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Psychiatric emergencies during the height of the COVID-19 pandemic in the suburban New York City area

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ABSTRACT

Background: This report characterizes patients presenting for psychiatric emergencies during the COVID-19 pandemic and describes COVID-19-related stressors.

Methods: Patients seen for emergency psychiatric evaluation during the height of the COVID-19 period (March 1–April 30, 2020; N = 201) were compared with those in the immediate Pre-COVID-19 period (January 1–February 28, 2020; N = 355), on sociodemographic characteristics, psychiatric diagnoses, symptoms, and disposition. Patients tested positive for COVID-19 were compared with those that tested negative on the same outcomes. Prevalence and nature of COVID-19-stressors that influenced the emergency presentation were rated.

Outcome: The most common psychiatric diagnoses and presenting symptoms during both periods were depression and suicidal ideation. Comparing the Pre-COVID-19 and COVID-19 periods, a significant decline in emergency psychiatric volume was observed in children and adolescents (C/A), but not adults. COVID-19 period C/A patients had more new onset disorders and were more likely to be admitted to inpatient care, but were less likely to present with suicide attempts, impulse control disorders and agitation/aggression. Adults were more likely to have no access to outpatient care, present with anxiety disorders, and were also more likely to be admitted for inpatient care. COVID-19 directly affected the psychiatric emergency in 25% of patients, with the more severe stressors triggered by fear of COVID infection (including psychosis), actual COVID infection in self or family members, including death of a loved one. COVID-positive patients were more likely to have psychosis, including new-onset, and were less likely to be depressed/suicidal compared to their COVID-negative counterparts.

Conclusion: This report demonstrates the need for emergency psychiatric services throughout the COVID-19 pandemic and the need for clinical and diagnostic COVID-19 screening of psychiatric emergency patients. New and severe pathology underscore the need for enhanced outpatient access to tele-mental health, crisis hotline and on-line psychotherapeutic services, as well as psychiatric inpatient services with capacity to safely care for COVID-19 patients.

1. Introduction

Much has been discussed about the profound stress and the potential for mental health disorders generated by COVID-19 illness and its societal and economic consequences. Surprisingly little clinical data are available. Population based surveys from China during the height of their pandemic indicated anxiety, depression, and alcohol use reported by approximately one third of respondents. Young adults (18–40 years),

the elderly, women and more educated individuals reported highest levels of distress (Wang et al., 2020; Qiu et al., 2020). General population surveys of mental health in the United Kingdom and the United States indicated that approximately 33% of individuals met threshold criteria for a mental disorder (primarily depression and anxiety) during the COVID-19 pandemic, increased from 11 to 19% base rates prior to the pandemic (Pierce et al., 2020; Center for Disease Control and Prevention, 2020). Mental Health America online screenings increased

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400-fold in the months since the pandemic, with increases in depression, anxiety, suicidal ideation and psychosis risk (Medscape Medical News, 2020). All of these symptoms may lead to psychiatric emergencies, but clinical samples, including those with COVID-19 status, are lacking.

Among hospitalized COVID-19-positive patients, neuropsychiatric complications have been extensively described, including encephalopathy, altered mental status, encephalitis, dementia-like syndrome and psychosis (Varatharaj et al., 2020). The authors, as well as other researchers, have documented cases of new onset psychosis associated with COVID-19 infection, citing inflammatory, stress-related, and biological vulnerability factors (Ferrando et al., 2020; Parra et al., 2020).

This retrospective cohort study aimed to investigate clinical experience with psychiatric emergencies presenting to an Academic Medical Center Emergency Department in Westchester County, New York, in the initial weeks of the COVID-19 pandemic (COVID period: March 1–April 30, 2020) compared to a similar period prior to the pandemic (pre-COVID period: January 1–February 28, 2020). Westchester County, located 30 miles north of New York City with nearly one million people, was an epicenter of the New York pandemic. Westchester County recorded its first COVID-19 infection on March 2, 2020 and has since recorded over 38,000 cases of COVID-19 infection and 1459 deaths, most of which occurred between March 2 and April 30, 2020, the timeframe for this report. While not as hard-hit as New York City, the psychological and economic stresses of the COVID-19 pandemic were felt profoundly throughout the community. On March 10, New York established the nation's first coronavirus containment zone in Westchester County; on March 14, the first two COVID-19-related deaths occurred; on March 20, Governor Andrew Cuomo ordered all non-essential businesses and schools to close. By end of April, hospitals experienced a surge of hospitalizations approaching 18,000 per day and nearly 19,000 individuals in New York State lost their lives to COVID-19. During the initial COVID-19 period, outpatient mental health and substance abuse treatment programs closed to in-person visits, and were required to transition to tele-psychiatric services. Time lags and inconsistencies in implementation of these outpatient services created critical gaps in access during the COVID-19 period.

