Trends in Pediatric Emergency Department Utilization for Mental Health-Related Visits

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Objective To describe trends in utilization of pediatric emergency department (PED) resources by patients with mental health concerns over the past 10 years at a tertiary care hospital.

Study design We conducted a retrospective cohort study of tertiary PED visits from 2003 to 2012. All visits with chief complaint or discharge diagnosis related to mental health were included. Variables analyzed included number and acuity of mental health-related visits, length of stay, waiting time, admission rate, and return visits, relative to all PED visits. Descriptive statistics were used to summarize the results.

Results We observed a 47% increase in the number of mental health presentations compared with a 9% increase in the number of total visits to the PED over the study period. Return visits represented a significant proportion of all mental health-related visits (31%-37% yearly). The proportion of mental health visits triaged to a high acuity level has decreased whereas the proportion of visits triaged to the mid-acuity level has increased. Length of stay for psychiatric patients was significantly longer than for visits to the PED in general. We also observed a 23% increase in the number of mental health-related visits resulting in admission.

Conclusion Mental health-related visits represent a significant and growing burden for the emergency department at a tertiary care PED. These results highlight the need to reassess the allocation of health resources to optimize acute management, risk assessment, and linkage to mental health services upon disposition from the PED. *(J Pediatr 2015;167:905-10)*.

The global picture of mental health is concerning; mental health disorders affect 1 in 4 to 1 in 5 children every year, and the majority of the disease burden in young people is due to mental health-related disorders.[1] Additionally, community mental health resources have become scarce and difficult to access.[1-5] As a consequence, the emergency department (ED) increasingly serves as the "safety net" for children and youth who require psychiatric or psychological management, and cannot access mental health services in a timely manner.[6]

ED utilization among children and youth with mental health concerns in North America is on the rise, contributing to elevated ED and pediatric ED (PED) input and possibly overcrowding. Previous studies demonstrated that length of stay (LOS) for pediatric mental health visits in US EDs are significantly longer than for non-mental health visits, and that the rate of extended LOS for mental health visits is increasing over time.[7-11]

In Canada, there is little published data on PED utilization by patients with mental health presentations. Leon et al enquired about mental health care practices in all 15 Canadian PEDs, finding that a minority of patients use evidence-based guidelines, tools, or policy. Access to PED-based mental health resources was also very varied. Although the majority of patients consult pediatric psychiatry in their PED, only one-third have urgent follow-ups as an adjunct service to ED care. This suggests that aside from imminent threats, PEDs are not yet the ideal setting to manage pediatric mental health presentations.[12]

In another Canadian study, Newton et al reported that pediatric mental health emergencies were increasingly prevalent, associated with a total direct ED cost of 3.5 million Canadian dollars, and resulted in a greater proportion of return visits to the ED, suggesting a need to facilitate access to community-based services.[13] This increase in ED visit volume by patients with mental health complaints, however, was not compared with trends in ED visit volumes overall, nor measures of flow in the EDs through the study period.

Therefore, establishing that mental health-related ED visit volume along with other measures of PED utilization has risen relative to PED visits for other complaints would guide resource allocation and justify important reforms surround-

BCCH	British Columbia Children's Hospital
CTAS	Canadian Triage and Acuity Scale
ED	Emergency department
LOS	Length of stay
PED	Pediatric emergency department
RTED	Returning to the emergency department
WT	Waiting time

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ing the management of these youths in the PED. Thus, we aimed to describe trends in emergency services utilization by children and youths with mental health-related concerns over the decade at a tertiary care PED.

Methods

We conducted a retrospective cohort study of mental health-related visits to the PED at the British Columbia Children's Hospital (BCCH) from 2002 to 2012. The BCCH is a tertiary care referral center and is the only dedicated pediatric hospital in the province. Its PED receives over 40 000 visits a year providing care to children and youths up to 17 years of age, with the exception of certain young adults with ongoing pediatric subspecialty needs. We used administrative data obtained from the Provincial Health Service Authority performance measurement and reporting office. The study was reviewed and approved by our institution's research ethics board.

