BRIEF COMMUNICATION

Clinical Acuity of Repeat Pediatric Mental Health Presentations to the Emergency Department

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Abstract

Objective: We examined whether clinical acuity changed in children and youth with repeated emergency department (ED) visits for mental illness. A secondary, exploratory objective was to examine characteristics associated with clinical acuity. **Method:** We conducted a four-year historical cohort study reviewing data from 1,033 ED presentations by 474 patients (≤17 years) for mood disorders, neurotic/stress-related disorders, and psychosis-related illnesses. We used a multivariable generalized linear mixed model to examine the relationship between clinical acuity (defined by triage level at presentation) and length of time since initial ED visit. Interactions between diagnosis group and age group, sex, and visiting timing were also examined. Explanatory variables (patient demography, diagnosis, disposition, institutional classification and location) were entered into the model to explore their relationship to clinical acuity. **Results:** Clinical acuity did not change between ED visits for children with mood disorders, neurotic/stress-related disorders, or psychosis-related illnesses. The median time to ED return was 7 days. Several characteristics were associated with a higher likelihood of increased clinical acuity at presentation: being male, presenting to the ED with a mood disorder, and attendance to an urban-based ED. **Conclusions:** Repeat ED visits for several pediatric mental illnesses were not a result of destabilized conditions. Further investigation of the relationship between patient characteristics, available community services, and patterned mental health care use is needed to clarify ED utilization patterns.

Key words: *emergency service, repeat visits, pediatrics, illness severity, psychiatry*

Résumé

Objectif: Vérifier si les symptômes cliniques s'aggravent lorsque des enfants et des adolescents se présentent à plusieurs reprises à une Urgence psychiatrique; évaluer la gravité de ces symptômes. **Méthodologie:** Étude, pendant quatre ans, des données tirées de 1 033 visites effectuées par 474 patients (≤17 ans) qui se sont rendus à une Urgence pour troubles de l'humeur, névrose, stress ou maladie à comorbidité psychotique. Les auteurs ont étudié la relation entre la gravité des symptômes cliniques (définie par l'équipe chargée du triage à l'arrivée à l'Urgence) et le temps écoulé depuis la dernière visite à l'Urgence au moyen d'un modèle linéaire généralisé mixte multivariable. Ils ont analysé les interactions entre le diagnostic, l'âge, le sexe des patients et l'heure de la visite. Ils ont introduit certaines variables explicatives (données démographiques, âge du patient, disposition, type et emplacement de l'établissement de santé) dans le modèle afin d'étudier la relation entre ces facteurs et la gravité des symptômes cliniques. **Résultats:** Les symptômes cliniques ne s'aggravent pas lorsque les enfants se rendent à l'Urgence pour troubles de l'humeur, névrose, stress ou psychose. L'intervalle médian entre les visites était de sept jours. Les symptômes risquent de s'aggraver lorsque les patients sont de sexe masculin, qu'ils présentent un trouble de l'humeur et que l'établissement de santé se trouve en ville. **Conclusions:** Les visites répétées à l'Urgence ne sont pas dues à une détérioration de l'état des patients. Il convient d'approfondir l'étude de la relation entre les caractéristiques des patients, les services disponibles dans la communauté et le type de soins offerts en santé mentale afin de clarifier les schémas d'utilisation des urgences.

Mots clés: *urgence, visites répétées, pédiatrie, gravité de la maladie, psychiatrie*

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Introduction

Recognized in Canada as one of three national health care priorities (Leitch, 2007), pediatric mental health care has been chronically under-funded and under-developed. It is now a health system with significant deficits including workforce concerns and geographical barriers to care (Leitch, 2007; Breton, Plante, & St-Georges, 2005; Thomas & Holzer, 2006; Kirby & Keon, 2004; Boydell et al., 2006; Diaz-Granados, Georgiades, & Boyle, 2010), as well as fragmentation of and long wait times for existing services (Kirby & Keon, 2004; Reid & Brown, 2008). In both Canada and the United States, visits to the emergency department (ED) for pediatric mental health crises has increased (Grupp-Phelan et al., 2009; Sills & Bland, 2002; Newton et al., 2009) with increases in these visits considered disproportionate to increases in visits for other chronic diseases (Sills & Bland, 2002).