With this backdrop, the investigators sought to:

1. Compare volume, demographic, diagnostic and symptom characteristics of patients seen for emergency psychiatric evaluations (EPE) between the COVID and pre-COVID periods.
2. During the COVID period, determine the proportion of EPE patients with a significant COVID-19-related stressor or trigger and describe the nature and severity of these stressors.
3. During the COVID period, compare symptom presentation, diagnosis, and disposition in a subset of EPE patients who tested positive for COVID-19 in the ED to others who tested COVID-19 negative.

2. Material and methods

This study was conducted at and approved by the institutional review board of New York Medical College and Westchester Medical Center Health System (WMC Health), Valhalla, New York. Patients seen for EPE at WMC Health present from the community either voluntarily or involuntarily via emergency medical services or law enforcement, based on emotional or behavioral crises in the community. Patients are referred to and evaluated by the Emergency Psychiatry Service after a medical screening examination, laboratory and other testing are conducted, as appropriate. The Psychiatric Emergency Service is a specialized division of the Department of Psychiatry, consisting of attending and resident psychiatrists, psychiatrically trained nurses and patient care technicians, as well as social work case managers. The service is physically located in a wing of the Emergency Department (ED) with enhanced safety features. Patients under consideration in this study were evaluated by the service, were ambulatory and deemed to not have an acute medical condition that would require medical admission or

preclude their ability to be transferred to inpatient psychiatric treatment, if necessary. ED patients with psychiatric conditions but with serious acute medical issues requiring inpatient medical care are not included in this report as they would have been evaluated in the general ED and subsequently admitted to the medical/surgical services with follow-up by the psychiatric consultation-liaison psychiatric team.

For this study, the records of patients seen for EPE between January 1, 2020 and April 30, 2020 were obtained from the electronic medical record and analyzed for sociodemographic characteristics, primary psychiatric diagnosis, primary psychiatric symptom presentation, disposition, nature and severity of COVID-19 related stressors, and COVID-19 status, where available.

COVID-19-related stressors were derived from the evaluation narrative, and were categorized into one of ten major categories: COVID-19 Positive-Self; COVID-19 Positive-Family Member; COVID-19-related death of a loved one; Generalized Anxiety about the COVID-19 Pandemic; Concern about contracting COVID-19-Self; Concern about contracting COVID-19-Family; COVID-19-related delusion; stress related to quarantine; job loss; economic hardship. Further, the nature of the stressor was rated as none/minimal, moderate or severe based on the degree to which it influenced the nature and severity of the psychiatric emergency. This metric proved helpful in characterizing COVID-19-related stress in a survey of our behavioral health staff.

The data extractors (SL, SS) were trained on the record review instrument, including the COVID-19-stressor rating, and were supervised by the study PI. Inter-rater reliability on a subset of 10% of study records was high, exceeding 90%. Records on which there was disagreement were discussed and rated by the study team. Rapid COVID-19 testing using Cepheid®, an automated molecular test for the qualitative detection of SARS-CoV-2, the virus that causes COVID-19, became available to the ED on March 20, 2020 (Wolters et al., 2020). This test was subsequently used to screen patients for COVID-19 serological status prior to psychiatric admission, for known exposure to the virus and for differential diagnostic purposes when patients presented with symptoms suggestive of infection or new-onset psychiatric symptoms, particularly psychosis. Thus, there was a subset of EPE patients who had COVID-19 testing and results at time of presentation.

