LOS.

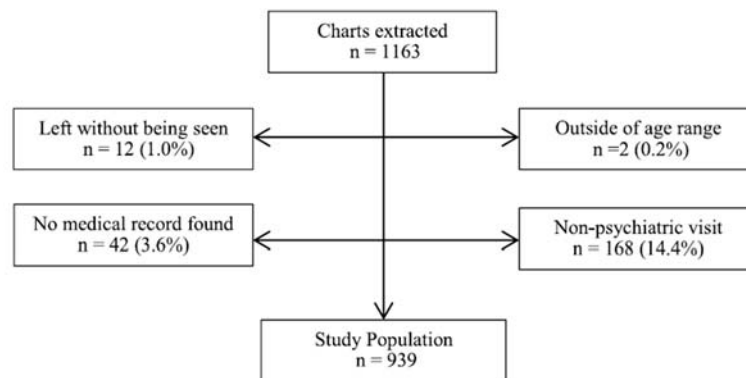


FIGURE 1. Patient inclusion/exclusion flow chart.

TABLE 1. Population Characteristics	
	All (N = 939), n (%)
Length of Stay, median, min	295
Diagnosis	
Mood disorder	182 (19.4)
Anxiety disorder	184 (19.6)
Psychotic disorders	54 (5.8)
Substance-related disorders	217 (23.1)
Suicide attempts and ideation	122 (13.0)
Behavioral disorders	138 (14.7)
Neurodevelopmental disorders	13 (1.4)
Other	29 (3.1)
Age: mean (SD), y	14.1 (2.7)
Sex	
Male	460 (49.0)
Female	479 (51.0)
Race	
White	489 (52.1)
Hispanic	335 (35.7)
African American	30 (3.2)
Asian/Pacific	16 (1.7)
Multiracial	4 (0.4)
Other/unknown	65 (6.9)
Anticipated payer	
Private	486 (51.8)
Medicare	10 (1.1)
Medi-Cal (Medicaid)	356 (37.9)
Self-pay	74 (7.9)
Uninsured	13 (1.4)
Previous Psychiatric history	
No	445 (47.4)
Yes	494 (52.6)
Previous self-harm	
No	765 (81.4)
Yes	174 (18.5)
Presenting shift	
Early morning (12:00 AM to 5:59 AM)	103 (11.0)
Morning (6:00 AM to 11:59 AM)	155 (16.5)
Afternoon (12:00 PM to 5:59 PM)	312 (33.2)
Night (6:00 PM to 11:59 PM)	369 (39.3)
Year of admission	
2010	257 (27.4)
2011	422 (44.9)
2012	260 (27.7)

As noted previously, this analysis used the log-transformed LOS as the outcome measure. Sex, ethnicity, diagnosis, previous history of self-harm, site of admission, daily census, and the year of admission all showed significant associations with LOS. A female patient experienced a 13% (95% CI, 5%–22%) increase in LOS. A previous history of self-harm was associated with a 16% (95% CI, 6%–28%) increase in LOS. Patients admitted on days within the fourth (highest) daily census quartile experienced a 13% (95% CI, 1%–26%) increase in the LOS when compared to the first (lowest) daily census quartile. Admissions during 2012 were associated with a 15% (95% CI, 2%–27%) increase in LOS. Age, insurance, previous history of admission were not significantly associated with LOS. Patients admitted for a suicide attempt or ideation experienced a 55% increase in LOS when compared to those admitted for a substance-related disorder. Psychotic disorders had a 35% increase in LOS, behavioral disorders 25%, and mood disorders 17%. Patients with neurodevelopmental and anxiety disorders had a decreased LOS, 38% and 32%, respectively, compared to those with a substance-related disorder.