We included all mental health-related visits to the BCCH PED from January 2002 to December 2012. Mental health-related visits were identified using both chief complaints and discharge diagnoses, which included terms related to mental health disorders such as mood disorder, depression, suicidal ideation, substance abuse, anxiety, behavioral problems, mental observation, psychiatric problems, and their variations. Principal mental health-related diagnoses were then grouped into 8 categories based on a modification of the Diagnostic and Statistical Manual of Mental Disorders, 4th edition classification. Because visits, and not patients, were sampled and used as our unit of analysis, multiple visits by the same patient were included. We excluded visits by patients older than 20 years who initially presented to the BCCH PED but were then redirected or transferred to a community facility or adult ED.

The process of care for mental health-related visits is similar to all other PED visits and remained consistent over the study period. Upon arrival, patients are triaged using the pediatric Canadian Triage and Acuity Scale (CTAS), then are entered the relevant queue for assessment (medical and psycho-social), and management decision by the PED physician, which may include a pediatric psychiatry consultation prior to disposition decision.[14]

Study Objectives and Outcome Measures

Our objective was to describe trends in utilization of PED resources by patients with mental health related disorders over the past 11 years. The system utilization outcome measures included: (1) annual number of mental health-related visits, proportion of mental health visits relative to total ED visits; (2) hospital admission rates, defined as the proportion of mental health-related visits resulting in hospital admission over the total number of mental health-related visits to the ED, (we distinguished admission to a medical vs a psychiatric ward); and (3) proportion of mental health-related visit returning to the ED (RTED) within 30 and 365 days of original visit.

Departmental flow measures included were: (1) level of acuity using the CTAS; (2) LOS defined as time from first ED contact (triage) to time of disposition (discharged home, admitted to hospital, or transferred out); and (3) waiting time (WT) defined as time of first ED contact to the time of first assessment by a physician in the ED. Demographic characteristics included patients' age, sex, and city of residence.

Statistical Analyses

We used descriptive statistics to summarize our results. Continuous variables such as age and time durations (LOS, WT) are presented with means and 95% CI, or as medians and inter-quartiles. Proportions such as rate of admission, acuity level distribution (proportion in each CTAS triage category), and rate of unscheduled return visits are presented with percentages and 95% CI.

Significance and correlation testing was conducted in Microsoft Excel 2010 with the "=CORREL" function, as well as the "Regression" Data Analysis Toolpak for checking (Microsoft, Redmond, Washington). P value and t test were conducted on each measured correlation and comparison, both using the "=T.DIST.2T" function as well as the corresponding Data Analysis Toolpak.

Results

Between January 2002 and December 2012, a total of 8183 mental health-related visits to the BCCH PED were recorded. This represents 1.9% of the 431 797 total PED visits (**Figure 1**). The mean age at presentation was 13.2 [95% CI: 13.1, 13.3] years and was consistent through the study period. Females accounted for 52.7% [95% CI: 50.8, 54.6] of all mental health visits, on average from year to year, and there was a nonsignificant trend of increase over time ($r = 0.531$, $P = .093$). On average, one-half of all mental health visits presented between 4:00 p.m. and midnight, 36% presented between 8:00 a.m. and 4:00 p.m., and 14% presented overnight.

The annual number of mental health visits increased over the study period (529 visits in 2002; 983 in 2012), as shown in **Figure 1**. This represents an 85.8% increase in the number of mental health visits compared with a 27.5% increase number of non-mental health visits (33 915 in 2002; 42 575 in 2012), and both increases were significantly correlated over time (mental health $r = 0.888$, $P < .001$; non-mental health $r = 0.978$, $P < .001$). The proportion of mental health visits to the total number of ED visits increased as well (1.56% in 2002; 2.26% in 2012), and again this represented a significant temporal correlation ($r = 0.733$, $P = .0102$).

Repeat visits represented on average 32.3% (95% CI: 29.3, 35.2) of yearly mental health visits, and the increase from year to year was significant over time ($r = 0.798$, $P = .0035$). Of those repeat visits, approximately 12% occurred within 30 days of the index visit.