Emergency Department Use by Young Adults With Chronic Illness Before and During the COVID-19 Pandemic

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Contribution to Emergency Nursing Practice

- Emergency departments provide much of the care for young adults with chronic health conditions, and using the emergency department for chronic disease management may lead to fragmented care. Many encounters are for ambulatory care sensitive conditions and are potentially avoidable ED encounters. Nationally during the coronavirus disease pandemic, there was a significant decrease in ED visits.
- In this study, the total ED encounters for young adults with certain ambulatory care sensitive conditions decreased during COVID-19 but varied by chronic condition. The encounters and admissions for individuals with mental health conditions increased dramatically during the COVID-19 pandemic. Our study showed an increase in hospital admissions for young adults with diabetes.
- Important implications for clinical emergency nursing reflected in the results of this study are the need for mental health resources in the emergency department, especially during a pandemic. An increase in admissions for diabetes emphasized the importance of a connection to primary care and patient education.

Abstract

Introduction: There was a significant decrease in emergency department encounters during the COVID-19 pandemic. Our large urban emergency department observed decreased encounters and admissions by youths with chronic health conditions. This study aimed to compare the frequency of emergency department encounters for certain young adults before the pandemic and during the COVID-19 pandemic.

Methods: A retrospective cohort study using medical records of patients ages 20 to 26 years from October 2018 to September 2019 and February 2020 to February 2021. Files set for inclusion were those with a primary diagnosis of human immunodeficiency virus, diabetes mellitus, epilepsy, cerebral palsy, sickle cell disease, asthma, and certain psychiatric disorders for potentially preventable health events.

Results: We included 1203 total encounters (853 before the pandemic and 350 during the pandemic), with the total number of subjects included in the study 568 (293 before the pandemic to 239 during the pandemic). During the pandemic, young adults with mental health conditions (53.1%) accounted for most encounters. Encounters requiring hospital admissions increased from 27.4% to 52.5% during the pandemic, primarily among patients with diabetes (41.8% vs 61.1%) and mental health conditions (50% vs 73.3%).

Discussion: The number of young adults with certain chronic health conditions decreased during COVID-19, with encounters for subjects with mental health conditions increasing significantly. The proportion of admissions increased during the pandemic with increases for subjects with mental health disorders and diabetes. The number of frequent users decreased during COVID-19. Future research is needed to understand better the causes for these disparities in young adults with chronic

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conditions who use the emergency department as a source of care.

Key words: Young adults; Chronic health conditions; Emergency department; Pandemic; COVID-19

Introduction

BACKGROUND/RATIONALE

Emergency departments provide a gateway to the health care system for many individuals; during 1996 to 2010, ED visits represented almost half (47.7%) of health care encounters in the United States[1] and in 2019 the emergency department managed 70% of daily overall hospital admissions nationally.[2] Most ED encounters result in discharge, a trend that has increased over time across all age groups.[3] Except for adults aged 65 years and older, young adults ages 18 to 44 years are the most frequent users of emergency departments.[1,3] Of note, young adults with chronic health conditions, such as asthma and diabetes, have the highest ED utilization[4] given that the emergency department provides an access point when acute symptoms related to the chronic illness are present.[5] Although adolescents (ages 13-18 years old) and young adults (ages 19-24 years old) (AYAs) do not differ from each other in the number of ambulatory health care visits over a 1-year period, a greater proportion of that care occurs in emergency departments.[6] Many ED visits are for ambulatory care sensitive conditions and are potentially avoidable.[7] Ambulatory care sensitive conditions are those conditions listed by the Centers for Medicare and Medicaid in which illnesses are potentially preventable if subjects receive optimum outpatient care.[8]

The transition from pediatric to adult care is challenging for many AYAs with chronic health conditions.[9,10] During transition, AYAs must assume responsibility for their self-care and form new relationships with adult health care providers. Young adults with chronic health conditions require more health care services than similar age peers without these impairments[5,11] and may lack the necessary knowledge and skills to transition successfully to adult medical services. A national survey of 20,708 youths with and without chronic conditions found that only 17% of those with chronic health conditions met measures of transition planning such as transition education, suggesting readiness for successful transition.[12] Despite their medical complexity, most ED visits for young adults with chronic health conditions occur in general emergency departments.[4,13] In a recent study, researchers examined ED visits among young adults with chronic conditions enrolled in a primary care network and identified young adults with sickle cell disease (SCD), type 1 diabetes, and seizure disorders as the highest ED users.[14] Other studies have reported a high ED number of encounters for young adults with asthma[15] and HIV.[16]