Table 3 shows the results of the logistic regression analysis that looked at factors associated with PLOS. In this model, PLOS was based on the national average for pediatric mental health ED visits of 4 hours. The final model containing the characteristics of the index admission, medical history, and admitting hospital characteristics was shown. Diagnosis was the strongest predictor of PLOS. A diagnosis of a suicide attempt or ideation had an 8-fold increase (odds ratio [OR], 8.36; 95% CI, 3.71–18.8) in the odds of PLOS when compared to those with substance-related disorders. Patients with psychotic disorders had a 3-fold increase in the odds of PLOS (OR, 3.06; 95% CI, 1.38–6.80%). Patients admitted for an anxiety disorder had a decrease in the odds of PLOS (OR, 0.35; 95% CI, 0.22–0.53%). Patient and medical history variables associated with PLOS were female sex (OR, 1.49; 95% CI, 1.09–2.03%) and previous history of self-harm (OR, 1.93; 95% CI, 1.21–3.08%). The hospital characteristic associated with PLOS was daily census. The odds ratio for daily census ranged from 1.68 for quartile 2 to 1.65 for quartile 4. Patient age, race, previous history of psychiatric illness, shift of admission, and year of admission were not significantly associated with PLOS.

The sensitivity analysis with PLOS defined using the medical LOS for the admitting hospitals is shown in Table 4. The only significant changes in the predictors compared to the analysis defining PLOS as longer than 4 hours was the absence of a significant association with sex, insurance status, and daily census, and the significant associations with the diagnoses mood disorders and behavioral disorders, and site of admission. The magnitude of the other significant variables identified in the primary analysis (diagnosis, previous history of self-harm, and daily census) were a few percentage points lower, but the point estimates were contained within the original confidence intervals.

DISCUSSION

The strongest predictor of LOS and PLOS was the diagnosis. Patients diagnosed with a psychotic disorder or suicide attempt or ideation were associated with a longer LOS and increased odds of PLOS when compared to those admitted for a substance-use disorder. A diagnosis of a mood disorder or a behavioral disorder was associated with a longer LOS. Neurodevelopmental disorders were associated with a shorter LOS and anxiety disorder with a shorter LOS and decreased odds of PLOS. Patient sex, a previous history of self-harm, and the daily census were associated with both LOS and PLOS. Ethnicity, site of admission, and year of admission were only associated with LOS.

TABLE 2. Association Between Log of Length of Stay and Patient and Hospital Characteristics

Characteristic	Coefficient	95% CI	
		Lower limit	Upper limit
Age, y	-0.01	-0.02	0.10
Sex			
Male	Reference		
Female	0.13*	0.05	0.22
Race			
White	Reference		
Hispanic	-0.11*	-0.22	-0.003
African American	0.04	-0.20	0.27
Asian/Pacific	-0.12	-0.43	0.20
Multiracial	-0.13	-0.75	0.49
Other/unknown	0.01	-0.16	0.17
Insurance			
Private	Reference		
Medicare	0.05	-0.35	0.44
Medi-Cal (Medicaid)	-0.002	-0.09	0.09
Self-pay	-0.03	-0.19	0.13
Uninsured	-0.11	-0.46	0.23
Diagnosis			
Mood disorder	0.17*	0.03	0.31
Anxiety disorder	-0.32*	-0.44	-0.19
Psychotic disorders	0.35*	0.15	0.54
Substance-related disorders	Reference		
Suicide attempts and ideation	0.55*	0.40	0.70
Behavioral disorders	0.25*	0.09	0.40
Neurodevelopmental disorders	-0.38*	-0.75	-0.02
Other	0.22	-0.02	0.47
Previous psychiatric history			
No	Reference		
Yes	-0.07	-0.16	0.02
Previous history of self-harm			
No	Reference		
Yes	0.16*	0.06	0.28
Site			
A	Reference		
B	0.17*	0.06	0.29
Shift of admission			
Early morning (12:00 AM to 5:59 AM)	Reference		
Morning (6:00 AM to 11:59 AM)	-0.08	-0.24	0.07
Afternoon (12:00 PM to 5:59 PM)	-0.03	-0.18	0.11
Night (6:00 PM to 11:59 PM)	-0.05	-0.19	0.08
Year of admission			
2010	Reference		
2011	0.10	-0.001	0.20
2012	0.15	0.02	0.27
Census			
Quartile 1	Reference		
Quartile 2	0.10	-0.02	0.21
Quartile 3	0.09	-0.03	0.20
Quartile 4	0.13	0.01	0.26

*P value < 0.05.

