The Impact of Mental Health Services in a Pediatric Emergency Department

The Implications of Having Trained Psychiatric Professionals

Sharon M. Holder, PhD, MSc, MSW,† Kenneth Rogers, MD, MSPH, MMM,† Eunice Peterson, MD,† Robbie Shoenleben, MA, LPC,‡ and Dawn Blackhurst, DrPH§*

Objectives: This study assessed improvement in the emergency department (ED) length of stay and costs after implementation of an ED program which added board-certified psychiatrists and trained psychiatric social workers to the pediatric ED.

Methods: A retrospective medical record and administrative data review were conducted for all pediatric psychiatric visits of children aged 5 to 18 years who were seen and discharged from the Greenville Memorial Hospital ED between January 1, 2007, and June 31, 2013. These subjects were diagnosed by the ED physician at the time of the visit using codes ranging from 290.0 to 319.0 based on the International Statistical Classification of Diseases and Related Health Problems, Ninth Revision codes.

Results: The mean (SD) age of children in the postprogram period (14.3 ± 3.1) was younger than during the preprogram period (14.9 ± 3.1) ($P < 0.001$) with the greatest increase in the 11- to 15-year age group (42% vs 35%, respectively). Patients in the postprogram period were significantly more likely to be discharged to a psychiatric hospital than during the pre-program period (18% vs 9%, respectively). After the initiation of the program, ED length of stay decreased significantly from 14.7 to 12.1 hours ($P < 0.001$) and costs per visit decreased slightly from US $602 to US $588 (this difference was not statistically significant).

Conclusions: Although this model of care has significant costs associated with it, the efficiency of care for psychiatric pediatric patients in the ED improved after targeted training of ED staff and provision of these specialized services within the ED.

Key Words: length of stay, trained psychiatric professionals

(*Pediatr Emer Care* 2017;33: 311–314)

The US Surgeon General's Report on Mental Health noted that 1 in 5 or 21% of children ages 9 to 17 years have a diagnosable mental health disorder.[1] It has been posited that by 2020 mental illness will be among one of the most common causes of morbidity and mortality among children and adolescents.[2,3] Emergency departments (EDs) are increasingly becoming the initial point of contact and evaluation for pediatric patients with psychiatric conditions. Estimates suggest that children and adolescents with mental health issues accounted for 2% to 5% of pediatric ED (PED) visits,[3,4] ranging from 200,000 to 825,000 visits per year.[5,6] Yet, numerous studies indicate that EDs are ill-equipped and poorly prepared to accommodate this demand.[6,7] The complexity of the situation is due to the scarcity of psychiatric services for inpatient and outpatient mental health patients who need care and the demand of an unfunded mandate to provide care for these patients in EDs.[7–9]

From the *Department of Public Health Sciences and the Institute of Family and Neighborhood Life, Clemson University, Clemson; †Department of Psychiatry & Behavioral Medicine, ‡Clinical Services, Department of Psychiatry, and §Quality Management Department, Greenville Health System, Greenville, SC.

Disclosure: The authors declare no conflict of interest.

Reprints: Sharon M. Holder, PhD, MSc, MSW, Department of Public Health Sciences and the Institute of Family and Neighborhood Life, Clemson University, Clemson, SC (e-mail: sholder2@ghs.org).

ISSN: 0749-5161

Unfortunately, families and children who seek urgent pediatric mental health care through an ED are faced with certain challenges. Most EDs suffer from having few trained pediatric experts, long wait times,[8] overcrowding,[10] and lack of cultural, linguistic, and developmental competence in clinical staff.[1,7] These deficits in the PED infrastructure are often a burden on an overextended and minimally funded mental health system, thus impacting patient outcomes[7] by increasing in-hospital mortality and utilization of resources.[8]

The purpose of this study was to evaluate the potential impact of increasing pediatric mental health expertise in the ED with a particular expectation of decreased length of stay (LOS) and cost per visit. An ED program which increased training of psychiatric social workers and increased time of board certified psychiatrists in the PED was implemented with the goal of improving quality and efficiency of service provision. We asserted that subject expertise can contribute to strengthening the infrastructure of the PED to better address mental illness in children and offer adequate support for caregivers.

METHODS

Study Design and Population

A retrospective medical record and administrative data review based on published methodological guidelines[11,12] was conducted for all pediatric psychiatric visits at the Greenville Memorial Hospital (GMH) ED between January 1, 2007, and June 30, 2013. Children aged 5 to 18 years with a primary diagnosis code for mental illness between 290.0 and 319.0 based on the International Classification of Diseases, Ninth Revision[13] were included in this study. The diagnosis was determined by a Board Certified Child and Adolescent Psychiatrist using the Kiddie-SADS,[14] a semistructured interview. This study was approved by the Greenville Health System Institutional Review Board.