Descriptive statistics (frequency, %, mean (SD)) were utilized to report sample characteristics and COVID-19 stressors, Chi-square and *t*-tests were utilized to analyze potential differences across groups of interest. The primary comparison groups included: EPE patients seen during the Pre-COVID-19 vs. COVID-19 periods, for child and adolescent (C/A) patients and adult patients respectively; EPE patients who tested COVID-19-positive vs. those tested COVID-19-negative; and C/A vs. Adult EPE patients with regards to the presence and characteristics of COVID-19 stressors.

3. Results

3.1. Overall sample

There were 355 patients seen for Emergency Psychiatric Evaluation (EPE) in the pre-COVID-19 period (January 1 through February 29, 2020) compared to 201 patients seen during the COVID-19 period (March 1, 2020 through April 30, 2020), representing a 43% decline in overall EPE volume ($p < 0.001$). Broken down by age group (Fig. 1), this decline was primarily accounted for by a statistically significant drop in percentage of EPE patients who were children and adolescents (C/A, <18 years), from 57% of the pre-COVID-19 population to only 32% of the patients during the COVID-19 period ($p < 0.0001$). In contrast, adult (>18 years) EPE volume dropped 11%, a non-significant change. When compared to overall ED medical/surgical volume, the 43% decline in overall EPE volume paralleled a more general decline in total emergency room volume, which declined by 35% ($p = \text{NS}$). However, C/A EPE volume declined 68%, a disproportionately larger decline than that observed in medical/surgical C/A ED volume of 56% ($p < 0.03$).

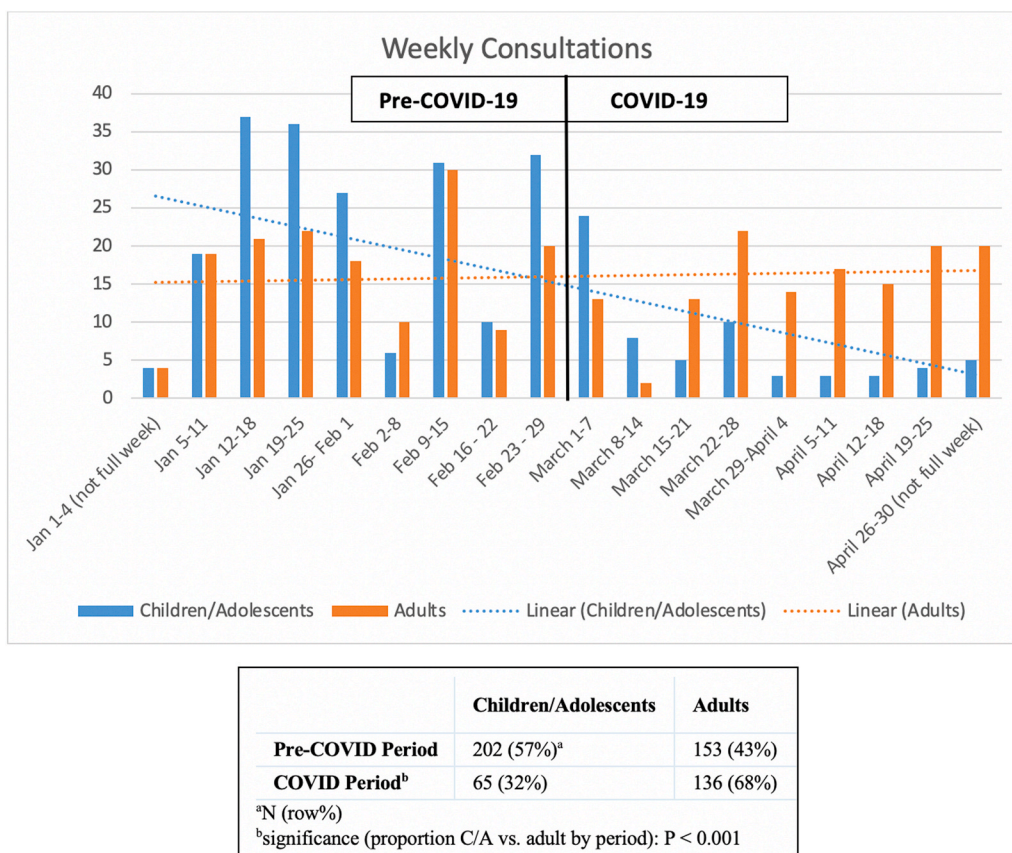


Fig. 1. Emergency psychiatric consultations by week January 1, 2020 through April 30, 2020.

