Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Effects of the COVID-19 pandemic in a psychiatric emergency service: Utilization patterns and patient perceptions

The COVID-19 pandemic has had unprecedented effects on healthcare delivery in the United States [1]. Healthcare, including the provision of mental health services, has had to accommodate a "new normal" with a shift to increased utilization of virtual care, and fluctuating access to community health services [2]. Utilization of emergency services have been significantly affected internationally [3–7].

To better understand the early impacts of the COVID-19 pandemic on youth and adults seeking care in a Psychiatric Emergency Services (PES) setting, this study aims to examine patterns of PES service utilization and assess various ramifications per patient report. This study was approved by the Institutional Review Board (HUM00180024) and did not utilize any funding. The study took place at a large Midwestern academic medical center PES in the United States. All patients that presented during the study time period (March 16, 2020-May 17, 2020) were included. Approximately 7000 patients are seen annually at the site and include both pediatric and adult populations.

The study consisted of two components:

1) A retrospective analysis of visits to PES during the study period.
2) A questionnaire addressing patients' experiences stemming from the pandemic.

For the retrospective analysis, a study initiation date of March 16, 2020 was selected – aligning with the start-date of the state's first official stay-at-home order – with observation continuing through May 17, 2020. Patient demographic, diagnostic, length of stay, and disposition information were derived from the medical record, then compared with analogous data from the two preceding years (2018 and 2019). Analyses were conducted using STATA version 15. Statistical analyses considering differences in patient profile, by year, were conducted using either chi-square tests (for proportions) Kruskall-Wallis Analysis of Variance (for mean comparisons).

The patient questionnaire was administered for 7 weeks starting on March 28, 2020. The survey was given to all patients presenting to the PES in the defined time period, with participation being optional. For pediatric patients, either they or their parent/guardian could answer the survey. Prior to analysis, all survey respondents were de-identified. Survey analyses, within the 2020 sample, consisted of between-group comparisons (respondents vs. non-respondents, adult vs. pediatric respondents, and parent vs. patient respondents) and were completed using chi-squared tests. Where appropriate (cell $n < 5$), Fisher's exact tests were substituted.

Table 1
PES utilization and patient demographics, by year.

	2018 (n = 1238)	%	2019 (n = 1443)	%	2020 (n = 766)	%	Stat[1]	p
Gender							1.42	0.492
Female	670	54.1	814	56.4	423	55.2		
Male	568	45.9	629	43.6	343	44.8		
Age							28.5	**<0.001**
Pediatric	484	39.1	502	34.8	210	27.4		
Adult	754	60.9	941	65.2	556	72.6		
Ethnicity							7.70	0.261
White	924	74.8	1082	75.1	540	70.9		
Black	206	16.7	221	15.4	133	17.5		
Hispanic	43	3.5	56	3.9	35	4.6		
Other	63	5.1	81	5.6	54	7.1		
Insurance							1.20	0.549
Private	852	68.8	1011	70.1	520	67.9		
Public	386	31.2	432	29.9	246	32.1		
Disposition							41.0	**<0.001**
Admit/ Transfer	459	37.6	543	37.9	386	50.7		
Discharge	762	62.4	891	62.1	376	49.3		
	2018		**2019**		**2020**			
Visit Length							14.4	**0.001**
Hours (Median)	5.93		5.07		8.52			

[1] Chi2 for proportions; Kruskal-Wallis Rank Sum for mean comparisons.

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Table 2
Survey responses on mental health and pandemic experience

		N	% Per Question, (N Variable)[1]	% Per Respondents ($N = 271$)[1]
Survey Respondent[1]	Parent	93	35.6	34.3
	Parent	168	64.4	62.0
Survey Questions				
Q1. What is your/your child's primary reason for seeking care today?	Medical	7	2.9	2.6
	Mental	187	77.6	69.0
	Both	47	19.5	17.3
Q2. Do you know anyone personally who has Coronavirus?	Yes	25	9.4	9.2
Q3. Do you think that the Coronavirus played a role in your/your child's visit today?	Not at all	183	70.9	67.5
	Somewhat	49	19.0	18.1
	Definitely	26	10.1	9.7
Q4. How do you think the Coronavirus has increased your/your child's symptoms?	More Anxiety	149	70.6	55.0
	More Depression	127	59.9	46.9
	More Psychosis	30	14.6	11.1
	More Substance Abuse	27	13.17	10.0
	More Self-Injury	43	21.0	15.9
	More Aggression	49	28.8	21.8
	More Conflict	71	34.1	26.2
	More Obsessive-Compulsive	44	21.4	16.2
	More Suicidal	73	35.1	26.9
	No Change	34	16.43	12.5
Q5. Has the Coronavirus caused any changes/closings of your/your child's mental health or other care providers?	No	100	47.4	36.9
	Yes	74	35.1	27.3
	Not in Treatment	37	17.5	13.7
Q6. If so, do you think the lack of access to care led to your/your child's need to come to the ER?[2]	Yes	29	42.65	10.7
Q7. Did the Coronavirus delay your/your child's coming to the ER due to fears of getting exposed?	Yes	47	22.1	17.3
Q8. Has the Coronavirus affected you/your child in any other ways?	Fear	85	47.2	31.4
	Inability	109	59.6	40.2
	Access	24	14.0	8.9
	Stress	74	41.3	27.3
	Childcare	16	9.1	5.9
	Structure	101	57.1	37.3
	Boredom	110	62.2	40.6
	Financial	54	31.2	19.9
	Socialize	107	59.4	39.5