TABLE 3. Association Between Prolonged Length of Stay (Pediatric Average) and Patient and Hospital Characteristics*

Characteristics	OR (95% CI)
Age, y	0.98 (0.93–1.04)
Sex	
Male	Reference
Female	1.49 (1.09–2.03) [†]
Race	
White	Reference
Hispanic	0.75 (0.49–1.14)
African American	0.89 (0.35–2.28)
Asian/Pacific	0.62 (0.21–1.79)
Multiracial	0.74 (0.07–7.71)
Other/unknown	1.31 (0.70–2.45)
Insurance	
Private	Reference
Medicare	1.60 (0.34–7.54)
Medi-Cal (Medicaid)	0.85 (0.61–1.18)
Self-pay	0.75 (0.43–1.30)
Uninsured	0.23 (0.06–0.85) [†]
Diagnosis	
Mood disorder	1.46 (0.88–2.42)
Anxiety disorder	0.35 (0.22–0.53) [†]
Psychotic disorders	3.07 (1.38–6.80) [†]
Substance-related disorders	Reference
Suicide attempts and ideation	8.36 (3.71–18.8) [†]
Behavioral disorders	1.50 (0.86–2.62)
Neurodevelopmental disorders	0.41 (0.12–1.45)
Other	2.55 (0.96–6.81)
Previous psychiatric history	
No	Reference
Yes	0.81 (0.57–1.15)
Previous history of self-harm	
No	Reference
Yes	1.93 (1.21–3.08) [†]
Site	
A	Reference
B	1.34 (0.87–2.07)
Shift of admission	
Early morning (12:00 AM to 5:59 AM)	Reference
Morning (6:00 AM to 11:59 AM)	0.94 (0.53–1.47)
Afternoon (12:00 PM to 5:59 PM)	1.19 (0.70–2.01)
Night (6:00 PM to 11:59 PM)	0.89 (0.53–1.47)
Year of admission	
2010	Reference
2011	1.15 (0.80–1.66)
2012	1.37 (0.87–2.16)
Census	
Quartile 1	Reference
Quartile 2	1.68 (1.11–2.56)*
Quartile 3	1.61 (1.06–2.45)*
Quartile 4	1.65 (1.04–2.62)*

*Prolonged length of stay (pediatric average) defines prolonged length of stay as a length of stay of over 4 hours.
[†]P value <0.05

TABLE 4. Association Between Prolonged Length of Stay (Hospital Median) and Patient and Hospital Characteristics*

Characteristic	OR (95% CI)
Age, y	1.00 (0.94–1.06)
Sex	
Male	Reference
Female	1.27 (0.95–1.71)
Race	
White	Reference
Hispanic	0.71 (0.48–1.06)
African American	1.00 (0.43–2.33)
Asian/Pacific	0.82 (0.29–2.32)
Multiracial	0.51 (0.07–3.95)
Other/unknown	0.91 (0.51–1.62)
Insurance	
Private	Reference
Medicare	0.64 (0.15–2.67)
Medi-Cal (Medicaid)	0.99 (0.72–1.35)
Self-pay	0.68 (0.39–1.20)
Uninsured	0.50 (0.14–1.76)
Diagnosis	
Mood disorder	1.66 (1.03–2.68) [†]
Anxiety disorder	0.42 (0.27–0.66) [†]
Psychotic disorders	3.49 (1.73–7.03) [†]
Substance-related disorders	Reference
Suicide attempts and ideation	5.80 (3.20–10.52) [†]
Behavioral disorders	1.82 (1.07–3.10) [†]
Neurodevelopmental disorders	0.39 (0.10–1.58)
Other	1.56 (0.69–3.53)
Previous psychiatric history	
No	Reference
Yes	0.95 (0.68–1.32)
Previous history of self-harm	
No	Reference
Yes	1.51 (1.01–2.25) [†]
Site	
A	Reference
B	1.58 (1.05–2.38) [†]
Shift of admission	
Early morning (12:00 AM to 5:59 AM)	Reference
Morning (6:00 AM to 11:59 AM)	0.89 (0.51–1.57)
Afternoon (12:00 PM to 5:59 PM)	0.90 (0.54–1.49)
Night (6:00 PM to 11:59 PM)	0.70 (0.43–1.15)
Year of admission	
2010	Reference
2011	1.29 (0.90–1.84)
2012	1.38 (0.89–2.13)
Census	
Quartile 1	Reference
Quartile 2	1.35 (0.90–2.03)
Quartile 3	1.30 (0.87–1.95)
Quartile 4	1.42 (0.91–2.21)

*Prolonged length of stay (hospital median) is defined as a length of stay greater than the median length of stay in each hospital.
[†]P value < 0.05.