Repeated use of the ED for pediatric mental health care has been associated with community service wait-lists (Parker et al., 2003; Smith & Hadorn, 2002), dissatisfaction with primary care, perceived efficiency, and convenience (Berry, Brousseau, Brotanek, Tomany-Korman, & Flores, 2008). While adult repeat users have been characterized as having chronic health and psychosocial problems (Ledoux & Minner, 2006), pediatric repeat users are less described. Studies have suggested return visits occur within a short time period (Christodulu, Lichenstein, Weist, Shafer, & Simone, 2002; Goldstein, Frosch, Davarya, & Leaf, 2007) particularly for patients with mood, anxiety/stress, and psychosis-related illnesses (Newton et al., 2010) and those already using mental health services (Goldstein et al., 2007). There has been no exploration, however, whether clinical acuity changes over the course of ED visits and if patient and organizational characteristics are associated with clinical acuity. Such an investigation can help determine whether repeat visits result from destabilized conditions (increased acuity over time) or represent patterns of health care use (stable acuity over time) with unique patient and organizational features.

The primary objective of this study was to examine whether clinical acuity changed over repeated visits for children and youth with mood disorders, neurotic/stress-related disorders, and psychosis-related illnesses. Based on deficits observed by others in children's mental health care, we hypothesized that acuity would not change over the course of ED visits by the same patient. A secondary, exploratory objective was to examine characteristics associated with clinical acuity.

Materials and Methods

This historical cohort study used data from four fiscal years (April 2002 to March 2006) obtained from the Ambulatory Care Classification System (ACCS) of Alberta. We abstracted data for ED visits by children and youth (≤17 years) who presented multiple times (>1) to an ED within 90 days for a mood disorder, neurotic/stress-related disorder, or psychosis-related illness (grouped according to World Health Organization clusters; International Statistical Classification of Diseases and Related Health Problems [ICD-10], www.who.int/classification/icd/en/). One of these diagnoses needed to be indicated in the main diagnostic field (primary reason for presentation) of the index visit (first ED visit). We also abstracted patient demographic data (age at each presentation and sex), dates of all ED visits (to track repeat use) and institutional classification (classified as pediatric or general, and rural or urban based institutions) based on Statistics Canada definitions (www.statcan.gc.ca/bsolc/olc-cel/olc-cel?catno=94-581-X2006003&lang=eng). We used a five-level triage score (coded according to the Canadian Emergency Department Triage and Acuity Scale; CTAS) as the best available proxy for estimating condition severity. A CTAS score is assigned to all ED visits to estimate clinical urgency for care and is based on presenting complaint using physiologic and historical modifiers (1–Rescusitation, 2–Emergency, 3–Urgent, 4–Semi-urgent, 5–Non-urgent; Murray, Bullard, & Grafstein for the CTAS and CEDIS National Working Groups, 2004; Warren, Jarvis, LeBlanc, Gravel, & the CTAS National Working Group (NWG)., 2008).

A multivariable generalized linear mixed model for ordinal data (cumulative logit link, patient random effect) was developed to relate acuity to demography and presentation characteristics (SAS GLIMMIX, SAS System Version 9.1 for Windows. SAS Institute Inc., Cary, NC, USA). Due to data sparseness for the resuscitation triage score, we formed an acuity variable for this study: 'highly acute' defined as resuscitation or emergency (triage levels 1 and 2), 'moderately acute' defined as urgent (triage level 3), and 'less acute' defined as semi-urgent or non-urgent (triage levels 4 and 5). All study variables were entered into the model. Additional terms of 'time since initial ED visit' during the study period and interactions between diagnosis group and age group, sex, and time since initial ED visit were also considered for entry, but removed if not statistically significant (p value <0.05). Odds ratios (ORs) with 95% confidence intervals (CIs) are reported. The OR compared whether the probability of a repeat ED visit was the same between a reference and comparison group (OR = 1, the repeat visit was equally likely in both groups; OR > 1, the repeat visit was more likely in the comparison group; OR < 1, the repeat visit was less likely in the comparison group). The University of Alberta Health Research Ethics Board approved this study.