3.2. Overall patient characteristics and outcomes

In the entire period under study, as seen in Table 2, the most common disorders for children and adolescents presenting for EPE were adjustment disorders, depressive disorders and impulse control disorders. The most common symptom presentations were depressed mood, anxiety and suicidal ideation. Among adults (Table 4), the most common disorders were Unipolar depressive disorders, bipolar disorder and psychotic disorders, while the most common symptoms were depressed mood, psychosis and suicidal ideation.

3.2.1. Comparison of patient characteristics and outcomes in the Pre-COVID-19 versus COVID-19 periods

3.2.1.1. Child and adolescent patients. There were no significant differences in age, gender, ethnicity, relationship status or living situation between those C/A patients seen in the pre-COVID-19 compared to the COVID-19 period (Table 1). However, patients seen during the COVID-19 period were significantly less likely to have a prior psychiatric history or outpatient psychiatric treatment (p < 0.01).

In terms of diagnostic characteristics and disposition (Table 2), C/A EPE patients seen during the COVID-19 period compared to the pre-COVID-19 period were less likely to have impulse control disorders and less likely to have symptoms of agitation and aggression upon presentation. They were more likely to have a presentation that included psychosis and less likely to have made a suicide attempt. Just over half of the C/A EPE population seen during the COVID-19 period were hospitalized on an inpatient unit, significantly greater than the 32% hospitalization rate during the pre-COVID-19 period (p < 0.02).

3.2.1.2. Adult patients (18 and older). Adult patients seen for EPE in the pre-COVID-19 versus COVID-19 periods (Table 3) were less likely to be

single, more likely to be unemployed and less likely to be a student in college. COVID-19 period patients were more likely to have no treatment or to be unable to contact their mental health provider.

In terms of diagnostic characteristics (Table 4), adult patients seen during the COVID-19 period were more likely to have an anxiety disorder and less likely to have symptoms of agitation or aggression, but there were no other significant diagnostic differences. Like C/A EPE patients, adult patients seen during the COVID-19 period were more likely to be admitted to an inpatient psychiatric unit (66% vs. 53% pre-COVID-19).

3.2.1.3. COVID-19-related stressors. Approximately 23% of C/A and 27% of adult patients seen for EPE during the COVID-19 period were judged to have a moderate to severe COVID-19-related stressor that was directly related to the clinical presentation. As seen in Table 5, the most frequent COVID-19-related stressors, regardless of age group, related to worry about contracting the infection in self and family, the stress of quarantine, loss of job and financial strain. Distress related to being tested/diagnosed COVID-19-positive, having a family member with COVID-19 or losing a family member to COVID-19 was prevalent in adults. Three patients had delusions that incorporated COVID-19 into their pathology (Fig. 2).

3.2.1.4. Comparison of EPE patients tested COVID-19 positive compared to those tested COVID-19 negative. During the COVID-19 period, 75 (37%) EPE patients were tested for COVID-19. Of patients tested, 18 were found to be COVID-19 positive and 57 were COVID-19 negative. Patients who tested positive for COVID-19 were more likely to be African-American or Hispanic, less likely to be employed full-time and more likely to be a student, but were otherwise similar in terms of age, gender distribution, relationship status or living situation (Table 6).

Table 1Comparison of Pre-COVID (January 1–February 28, 2020) and COVID (March 1–April 30, 2020) *Child and Adolescent* patient characteristics.