The Centers for Disease Control and Prevention reported that ED visits decreased by 42% during the COVID-19 pandemic[17] with the most significant decrease in adult and pediatric visits for nonmedically urgent complaints.[18] Approximately 2 of 5 participants in a nationally representative survey reported delaying care during the pandemic because of concern about exposure to COVID-19.[19] Although survey respondents with 1 or more chronic health conditions most frequently reported delaying nonurgent care, 10.4% of respondents with 1 chronic condition and 22.7% of respondents with 2 or more chronic conditions reported either delaying or avoiding use of emergency services.[19] Those seeking help for mental health conditions seem to be the exception to these findings. Studies done early in the COVID-19 pandemic found that the demand for mental health services increased significantly[20,21] and especially for young adults.[22] Similar to emergency departments across the country, our large urban emergency department in New York City experienced a dramatic change in overall registrations during the pandemic. In this health care system, overall ED admissions decreased significantly in patients diagnosed as having acute stroke and congestive heart failure.[23]

OBJECTIVES

ED visits by young adults with chronic conditions during the pandemic are unknown. The aim of this study was to measure the impact of COVID-19 on ED registrations and admissions for young adults with select chronic health conditions before and during the COVID-19 pandemic.

Methods

STUDY DESIGN/SETTING/PARTICIPANTS

We used a retrospective cohort design to address study aims. An analysis of the medical records of AYAs with certain primary diagnoses and ambulatory care sensitive conditions before and during COVID-19 was set for inclusion. We analyzed electronic health record (EHR) data from ED encounters of young adults age 20 to 26 years

TABLE 1
ICD-10 codes by diagnosis

Chronic disease type	ICD-10 codes
Asthma	J40-J82.83
Cerebral palsy	G80.0-G80.9
Diabetes (types 1 and 2)	E08.01-E13.9
HIV	B20, Z21, B97.35, R75
Mental health condition	F30.10-F33.9
Sickle cell disease	D57.00-D57.819

ICD-10, International Classification of Diseases, Tenth Revision.

with 6 chronic health conditions (asthma, cerebral palsy, diabetes [types 1 and 2], HIV, mental health conditions, and SCD) who received care at 1 large metropolitan not-for-profit teaching hospital in New York City, which provides emergency services to approximately 250,000 patients annually.[24] Table 1 lists the International Classification of Diseases, Tenth Revision, codes queried by chronic health condition diagnosis to elicit ED encounters for these young adults. The International Classification of Diseases, Tenth Revision, codes capturing acute disease-specific diagnoses were selected to represent potentially preventable ED encounters.

EHR data were queried for data in 2 time frames: October 1, 2018, to September 30, 2019 (before the COVID-19 pandemic), and February 1, 2020, to February 28, 2021 (during the COVID-19 pandemic). In each time frame, we categorized patients with 4 or more encounters during that period as frequent ED users.[25-27] The institution's institutional review board approved this study before study initiation.

To examine changes in ED volume during the pandemic, we analyzed ED encounters at both the patient and encounter levels. At the patient level, we grouped patients by the timing of their emergency department, those encounters before but not during the pandemic, those with encounters during the pandemic but not before, and those with encounters both before and during the pandemic. At the encounter level, we grouped encounters as having occurred either before or during the pandemic.

In February 2020, the hospital changed its EHR system from Allscripts Touch Works (Chicago, IL) to Epic (Epic Health Services, Inc, Dallas, TX). Medical record numbers for established patients changed with the introduction of the new system. Patient name and date of birth were used to allow examination at the patient level across EHR systems. After categorization at the patient level, all data were de-identified.