Results

During the study period, 474 children and youth made 1,033 presentations for mood disorders, neurotic/stress-related disorders, or psychosis-related illnesses. Visits were reported by an average of 98 EDs per year. Presentation acuity during the study period for first ED presentation (Table 1) included more 'moderately acute' (221/474; 46.6%) and 'less acute'

Table 1. Baseline demographic characteristics based on acuity levels using CTAS (n=474)

	Highly acute (CTAS 1 and 2) Patients, N (%)	Moderately acute (CTAS 3) Patients, N (%)	Less acute (CTAS 4 and 5) Patients, N (%)	Total
Age group				
0-12 years	3 (5.4)	28 (50.0)	25 (44.6)	56 (11.8)
13-17 years	24 (5.7)	193 (46.2)	201 (48.1)	418 (88.2)
Sex				
Male	9 (5.1)	92 (51.7)	77 (43.2)	178 (37.6)
Female	18 (6.1)	129 (43.6)	149 (50.3)	296 (62.4)
ED Region				
Urban	23 (6.5)	181 (51.4)	148 (42.1)	352 (74.3)
Rural	4 (3.3)	40 (32.8)	78 (63.9)	122 (25.7)
ED Classification				
Pediatric	1 (1.6)	41 (67.2)	19 (31.2)	61 (12.9)
General	26 (6.3)	180 (43.6)	207 (50.1)	413 (87.1)
Diagnosis				
Mood disorder	10 (4.4)	123 (53.9)	95 (41.7)	228 (48.1)
Neurotic/stress-related disorder	14 (6.6)	84 (39.4)	115 (54.0)	213 (44.9)
Schizophrenia/psychosis-related illness	3 (9.1)	14 (42.4)	16 (48.5)	33 (7.0)

(226/474; 47.7%) presentations than 'highly acute' (27/474; 5.7%). The majority of presentations were made to urban EDs and were non-pediatric in classification. Returning patients were typically between the ages of 13 to 17 years (88.2%) and female (62.4%). The median time to return for a second ED mental health visit by 474 children/youth was 7.0 days (IQR: 1.0, 28.0). Less children/youth made a third return visit (n=60), which occurred within a median time of 19.0 days from the initial ED visit, and a fourth visit which was made by 14 children/youth within a median time of 33.5 days since initial presentation (IQR: 12.0, 78.0). The proportion of visits for mood disorders, neurotic/stress-related disorders, and psychosis-related illness remained relatively stable over subsequent visits (Table 2). There was no evidence (p=0.919) that clinical acuity was associated with the length of time since the first visit (i.e., shorter times to return ED visits were not indicative of changes in clinical acuity), and overall patient acuity decreased with subsequent visits (Table 2).

For patient variables (Table 3), the likelihood of male patients presenting to the ED with higher acuity was 1.38 times higher than females (95%CI: 1.05-1.83). Patients with visits for mood disorders were more likely to have higher acuity needs than patients visiting for neurotic/stress-related disorders (OR=1.48; 95%CI: 1.13-1.94); there was weak evidence supporting higher clinical acuity for patients with psychosis-related illnesses (OR=1.56; 95%CI: 0.93-2.59). Rural patients were less likely to present to the ED with more acute conditions than patients in urban areas (OR=0.49; 95%CI: 0.36-0.68). There was no evidence that patients presenting to pediatric *versus* general EDs were more likely to have conditions of higher acuity (p=0.178). Interaction terms (time×diagnosis, diagnosis×age, diagnosis×sex) were not statistically significant.