Patient Characteristic	Pre-COVID period	COVID period	Sig. (p, 95%)
Number of patients	202	65	
Age (mean)	13.6 (SD = 2.7)	13.8 (SD = 2.7)	0.65
Gender, N (%)			0.8
Female	111 (55.0%)	38 (58.5%)	
Male	85 (42.1%)	38 (40.0%)	
Other	3 (2.0%)	1 (0.7%)	
Ethnicity N (%)			0.8
White	66 (32.7%)	23 (35.4%)	
African American	53 (26.2%)	16 (24.6%)	
Hispanic	52 (25.7%)	17 (26.2%)	
Other/Unknown	27 (13.4%)	6 (9.2%)	
Relationship, N (%)			0.5
Single	190 (94.1%)	63 (96.9%)	
Relationship	12 (5.9%)	2 (3.1%)	
Married	0 (0.0%)	0 (0.0%)	
Separated/Divorced	0 (0.0%)	0 (0.0%)	
Living Situation, N (%)			0.6
Homeless	1 (0.5%)	0 (0.0%)	
Home/Apartment	143 (70.8%)	50 (76.9%)	
Group/Nursing Home	58 (28.7%)	15 (23.1%)	
Prior Psychiatric History, N (%)			0.01
Yes	155 (76.7%)	38 (58.5%)	
No	46 (22.8%)	27 (41.5%)	
Current Outpatient Care, N (%)			0.2
Yes, able to contact	159 (78.7%)	43 (66.2%)	
Yes, unable to contact	5 (2.5%)	2 (3.1%)	
No	33 (16.3%)	18 (27.7%)	
Unknown	5 (2.5%)	2 (3.1%)	
Legal History, N (%)			0.5
Yes, pending charges	3 (1.5%)	0 (0.0%)	
Yes, recent incarceration	3 (1.5%)	0 (0.0%)	
Yes, other	6 (3.0%)	1 (1.5%)	
No	190 (94.1%)	64 (98.5%)	

3.2.1.5. *Diagnostic characteristics of COVID-19 positive patients.* COVID-19 positive patients were significantly less likely to have a depressive disorder and suicidal ideation, but were more likely to present with psychotic symptoms and disorders compared to their COVID-19 negative patients (Table 7). Among the patients with psychotic symptoms and COVID-19 infection, four had new-onset psychosis, two had Bipolar Disorder with psychotic features, two had Schizophrenia and four had Schizoaffective Disorder.

4. Discussion

This is the first study to investigate in detail clinical characteristics and outcomes of emergency psychiatric presentations during the height of the first wave of the COVID-19 pandemic.

There is no doubt that COVID-19 has been associated with immense collective and individual stress, which continues as the pandemic rages in the USA. A social media survey posted from March 14–16, 2020, indicated that nearly 70% of 9009 participants were “very” or “extremely” concerned about COVID-19, with the primary worry being concern about contracting the virus and inability to get health care (Hoyer et al., 2020). While data such as these exist here and elsewhere, it is difficult, without clinical data, to determine the actual clinical impact on mental health. While the current data reflect clinical experience with psychiatric emergencies in suburban New York City area, they may shed light on the broader clinical impact of the pandemic.

Overall there was a 43% decline in emergency psychiatric

Table 2Comparison of Pre-COVID (January 1–February 28, 2020) and COVID (March 1–April 30, 2020) *Child and Adolescent* patient outcomes.

Patient Characteristic	Pre-COVID period	COVID period	Sig. (p, 95%)
Number	202	65	
Percentage of all EPE	56.9%	32.3%	<0.001
Primary Psychiatric Diagnosis, N (%)			
Adjustment Disorder	67 (33.2%)	23 (35.4%)	0.75
Anxiety Disorders	7 (3.5%)	2 (3.1%)	0.9
Bipolar Disorders	5 (2.5%)	4 (6.1%)	0.15
Depressive Disorders	68 (33.7%)	23 (35.4%)	0.75
Impulsive Disorders	50 (24.8%)	9 (13.8%)	0.03
Other	4 (2.0%)	2 (3.1%)	0.6
Psychotic Disorders	5 (2.5%)	4 (6.1%)	0.25
Substance Use (primary)	0 (0.0%)	0 (0.0%)	1
(Any)*	13 (6.4%)	13 (20%)	0.01
Psychiatric Symptoms, N (%)			
Aggression/Agitation	82 (40.6%)	15 (23.1%)	0.008
Anxiety	62 (30.7%)	17 (26.2%)	0.45
Depression	91 (45.0%)	34 (52.3%)	0.35
Homicidal Ideation	5 (2.5%)	2 (3.1%)	0.8
Mania	0 (0.0%)	2 (3.1%)	0.01
Other	1 (0.5%)	1 (1.5%)	
Psychosis	13 (6.4%)	10 (15.4%)	0.03
Self-Injurious Behavior	26 (12.9%)	12 (18.5%)	0.3
Suicidal Ideation	93 (46.7%)	28 (43.1%)	0.65
Suicide Attempt	10 (5.0%)	1 (1.5%)	0.001
Disposition, N (%)			0.02
Admit to Other Service	2 (1.0%)	0 (0.0%)	
Inpatient	64 (31.7%)	33 (50.8%)	
Outpatient Referral	136 (67.3%)	32 (49.2%)	