VARIABLES/BIAS

For this study, variables of interest at the patient level included demographic characteristics (age, sex, race, ethnicity), chronic disease type, number of ED encounters during each period (before and during the pandemic), proportion of young adults who were frequent ED users (4 or more visits) before or during the pandemic, and health insurance type (commercial, government sponsored [Medicaid, Managed Medicaid, Medicare], uninsured, not reported). In an effort to minimize bias, variables at the encounter level included chronic disease type and ED disposition (admit, discharge from the emergency department, incomplete encounter [patient left the emergency department before disposition], other disposition [included walkouts before or after medical screening examination and patients who left emergency department against medical advice], and not reported).

DATA ANALYSIS/STATISTICAL METHODS

EHR files from October 1, 2018, to September 30, 2019, and February 1, 2020, to February 28, 2021, representing prepandemic and pandemic encounters were merged into 1 file. Two data sets were created from this merged file: an encounter-level data set and a patient-level data set. To create the patient-level data set, we stratified encounters by name, date of birth, medical record number, and date of encounter to identify encounters of unique individuals. We then categorized individuals as having encounters by the time of occurrence: before the pandemic, during the pandemic, and during both time frames. For each individual, 2 additional variables were created: number of encounters before the pandemic and number of encounters during the pandemic. Data were analyzed at the patient level and at the encounter level using descriptive statistics. At the patient level (Table 2), groups were compared using analysis of variance for continuous variables and chi-square or Fisher's exact tests for categorical variables. For continuous variables that achieved statistical significance ($P < .05$), post hoc comparisons were made using the Tukey's range test; for categorical variables that achieved statistical significance ($P < .05$), post hoc comparisons were made using a Bonferroni correction ($P < .017$).

TABLE 2

Comparison of demographic characteristics table of young adults with chronic conditions who used the emergency department before the pandemic (October 1, 2018-September 30, 2019) and during the COVID-19 pandemic (February 1, 2020-February 28, 2021)

	Prepandemic		Pandemic		Both		*P* value
Total population	***n* = 293**		***n* = 239**		***n* = 36**		
variables	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	
Age (y)	23.70	2.00	23.30	1.90	22.60	1.60	< .001*
Encounters	2.20	2.00	1.20	0.60	7.80	10.40	< .001*
Variables	**n**	**%**	**n**	**%**	**n**	**%**	***P* value**
Sex							
Male	115	39.2	116	48.5	15	41.7	
Female	178	60.8	123	51.5	21	58.3	.1
Race							
Asian	3	1	2	0.8	–	–	
Black	40	13.7	62	25.9	9	25	
Native American	–	–	1	0.4	–	–	
White	37	12.6	54	22.6	1	2.8	
Other race	204	69.6	87	36.4	23	63.9	
Not reported	9	3.1	33	13.8	3	8.3	< .001†
Ethnicity							
Latino	84	28.7	111	46.4	7	19.4	
Non-Latino	29	9.9	93	38.9	6	16.7	
Not reported	180	61.4	35	14.6	23	63.9	< .001†
Chronic illness type							
Asthma	175	59.7	64	26.8	16	44.4	
Cerebral palsy	4	1.4	1	0.4	–	–	
Diabetes (types 1 and 2)	68	23.2	25	10.5	1	2.8	
HIV	7	2.4	5	2.1	1	2.8	
Mental health condition	11	3.4	127	53.1	2	5.6	
Sickle cell disease	28	9.6	17	7.1	16	44.4	< .001*
Single ED encounter	140	47.8	209	87.4	7 pre 22 during	61.1	< .001*
Frequent users (>4 visits)	44	15	2	0.8	17	47.2	< .001*
Health insurance type							
Commercial	63	21.2	69	28.9	1	2.8	
Government sponsored	200	68.3	157	65.7	–	94.4	
Uninsured	30	10.2	5	2.1		2.8	
Not reported	–	–	8	3.3		–	< .001*

ANOVA, analysis of variance; COVID-19, COVID-19; ED, emergency department.

For those who used emergency department both before and during the pandemic, mean encounters were 5.9 ± 10.2 in the year before the pandemic and 1.9 ± 1.4 during the pandemic; government-sponsored insurance = Medicaid, Managed Medicaid, and Medicare; ANOVA with post hoc Tukey test used to analyze continuous variables age and encounters; all other variables analyzed using chi-square with post hoc Bonferroni correction.