The primary driver of the amount of time a child spends in the ED is their diagnosis and medical history. The variation in the management and prognosis of the different conditions plays a significant role. Patients presenting after an attempted suicide, suicidal ideation, or with psychotic behavior may present a significant danger to themselves and or others. This may necessitate the use of an involuntary hold based on California's Lanterman-Petris-Short Act or at the very least a detailed evaluation with an observation period.²⁰ This involuntary hold may explain the increases in LOS and odds of PLOS among these patient groups. Patients with a behavioral disorder or a mood disorder, in the absence of the risk of self-harm, require more complex management than those with a substance-related disorder hence their association with a longer LOS but not PLOS. Anxiety disorders and neurodevelopmental disorders, in the absence of the risk of self-harm have the least complex ED management consisting largely of symptomatic treatment and referral for

outpatient treatment. Thus, these conditions are associated with shorter LOS and decreased odds of PLOS.

A number of other patient and hospital factors were associated with LOS and PLOS. Female sex, insurance status, and the daily hospital census were associated with increase in both LOS and the odds of PLOS. Female patients have longer stays in the hospital when compared to male patients. This indicates a sex disparity that is not explained by differences in diagnosis. Uninsured patients experienced decreased odds of experiencing a PLOS when compared to privately insured patients. This may indicate that they are not receiving the same standard of care as insured patients. Taken together, the association with sex and insurance status may indicate disparities in the care of pediatric psychiatry patients in the ED.

The ED volume is directly related to LOS for adult patients. The impact of patient volume and overcrowding has been noted in other studies and is demonstrated in our analysis. On days with relatively high numbers of patients were seen in the ED, pediatric patients experienced a longer LOS. The slow increase in the LOS is reflected when the year of admission is taken into account, with patients admitted in 2012 experiencing a 15% longer LOS when compared to those admitted in 2010. This increase may not have reached the 4-hour mark used to define PLOS, but may constitute a disturbing trend which should be further examined. This prolongation may be attributed to widespread closures of hospital acute psychiatric units across the state of California. Recently, the California Hospital Association reported, from 1995 to 2011, a decrease of 24% in total psychiatric facilities and a loss of 32% of psychiatric beds.²¹ This dramatic drop in access to psychiatric services was accompanied by a 20% growth in California's population during the same period.

The impact of the absence of outpatient psychiatric facilities is 2-fold. As noted earlier, EDs receive a high volume of pediatric psychiatry patients, further increasing ED overcrowding and reducing quality of care. Few EDs have the appropriate resources to manage these conditions given the limited number of pediatric psychiatrists available in the ED.¹² In addition to the impact on overall ED quality, pediatric psychiatry patients may receive less than optimal care during their admission. A report from the American Academy of Pediatrics suggests that the fast-paced ED does not provide the ideal setting for mental health patients and that ED professionals are inadequately trained and uncomfortable with treating mental illnesses.¹² This report coheres with the observation that 50% of patients who indicate suicidal intent were either not referred for treatment or did not comply with the referral.^{12,22}

Completeness of medical records from which data extraction was performed limits this retrospective study. Disposition time was not accurately charted and as such we could not specifically identify boarding time. However, despite the unavailability of boarding time, our analysis represents the total amount of time patients spent in the ED and identifies a number of associations with patient and hospital characteristics that can be addressed to reduce overcrowding and improve quality of care in the ED.

Emergency departments receive a larger number of pediatric psychiatry patients who undergo less than optimal treatment and increasingly crowd the ED. As more patients gain health insurance under health reform, the number of patients is predicted to rise further. Future research should examine quality improvement in the ED by, for example, equipping EDs with the many necessary resources to address the needs of increasing pediatric psychiatry patients, or exploring alternative staffing models that incorporate pediatric psychiatrists. A mental health workforce needs assessment is required to help identify the burden and assess the current distribution of outpatient services to help improve access to and coordination of pediatric mental health care while reducing any undue burden placed on EDs.

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