* Any Substance Use Diagnosis (SUD) (primary, secondary, tertiary, etc.) is reported to reflect degree of SUD comorbidity.

presentations at WMC Health during the height of the pandemic, which was primarily accounted for by a disproportionate decline among C/A patients. Reports from Germany, France, Spain, and Canada have reported similar declines in psychiatric emergency services volume, however, clinical and detailed demographic information were minimal and do not separately address the C/A population (Hoyer et al., 2020; Kolar, 2020; Pham-Scottet et al., 2020; Arango, 2020). The decline seen in our cohort paralleled that in the general emergency department (despite a large influx of medically ill COVID-19 patients), however the relative drop in C/A patients presenting for psychiatric emergencies was the largest among all subgroups investigated. While speculative this phenomenon may be explained by several factors. First, parents/guardians might have been reluctant to bring C/A patients for EPE due to fear of contracting COVID-19 in the ED. Second, schools, mental health clinics and group homes, which constitute the primary referral and treatment sources, were closing down because of quarantine orders. This potentially diminished both school-based psychosocial triggers (i. e., bullying) for C/A emergencies as well as outpatient clinic and school-based identification, referral and treatment of C/A in need of emergency services.

Importantly, there were specific disorders and symptoms that most commonly accounted for psychiatric emergency presentations independent of pre-COVID or COVID periods. For C/A and adults, depressive disorders and suicidal ideation were the most common psychiatric emergency presentations. In addition, adjustment and impulse control disorders and symptoms of anxiety were also common among C/A patients, while bipolar and psychotic spectrum disorders were also common among adults. Substance use comorbidity was present in nearly half of adults studied. Taken with the fact that a high percentage of C/A (>50%) and nearly 90% of adults had a prior psychiatric history, regardless of COVID period, these data suggest that patients with prior psychiatric illness and SUD comorbidity are always at risk for psychiatric emergencies. COVID-19 may have constituted one of multiple psychosocial stressors for such patients, but our data suggest that COVID-19 was a primary precipitant in 25% of them (see Table 5).

Table 3
Comparison of Pre-COVID (January 1-February 28, 2020) and COVID (March 1-April 30, 2020) *Adult* patient characteristics.

Patient Characteristic	Pre-COVID period	COVID period	Sig. (p, 95%)
Number of patients	153	136	
Age (mean)	39.7 (SD = 17.7)	37.1 (SD = 17)	0.2
Gender, N (%)			0.35
Female	59 (38.6%)	62 (45.6%)	
Male	91 (59.5%)	73 (53.7%)	
Other	3 (2.0%)	1 (0.7%)	
Ethnicity, N (%)			0.4
White	60 (39.2%)	59 (43.4%)	
African American	55 (35.9%)	41 (30.1%)	
Hispanic	23 (15.0%)	25 (18.4%)	
Other	15 (9.8%)	9 (6.6%)	
Relationship, N (%)			0.03
Single	119 (77.8%)	85 (62.5%)	
Relationship	14 (9.2%)	18 (13.2%)	
Married	10 (6.5%)	21 (15.4%)	
Separated/Divorced	10 (6.5%)	12 (8.8%)	
Living situation, N (%)			0.85
Homeless	28 (18.3%)	22 (16.2%)	
Home/Apartment	89 (58.2%)	86 (63.2%)	
Group/Nursing Home	30 (19.6%)	24 (17.6%)	
Unknown	6 (3.9%)	4 (2.9%)	
Employment, N (%)			0.03
Employed, full-time	17 (11.1%)	16 (11.8%)	
Employed, part-time	10 (6.5%)	2 (1.5%)	
Unemployed, new	11 (7.2%)	13 (9.6%)	
Unemployed, chronic	65 (42.5%)	73 (53.7%)	
Student	38 (24.8%)	18 (13.2%)	
Unknown	12 (7.8%)	14 (10.3%)	
Prior Psychiatric History, N (%)			0.6
Yes	136 (88.9%)	118 (86.8%)	
No	17 (11.1%)	18 (13.2%)	
Current Outpatient Care, N (%)			0.03
Yes, able to contact	104 (68.0%)	86 (63.2%)	
Yes, unable to contact	6 (3.9%)	11 (8.1%)	
No	19 (12.4%)	28 (20.6%)	
Unknown	24 (15.7%)	11 (8.1%)	
Legal History, N (%)			0.08
Yes, pending charges	8 (5.2%)	3 (2.2%)	
Yes, recent incarceration	10 (6.5%)	6 (4.4%)	
Yes, other	12 (7.8%)	22 (16.2%)	
No	123 (80.4%)	105 (77.2%)	