* Significant differences among all subgroups in post hoc comparisons.

† Significant differences between groups 1 (prepandemic only) and 2 (postpandemic only); significant differences between groups 3 and 2 (use of the emergency department during both time periods), but no differences noted between groups 1 and 3.

Results

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

In total, 1203 encounters (853 before pandemic and 350 during pandemic) were identified and represent ED encounters by 568 young adults with chronic conditions. Table 2 compares patient characteristics by ED utilization for each period of time. The number of young adults who frequented the emergency department decreased during the pandemic and varied by chronic illness type. Before the pandemic, approximately half of young adults had a single ED encounter compared with during the pandemic when 87.4% were single encounters. During the pandemic, young adults who frequented the emergency department were more frequently of Black race and Hispanic ethnicity than those who used the emergency department before the pandemic. Before the pandemic, young adults with asthma most frequently used the emergency department, whereas, during the pandemic, the largest group was those who used the emergency department for treatment of a mental health condition. In post hoc analyses to examine differences among patient subgroups, patients significantly differed in all characteristics with the exception of race and ethnicity. Patients who used the emergency department before the pandemic differed in race and ethnicity from those who used the emergency department during the pandemic; similar differences were found between those who used the emergency department during the pandemic and the group who used the emergency department during both time points. There were no differences in race and ethnicity between those who used the emergency department before the pandemic and those who used the emergency department at both time points.

ED ENCOUNTERS

Table 3 compares ED visits at the encounter level. Compared with prepandemic by chronic disease type, the number of encounters for asthma and diabetes decreased during the pandemic, whereas encounters for mental health disorders increased during the pandemic. Overall, the proportion of ED encounters requiring hospital admission increased during the pandemic. Frequent users were, for the most part, patients with a diagnosis of asthma, SCD, and diabetes (data not presented). Before the pandemic, most encounters were represented by frequent users, whereas they significantly decreased during the COVID pandemic.

Discussion

This study aimed to compare the frequency and types of ED encounters of young adults with 6 chronic conditions at 1 urban emergency department before and during the COVID-19 pandemic. Young adults with chronic illnesses are of much concern because they face many challenges in achieving optimum health. The theory of Self-Care of Chronic Illnesses says that experience, skills, and symptom management are some factors that influence achieving illness stability.[28] The movement from a pediatric to an adult health care setting has potential adverse events and poor outcomes for young adults.[29] Health deficits compound the challenges of achieving developmental milestones in young adults.[30,31] Young adults who use the emergency department to care for their chronic illnesses may lack the skills, resources, or knowledge necessary to manage their health.

Consistent with findings of other studies,[17,18,32] total ED encounters for young adults decreased during COVID-19 but varied by chronic condition. Although total encounters for individuals with asthma, diabetes, and SCD decreased during the COVID-19 pandemic, encounters for individuals with mental health conditions increased. Noteworthy was an increase in hospital admissions for young adults with diabetes and mental health conditions (Table 4). Many may have avoided coming to the hospital owing to a lack of information about the disease and fear of exposure to the COVID-19 virus in the hospital setting.

Insurance coverage of this sample of young adults did not change significantly from before the pandemic to during the COVID-19 pandemic, with most patients having a form of government-sponsored insurance. Only a small proportion of young adults who came to the emergency department were uninsured, and the proportion of uninsured patients decreased during the COVID-19 pandemic. In contrast to our study, other research has found that this age group is 1 of the largest populations who are without health insurance.[33] Other researchers found an increase in uninsured patients during COVID-19,[20] whereas another study found the rate of patients presenting with government insurance varied during the pandemic.[34] The cause for the decrease in the number of uninsured patients at our institution is unknown. It may suggest that the state-run Medicaid expansion program during COVID may have decreased the number of uninsured in this population.[35]

During the pandemic, young adults with mental health conditions were the most frequent users of the emergency department and had the highest proportion of encounters and hospital admissions. This outcome is