This study utilized existing electronic data on the study population described above. The preprogram period was from January 1, 2007, to June 30, 2010 and included (n = 1237) visits to the PED. The postprogram period from July 1, 2010, to June 30, 2013 included (n = 1983) visits to the PED. The number of patients treated during the preprogram period was 1048 and postprogram period was 1613, respectively.

Setting

The Department of Psychiatry, an embedded component of Greenville Health System, provides a complete spectrum of care to diagnose and treat psychiatric disorders. Under the auspices of the GMH/University Medical Center, the Department of Psychiatry implemented a program in the ED to improve the mental health care services provided to children and adolescents in the PED. Before July 2010, patients treated in the GMH PED had limited access to evaluations by staff with mental health expertise. Most assessments were made by bachelor and master level clinicians, such as nurses

and social workers. The ED social worker was available to see children and adolescents 20 hours daily and a psychiatrist was available for consultation for up to 4 hours daily. An interdepartmental preprogram quality review posited that the lack of specialized training in mental health by the PED staff potentially adversely impacted the provision of comprehensive mental health assessment and appropriate referrals for follow-up care.

With the goal of increasing psychiatric expertise in the PED, 8 social work positions were transferred to the Department of Psychiatry. The assigned social workers participated in supplemental mental health refresher course primarily designed and led by a Board Certified Child and Adolescent Psychiatrist. The curriculum incorporated interactive lectures and case-based learning with a focus on pediatric conditions. Instruction was held in a small group setting Mondays through Fridays for approximately 3 hours per week for a total of 25 hours. After this training, the social workers were paired with a child and adolescent psychiatrist for ongoing training and consultation. This psychiatrist was also available to the PED 8 hours daily, in addition to the 4 hours of psychiatrist consultation that was previously available. Additionally, the social workers received reinforcement and expansion of their training through daily team meetings and case reviews. The task of the child and adolescent psychiatrist was to review PED cases with the social workers daily, provide education and liaison services to the social workers and ED physicians, and clinically evaluate and treat complex cases.

Statistical Analysis and Confidentiality of Data

Descriptive statistics were used for the study variables. Contentious variables, such as age, were reported in mean and SD. Categorical variables were described in frequency and percentages. The following covariates were found to be significant determinants of PED visits: age, 10 years or younger (continuous variables ranging from 10 to 18 years), payor source (Medicaid), and disposition (home) (see Table 1). Clinical characteristics have also been found to be determinants of PED visits. The International Statistical Classification of Diseases and Related Health Problems, Ninth Revision codes for psychiatric diagnoses were coded as a series of dummy variables for substance-related disorders, mood, anxiety, adjustment, psychosis, and mental disorders due to a general medical condition as in previous research.[13] All analyses were performed using SAS Version 9.3 (SAS Institute, Inc., Cary, NC).

RESULTS

The ED at Greenville Memorial Hospital/University Medical Center has approximately 100,000 visits annually, and 5% to 8% of these visits are primarily for mental health/behavioral reasons. During the 3-year time frame for this study there were 1048 preprogram and 1983 postprogram pediatric mental health visits to the PED, respectively (Table 1). The number of visits per patient decreased in the postprogram period.

The mean (SD) age of children in the postprogram period (14.3 ± 3.1) was younger than during the preprogram period (14.9 ± 3.1) ($P < 0.001$) with the greatest increase in the 11- to 15-year age group (42% vs 35%, respectively). Although previous studies show that sociodemographic characteristics, such as sex and racial/ethnic differences often have an influence on PED LOS,[15] in our study, they were not significant determinants of PED visits, as shown in Table 1. However, more children with Medicaid were seen postprogram suggesting that staff members were more likely to identify youth from lower socioeconomic status. Fewer postprogram patients were admitted to pediatric treatment units, but were significantly more likely to be discharged to a psychiatric hospital than during the preprogram period (18% vs 9%, respectively).

TABLE 1. Descriptive Statistics of Patients Characteristics by Period, n (%)

Characteristic	Preprogram	Postprogram	*P*
No. ED visits	1237	1983	—
No. patients	1048	1613	—
Age group: no. (%), y			
≤10	144 (11.6)	277 (14.0)	<0.001*
11–15	438 (35.4)	834 (42.1)	
16–18	655 (53.0)	872 (43.9)	
Mean age ± SD	14.9 ± 3.1	14.3 ± 3.1	<0.001*
Sex: no. (%)			
Male	665 (53.8)	1045 (52.7)	0.557
Female	572 (46.2)	938 (47.3)	
Race/ethnicity: no. (%)			
White	899 (72.7)	1413 (71.3)	0.320
African American	252 (20.4)	420 (21.2)	
Hispanic	52 (4.2)	74 (3.7)	
Other	34 (2.8)	76 (3.8)	
Payor: no. (%)			
Medicaid	642 (51.9)	1114 (56.2)	0.018*
Discharge status: no. (%)			
Home	804 (65.0)	1293 (65.2)	<0.001*
Inpatient pediatric treatment	215 (17.4)	21 (1.1)	
Psychiatric hospitalization	113 (9.1)	351 (17.7)	
Residential treatment center	20 (1.6)	40 (2.0)	
against medical advice	36 (2.9)	37 (1.9)	
Other†	49 (4.0)	241 (12.2)	

Significance levels *P <0.05.