Discussion

Current research conclusions that repeat pediatric mental health ED visits are associated with wait-lists for community services, dissatisfaction with primary care, perceived efficiency, and convenience suggest that deterioration in mental health status is not necessarily a primary reason for an ED visit. Our study adds to this body of work by demonstrating in a large pediatric sample of children and youth with mood disorders, neurotic/stress-related disorders, and psychosis-related illnesses that their clinical acuity did not change over the course of repeat ED visits. This finding calls to question, the regular role the ED is serving for these children, youth, and their families and whether it is the best health care option for them.

Acute, but stable pediatric mental illnesses may be better served outside of the ED. Wait times for care can be lengthy for non-life threatening conditions in this setting (Newton et al., 2011b) and ED assessments may not necessarily result in recommendations for post-discharge care (Newton et al., 2011a). A recent Canadian study reported that parents seek mental health care for their children in EDs to stabilize acute situations, request guidance for at-home management, and

Table 2. Descriptive measures of time (days) since first ED visit to subsequent visits (n=474)

	Visit 2 (n=474)	Visit 3 (n=60)	Visit 4 (n=14)
Days since Visit 1, Mean (SD)	19.1 (24.9)	30.8 (27.9)	43.1 (33.8)
Median (IQR)	7.0 (1.0,28.0)	19.0 (6.5,49.5)	33.5 (12.0,78.0)
Age group, N (%)			
0-12 years	53 (11.2)	8 (13.3)	1 (7.1)
13-17 years	421 (88.8)	52 (86.7)	13 (92.9)
Sex			
Male	178 (37.6)	23 (38.3)	7 (50.0)
Female	296 (62.4)	37 (61.7)	7 (50.0)
ED Region			
Urban	377 (79.5)	45 (75.0)	8 (57.1)
Rural	97 (20.5)	15 (25.0)	6 (42.9)
ED classification			
Pediatric	57 (12.0)	5 (8.3)	7 (7.1)
General	417 (88.0)	55 (91.7)	13 (92.9)
Diagnosis			
Mood disorder	203 (42.8)	29 (48.3)	5 (35.7)
Neurotic/stress-related disorder	234 (49.4)	24 (40.0)	8 (57.2)
Schizophrenia/psychosis-related illness	37 (7.8)	7 (11.7)	1 (7.1)
Acuity Level			
Highly acute (CTAS 1 and 2)	32 (6.7)	3 (5.0)	0 (0.0)
Moderately acute (CTAS 3)	225 (47.5)	26 (43.3)	5 (35.7)
Less acute (CTAS 4 and 5)	217 (45.8)	31 (51.7)	9 (64.3)

gain access to community resources (Cloutier et al., 2010). It may be that repeated acute situations experienced by families are not the result of increasing clinical acuity, but due to ongoing, stressful management of their child/youth's symptoms, and a desire to access community-based mental health resources that families are not aware of or experience as inaccessible. While the answers to these propositions are outside of the scope of this study, they can help to define how and why emergency services for pediatric mental health conditions are used, and contribute to a critically needed discussion in Canada on what resources are available for children, youth, and their families with acute but stable crises, and whether alternative options to EDs are appropriate, available, and accessible.

While this study's findings point to a pattern of ED use for certain conditions that are not destabilizing, it is still unclear whether these children and youth were waiting for or receiving other community-based services and whether this factored into their emergency care use. For some children, youth, and their families, the ED might have been accessed as an adjunct to existing care (received or to be received) a phenomenon identified by Goldstein et al. (2007). Other reasons that may have also influenced reasons for accessing the ED include child/youth comorbidity, a lack of social supports, hospital proximity, and parent coping. Relying on a provincial dataset, we had access to a limited variable set, however, which reduced our ability to study the relationship between health utilization and clinical, psychosocial and patient factors.