TABLE 3
Comparison of department encounters of young adults with chronic conditions who used the emergency department before the pandemic (October 1, 2018-September 30, 2019) and during the COVID-19 pandemic (February 1, 2020-February 28, 2021)

	Prepandemic		During pandemic		*P* value
	n = 853		*n* = 350		
Variable	**n**	**%**	**n**	**%**	
Encounters by chronic illness type					
Asthma	486	57	87	24.9	< .001
Cerebral palsy	6	0.7	1	0.3	< .001
Diabetes (types 1 and 2)	153	17.9	36	10.3	< .001
HIV	11	1.3	10	2.9	< .001
Mental health condition	32	3.8	135	38.6	< .001
Sickle cell disease	165	19.3	81	23	< .001
Encounters for frequent ED users (>4 visits)	436	51.1	33	9.4	< .001
ED disposition					
Admit	233	27.3	184	52.5	< .001
Discharge	537	63	157	44.9	< .001
Incomplete encounter	79	9.3	8	2.3	< .001
Other disposition	4	0.5	–	–	
Not reported	–	–	1	0.3	< .001

COVID-19, coronavirus disease 2019; ED, emergency department.

significant and demonstrates the importance of having mental health services in emergency departments. This finding is consistent with other research[21,36,37] and may be caused, in part, by a lack of available resources in communities where offices were closed, and mental health care was provided virtually.[38] Other causes may be that young adults with mental health issues have difficulty transitioning to adult care services and may not have established relationships with adult providers in the community.[39] Conversely, some research demonstrated a decrease in hospitalizations for mental health conditions when patients received outpatient mental health care.[38,40] In our sample, most young adults who came to the emergency department during the pandemic for treatment of a mental health condition had only 1 ED encounter, suggesting that the emergency department may have been successful in providing a conduit to community mental health services for these individuals. Our findings may also suggest that some mental health conditions emerged for the first time or developed to the level that they required treatment for the first time during the pandemic owing to heightened stress.[22] Some patients may have had an acute exacerbation due to a pandemic-related stressor that subsequently subsided. Having mental health services readily available during a pandemic has been recommended.[41] Going forward, having mental health resources as part of any ED team is an integral part in meeting patients' needs during a pandemic.

During the COVID-19 pandemic, ED encounters decreased for young adults with the primary diagnoses of asthma, diabetes, and SCD. ED encounters resulting in hospital admissions increased for patients with diabetes but significantly decreased for young adults with asthma. Before COVID-19, in New York State, the most frequent reasons for admissions from the emergency department were for asthma and diabetes.[42] Staying home and practicing social distancing may have reduced communicable disease transmission and chronic disease exacerbation[43,44] especially for those with asthma. Alternatively, young adults with chronic conditions may have avoided the emergency department during the pandemic because of concerns about being exposed to COVID-19 in the emergency department or about long ED wait times from the increase of patients presenting with COVID-19 related illness.[45] The increase in the percentage of young adults with diabetes who required hospital admission suggested that these patients may have waited longer to seek care and thus presented to the emergency department much sicker.

TABLE 4

Comparison of department encounters to admissions of young adults with chronic conditions who used the emergency department before the pandemic (October 1, 2018-September 30, 2019, $n = 853$) and during the COVID-19 pandemic (February 1, 2020-February 28, 2021, $n = 350$)

Prepandemic				Pandemic			
Chronic condition	Encounter	Admit	%	Encounter	Admit	%	*P* value
Asthma	486	60	12.4	87	13	14.9	
Cerebral palsy	6	4	66.6	1	0	0	.50
Diabetes (types 1 and 2)	153	64	41.8	36	22	61.1	.43
HIV	11	8	72.7	10	6	60	.04
Mental health condition	32	16	50	135	99	73.3	.66
Sickle cell disease	165	81	49.1	81	44	54.3	< .001

HIV, human immunodeficiency virus.