[1] Percentages may not sum to 100% due to missing values; Due to variability in response rates, by question, figures have been calculated and presented as both 1) proportion of respondents who answered the question and 2) proportion of total survey respondents. The larger the difference between the first and second columns, the larger the number of missing responses for a given question.
[2] Q6 respondents are a subset of Q5 respondents.

A breakdown of patient volumes and service utilization, by key features, are provided in Table 1. Overall, the total number of patient visits in 2020 (766) was reduced by nearly half (46.9%) relative the previous year (2019 $n = 1443$) and 38% when compared to 2018 ($n = 1238$). These differences were driven, in part, by a significant drop in the proportion of pediatric patients seen in 2020 (27.4%), relative to 2018 (39.1%) and 2019 (34.9%); $p < .001$). Significant differences in dispositions were also evident, with a significantly higher proportion of PES patients being psychiatrically admitted (50.7%) in 2020, compared with 2018 (37.6%) and 2019 (37.9%; $p < .001$). Length of stay in the PES rose significantly in 2020, reaching a median of 8.52 h in 2020, relative to 5.93 and 5.07 h in 2018 and 2019, respectively. No meaningful differences in PES service utilization by gender, race/ethnicity, or insurance status (public vs private) emerged in cross-year comparisons.

Of the 566 patients seen in PES during the study period, 48.9% elected to complete the survey. An overview of the survey content, and aggregate responses, is presented in Table 2. Almost a third (29%) of respondents indicated the pandemic had somewhat or definitely played a role in their (or their child's) visit. Most reported experiencing increased anxiety (70.6%) and depression (59.9%) attributable to COVID-19. Substantial increases in self-reported self-injurious behavior (21%), aggression (28.8%), interpersonal conflict (34.1%), and suicidality (35.1%) attributable to COVID-19 were also reported.

Crucially, more than a third (35.1%) of respondents indicated reduced access to mental healthcare as a result of COVID-19. Of these, 42.7% indicated that these alterations had directly contributed to their need to seek emergency care, with others reporting delaying care due to fears of COVID-19 infection (22.1%).

Together, these findings demonstrate a significant and direct impact of the pandemic on psychiatric emergency service patient volumes and utilization, consistent with national and international reports regarding more general emergency settings [8,9]. The acuity of those who did present for PES care was higher, with a substantially greater percentage of patients requiring inpatient admission compared with previous years. It is possible that patients with less pressing issues preferred to avoid presenting to PES during this early phase of the pandemic. Lengths of stay in the PES were significantly higher during the study period, with difficulty admitting patients to inpatient psychiatric settings during the pandemic being a likely factor in delaying care and lengthening PES visits.

The pediatric population contributed to a notably smaller portion of PES visits during the study period, compared with prior years. The fact that schools were closed during the early part of the pandemic, but

were open during the same period in 2018 and 2019 is notable. Whereas early in the pandemic school-related stressors may have declined, more family conflict and domestic abuse has resulted from extended lockdowns [10].

This study has several limitations. It is a single-site study, and its time frame did not allow for examination of the effects of the COVID-19 pandemic on PES patient symptomatology and utilization patterns later in the course of the pandemic. Further, our volunteer survey methodology - though essential for the population under study – has inherent limitations, extending from participation bias to respondent subjectivity, including the possibility that questions were interpreted in variable ways.

Data from this study demonstrates the impact of the COVID-19 pandemic on patient symptoms and utilization patterns in the PES setting. Further research is warranted to examine other diagnostic and clinical factors in PES impacted by the pandemic, the longer-term impacts of the pandemic on PES care, and the effects across multiple sites.

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