As part of this study, we also identified several characteristics that place patients with mood disorders, neurotic/stress-related disorders, or psychosis-related illnesses at a higher likelihood of increased clinical acuity at initial ED presentation: being male, presenting to the ED with a mood disorder, and attendance to an urban-based ED. This analysis was considered exploratory and as a next step, future prospective studies should define the multi-level relationship between these characteristics, clinical acuity, psychiatric care needs, and ED use. For example, research shows that prior to the onset of psychosis, males are more likely to report substance abuse and lower social/vocational functioning (Cotton et al., 2009; Marvin, Rosen, Reilly, Solari, & Sweeney,

Table 3. Relationship between clinical acuity and explanatory variables

	Estimate (Standard Error)	Odds Ratio‡ (95%CI)	p-value
Age group			
0 -12 years	0.039 (0.220)	1.039 (0.675 – 1.601)	0.860
13-17 years		Reference	
Sex			
Male	0.324 (0.142)	1.382 (1.046 – 1.826)	0.023*
Female		Reference	
ED region			
Rural	-0.715 (0.164)	0.489 (0.355 – 0.675)	0.001*
Urban		Reference	
ED classification			
Pediatric	0.283 (0.210)	1.328 (0.879 – 2.006)	0.178
General		Reference	
Diagnosis			
Psychosis-related illness	0.442 (0.260)	1.556 (0.933 – 2.594)	0.090
Mood disorder	0.391 (0.139)	1.479 (1.126 – 1.942)	0.005*
Neurotic/stress-related disorder		Reference	

* Statistically significant at the 0.05 level.

‡ Calculated from the multivariable generalized linear mixed model and indicates the relative likelihood that a group of patients, as compared to the reference group, have a more acute presentation.

2007). The presence of comorbid conditions and few social supports may contribute to repeat ED visits in that males are more likely to avoid support and their substance abuse may not only compound their mental illness, but further alienate them from social and vocational integration. Such circumstances may also affect how community-based mental health care should be offered for these young men following an ED visit including the need for emergency care professionals to assess social and personal behaviours to decrease the chance of repeated ED use and increase the chance of community-based placement. Similarly, youth with depression are known to perceive barriers to care and stigma (Meredith et al., 2009), can have parents with similar impairments, and have coexisting emotional and behavioural problems (Jaycox et al., 2009). These difficulties may result in delayed health care access (youth or parent delays) leading to the need for urgent care and more acute conditions seen at ED presentation. All of these speculations warrant further investigation to better address the needs of these high-acuity patients. The role of ED location (urban versus rural) is one that has not been examined in the literature, but our findings highlight questions for future studies such as: Do higher acuity patients seek care at urban EDs because of perceptions in resource availability at urban-based locales? Do urban EDs have the necessary resources to adequately treat patients with higher acuity?

This study had several limitations. While our total study sample was large, the sample available for our last time point (a fourth ED visit) was small, limiting broad conclusions for children and youth with more than three ED visits. Given the retrospective study design, we were also unable to verify diagnostic reporting recorded in the ACCS. Although Alberta Health and Wellness (2006) has indicated that the accuracy of the ED main diagnosis is 87%, primary diagnoses in this study may have characterized behaviours (e.g., bizarre behaviours) rather than illnesses (e.g., schizophrenia), and point to important considerations for how mental health presentations are characterized by emergency physicians. Finally, while triage level using the CTAS was the best proxy measure available for assessing clinical acuity, validity and reliability have been examined more extensively in non-psychiatric pediatric populations (Gravel et al., 2007; Bergeron, Gouin, Bailey, Amre, & Patel, 2004). Further validation of the CTAS is needed to ensure acuity is accurately and consistently identified in mental health patients.

Conclusion

In this study, clinical acuity did not change over the course of repeat ED visits by children and youth with mood disorders, neurotic/stress-related disorders, and psychosis-related illnesses. This finding calls to question other reasons that may be influencing the decision to return to the ED for subsequent mental health care, as well as the regular role the ED is serving for these children, youth, and their families and whether it is the best health care option for them. Our study also

identified several characteristics that place these patients at a higher likelihood of increased clinical acuity at presentation: being male, presenting to the ED with a mood disorder, and attendance to an urban-based ED. Further investigation of the multi-level relationship between these characteristics, clinical acuity, psychiatric care needs, and ED use are needed to better explain the trends observed in this study.

Acknowledgments / Conflicts of Interest

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