Similar to the findings of another study,[43] our study showed a decrease in the number of frequent users during the COVID-19 pandemic. This may suggest the avoidance of medical care during the pandemic for fear of exposure to diseases by patients at an increased risk of severe illness.[19,45] It is unclear, particularly for the subset of our sample with frequent ED use either before or during the pandemic, whether the emergency department was the only source of care or whether it was a place used when their usual source of care was unavailable. Research has shown frequent ED users may benefit from case management programs, including inpatient and outpatient monitoring. Case management programs that include home care visits may effectively reduce encounter rates and improve overall health.[46-48] Identifying frequent users and initiating interventions, such as a home monitoring program by health care providers before a crisis, may be helpful during times of extreme adversity.

Given that ED use is common among young adults with chronic health conditions,[14,49-51] strategies are needed to decrease avoidable ED encounters in young adults with chronic health conditions. Notably, with the exception of 36 young adults with ED encounters both before and during the pandemic, young adults who frequented the emergency department in the year before the pandemic did not use the emergency department during the pandemic. It is possible that the emergency department helped establish connections to primary care for these young adults. During the pandemic, use of the emergency department by most young adults in this sample limited use to 1 visit and may support the theory that accessing outpatient care was difficult during this time. Whether or not patients were able to connect to outside resources is unknown and further research is needed in this area.

More than half of ED encounters before the pandemic and almost half of ED encounters during the pandemic resulted in discharge from the emergency department. Most of these encounters of this type were potentially avoidable with established outpatient care. Young adults with chronic illness require daily disease self-management and ongoing disease-specific monitoring from a usual source of care to maintain their health. Lacking either or both can result in poor medication adherence, disease exacerbations, and disease progression. In either case, using the emergency department as a source of episodic nonemergency care may lead to fragmented care[52-54] and a lack of preventive care.[55-57]

In this emergency department, the triage nurse is responsible for screening patients for medical issues, including psychiatrist complaints, and assigning them to areas in the emergency department where they will receive the appropriate care. During the pandemic, the emergency department maintained its comprehensive psychiatric emergency program area, staffed with full-time psychiatrists, psychiatric nurse practitioners, social workers, and registered nurses specially trained in psychiatry. Decisions for admission are made solely by the psychiatrists, and most of visits and admissions were diagnoses of major depressive disorder, bipolar 1, and mania during this time. In addition, the team providers make the appropriate referrals to outpatient psychiatric resources. During the pandemic, there was a significant need for medical beds, and the organization converted many inpatient psychiatric beds to medical beds while maintaining 1 inpatient psychiatric hospital. This study showed a significant increase in psychiatric admissions despite the decrease in inpatient beds.

Limitations

This study has several limitations. First, data were limited to young adults with 6 chronic health conditions who used 1 emergency department in New York City and reflected a 1-year time frame before and during the pandemic. We did not stratify young adults by either diabetes type or specific mental health condition. Furthermore, ED encounters were limited to those specific to chronic disease care. Therefore, the findings of this study may not be generalizable to other ED settings or chronic diseases not studied.

Implications for Emergency Nurses

In this study, the total ED encounters for young adults with certain ambulatory care sensitive conditions decreased during COVID-19 but varied by chronic condition. Emergency departments provide much of the care for young adults with chronic health conditions. The encounters and admissions for individuals with mental health conditions increased dramatically during the COVID-19 pandemic, stressing the importance of having mental health resources in the emergency department, especially during a pandemic. Young adults with chronic diseases require daily disease self-management and ongoing disease-specific monitoring from a usual source of care to maintain their health. Using the emergency department for chronic disease management may lead to fragmented care. Increase in hospital admissions for young adults with diabetes emphasizes the importance of a connection to primary care and patient education.

Conclusion

This study's findings provide insight into ED use by young adults with chronic health conditions during the COVID-19 pandemic. Significant increases in encounters for young adults with mental health conditions suggest that it is imperative to have mental health resources in the emergency department and the availability of referrals to outpatient resources. Outreach programs may decrease admission rates for young adults with chronic illnesses, especially those young adults with diabetes. Transitioning young adults with chronic conditions from pediatric to adult care is a complex endeavor that has become a public health priority. Future research is needed to understand why young adults with chronic conditions use the emergency department as a frequent source of care and the potential difficulties they may encounter when using the adult health care system.

Author Disclosures

Conflicts of interests: none to report.

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