†The "other" discharge status includes outpatient services and or other psychiatric facilities.

Table 2 presents results of program implementation on LOS and cost per PED visit. Length of stay for the visit was defined as the time from triage to the time of discharge from the PED for the designated patient population. After the initiation of the program, PED LOS decreased significantly from 14.7 to 12.1 hours ($P < 0.001$) and costs per visit decreased slightly from US $602 to US $588 (however, this difference was not statistically significant) (Table 2). The US $588 included the additional child and adolescent psychiatrist time that was available in the ED for consultation and evaluation of youth.

DISCUSSION

The cuts in state and federal budgets combined with the shortage of metal health providers in many communities have resulted in EDs becoming the primary treatment locations for many youth in need of behavioral health care. The provision of psychiatric services in the ED has become more complicated as ED staffs are expected to evaluate, provide disposition for, and in many cases, initiate treatment for youth with behavioral health problems. As such, EDs need to be better equipped to provide competent behavioral health care to children in crisis. Trained pediatric mental health clinicians will be needed to provide these services in PEDs. The goal of our study was to assess the potential impact of training staff in the PED by comparing PED LOS and PED visit costs before and after program implementation of board certified psychiatrists and trained psychiatric social workers in the PED.

Each patient in the study received a psychiatric evaluation by a board certified psychiatrist and/or a trained psychiatric social

TABLE 2. ED Length of Stay and Discharge Status Preprogram Versus Postprogram, n (%)

	Preprogram	Postprogram	Postprogram
Length of ED stay, h			
Mean ± SE	14.7 ± 0.7	12.1 ± 0.4	<0.001*
25th, 75th percentiles	3, 19	3, 16	
Total costs for ED visit			
Mean ± SE	US $602 ± 17.3	US $588 ± 6.3	0.451
25th, 75 percentiles	US $307, US $724	US $436, US $735	

Significance levels *P <0.05.

worker. Similar to other studies,[3,5,16] a significant proportion (18%) of patients were more likely to be sent to a psychiatric hospital when evaluated by more skilled personnel. One possible explanation for this finding could be that the increased training allowed for more sensitive assessments and therefore more appropriate disposition recommendations.[3,17] Alternatively, increased hospitalizations could also be due to increased acuity of presenting symptoms.

The relationship between LOS and cost per visit has not been fully examined, but there are several interesting findings from this study. It was notable that our study revealed that a significant decrease in LOS did not translate into a significant decrease in the cost per visit during that same time period. However, it should be noted that the cost did not rise with the addition of a full-time Child and Adolescent Psychiatrist who was able to provide consultation to the PED physicians as well as social workers. It is believed that this increased coordination of care provided better outcomes for these patients but will need to be investigated further in future studies.

Although there were no differences in socio-demographic findings between the preprogram and postprogram time frames, there were differences in the number of youth with Medicaid who were seen and evaluated. There were several explanations posited for these differences. First, youths who were more socioeconomically disadvantaged presented with co-morbid medical problems were more likely to be referred to the behavioral health team because of the availability of services in the PED. Second, there was anecdotal evidence that there were more referrals to the ED from other agencies (schools, social service agencies) and self-referrals because of the increased services in the PED. Third, more Medicaid youth were seen in the PED because they were able to be seen more quickly in the PED than in other psychiatric offices that would accept Medicaid funding.

The results of our study support previous research indicating the need for specialized training of psychiatric professionals in PED.[3,5,18,19] Our review of the literature suggests that there are no other studies on the impact of specialized training of psychiatric professionals in PED in the Southeast. Based on the implications of this study, it is evident that health care systems have an impetus to invest in mental health services for a number of reasons: (1) overall quality of care is enhanced in the ED, (2) efficiency of care is increased through reduced PED LOS, and (3) adherence to mental health regulations is maintained.

Although our study validates the need for trained psychiatric professionals in PED, we must recognize a number of important limitations. First, due to the nature of the study, a retrospective study design is not the best method to determine accurate LOS and we feel that a prospective time-study design would be more appropriate. Second, we recognized that the analysis should include additional variables (eg, cost of the program, labor cost of the social workers, administrative cost, and revenue of patient seen) in order for the results of our intervention to be more meaningful and potentially reproducible. However, we believe identifying the payor source in the present design will allow for a more sophisticated cost analysis in future studies.

Third, there were no prejob and postjob satisfaction surveys of the ED staff or patients and families. Staff report suggested that there was increased job satisfaction; however, our study did not incorporate an objective measurement to reflect that assertion. Fourth, without expert validation, it was not possible to assess the role of criteria-based mental disorders on PED LOS. In addition, we did not evaluate whether the amount of time spent or the degree of training of the evaluator played a differential role in the outcome of our report. Another limitation to our study derives from our inability to track access to health care pre- and post-PED point of contact. Finally, our report did not explore the potential impact of limited mental health resources in the Southeast on LOS or cost per visit.

CONCLUSIONS

Although this model of care can have significant costs associated with it, the efficiency of care for psychiatric pediatric patients in the ED improved after targeted training of ED staff and provision of these specialized services within the PED. Our report supports the assertion that increasing the training of health care providers who work in the PED can maximize symptom assessment and treatment and can reduce LOS and cost per visit. Future studies are needed to continue to improve accuracy and efficiency of the provision of mental health care in the PED.

REFERENCES

1. US Department of Health and Human Services: Mental Health: A Report of the Surgeon General. Rockville MD: US Department of Health and Human Services, Children's mental health: A national agenda. Conference summary. Accessed November 10, 2013 from http://www.ncbi.nlm.nih.gov/books/NBK44233/pdf/TOC.pdf.
2. Hoyle JD, White JL. Treatment of pediatric and adolescent mental health emergencies in the United States. *Prehosp Emerg Care*. 2003;7:66–73.
3. Grupp-Phelan J, Harman JS, Kelleher JK. Trends in mental health and chronic condition visit by children presenting for care at U.S. emergency departments. *Public Health Rep*. 2007;122:55–61.
4. Testa A, Giannuzzi R, Sollazzo F, et al. Psychiatric emergencies (part I): psychiatric disorders causing organic symptoms. *Eur Rev Med Pharmacol Sci*. 2013;17:55–64.
5. Grover P, Lee T. Dedicated Behavioral Health Unit. Serving the unique and individual needs of children in behavioral health crisis. *Pediatr Emerg Care*. 2013;29:200–202.
6. Gopalan G, Goldstein L, Klingenstein K, et al. Engaging families into child mental health treatment: updates and special considerations. *J Canada Acad Child Adolesc Psychiatr*. 2010;19:182–196.

7. Dolan MA, Fein JA, Committee on Pediatric Emergency Medicine. Pediatric and adolescent mental health emergencies in the emergency medical services system. *Pediatrics*. 2011;127:1356–e1366.
8. Claudius I, Mahrer N, Nager A, et al. Occult psychosocial impairment in a pediatric emergency department population. *Pediatr Emerg Care*. 2012;28:1334–1337.
9. Christodulu KV, Lichenstein R, Weist M, et al. Psychiatric emergencies in children. *Pediatr Emerg Care*. 2002;18:268–270.
10. Melese-d'Hospital IA, Olson LM, Cook L, et al. Children presenting to emergency departments with mental health problems. *Acad Emerg Med* 2002; 5519–528.
11. Gearing RE, Mian IA, Barber J, et al. A methodology for conducting retrospective chart review research in child and adolescent psychiatry. *J Can Acad Child Adolesc Psychiatr*. 2006;15:3.
12. Gilbert EH, Lowenstein SR, Koziol-McLain J, et al. Chart reviews in emergency medicine research: where are the methods? *Ann Emerg Med*. 1996;27:305–308.
13. International Classification of Diseases, Ninth Revision, Washington: US Department of Health & Human Services. 1998.
14. Chambers WJ, Puig-Antich J, Tabrizi MA. *The ongoing development of the Kiddie-SADS (Schedule for Affective Disorders and Schizophrenia for School-Age Children)*. San Diego, CA: Presented at the American Academy of Child Psychiatry Annual Meeting.
15. Aratani Y, Addy S. Disparities in repeat visits to emergency departments among transition-age youths with mental health needs. *Psychiatr Serv*. 2014;65:685–688.
16. Waseem M, Prasankumar R, Pagan K, et al. A retrospective look at length of stay for pediatric psychiatric patients in an urban emergency department. *Pediatr Emerg Care*. 2011;27:170–173.
17. Philip Y, Steiner I, Reinhardt G. Analysis of factors influencing length of stay in the emergency department. *Can J Emerg Med*. 2003;5:155–161.
18. US Department of Health and Human Services. Emergency medical treatment and labor act: Authorization and responsibilities. Available at: https://www.cms.gov/Regulations-and-Guidance/Legislation/EMTALA/emtalatag.html. Accessed September 10, 2013.
19. Case SD, Case BG, Olfson M, et al. Length of stay of pediatric mental health emergency department visits in the United States. *Am Acad Child Adolesc Psychiatr*. 2011;50:1110–1119.