In the analysis of C/A patients comparing the pre-COVID-19 to COVID-19 periods, there was little difference in socio-demographic characteristics between the two groups, with the exception that a higher percentage of C/A patients who had no prior psychiatric history presented for EPE during the COVID-19 period, suggesting greater onset of emergency mental health issues in this age group. A supplementary analysis comparing the 73 C/A patients with new-onset disorders from pre-COVID-19 vs. COVID-19 period, indicated no difference in types of new disorders observed, indicating risk of new onset across all levels of pathology. During the COVID-19 period, there were proportionately fewer C/A patients with Impulse Control Disorders and symptoms of agitation and aggression, which may reflect the diminished school-based psychosocial triggers to “acting out” aggressive behaviors, including bullying, interpersonal confrontations and limit-setting. Further, while C/A patients seen for EPE had similar rates of depression, suicidal ideation and self-injurious behaviors in the pre-COVID-19 compared to the COVID-19 periods, C/A patients presented with fewer actual suicide attempts during the COVID-19-period. This may similarly reflect the decrease in triggers for aggressive behaviors, in this instance towards oneself in the form of suicidal acts. In addition, while no C/A patients had a primary SUD, the data did indicate a significant increase in proportion of C/A patients during the COVID-19 period with comorbid SUD, suggesting an increased propensity to self-medicate distress with

Table 4
Comparison of Pre-COVID (January 1-February 28, 2020) and COVID (March 1-April 30, 2020) *Adult* consultation patient outcomes.

Patient Characteristic	Pre-COVID period	COVID period	Sig. (p, 95%)
Number	153	136	
Percentage of all consults	43.1%	67.7%	<0.001
Primary Psychiatric Diagnosis, N (%)			
Adjustment Disorder	26 (17.0%)	21 (15.4%)	0.7
Anxiety Disorders	4 (2.6%)	12 (8.9%)	0.01
Bipolar Disorders	28 (18.3%)	23 (16.9%)	0.75
Depressive Disorders	35 (22.9%)	34 (25.0%)	0.7
Impulsive Disorders	4 (2.6%)	3 (2.2%)	0.8
Psychotic Disorders	49 (32.0%)	45 (33.1%)	0.85
Other	3 (2.0%)	5 (3.7%)	0.4
Substance Use (Primary) (Any)	10 (6.5%)	7 (5.5%)	0.6
Psychiatric Symptoms, any, N (%)			
Aggression/Agitation	39 (25.5%)	23 (16.9%)	0.05
Anxiety	36 (23.5%)	40 (29.4%)	0.4
Depression	69 (45.1%)	63 (46.3%)	0.9
Homicidal Ideation	3 (2.0%)	7 (5.1%)	0.2
Mania	9 (5.9%)	11 (8.1%)	0.5
Other	0 (0.0%)	7 (5.1%)	
Psychosis	53 (34.6%)	48 (35.3%)	0.9
Self-Injurious Behavior	17 (11.1%)	12 (8.8%)	0.45
Suicidal Ideation	61 (41.8%)	60 (44.1%)	0.7
Suicide Attempt	6 (3.9%)	7 (5.1%)	0.7
Disposition, N (%)			0.04
Admission to Other Service	6 (3.9%)	8 (5.8%)	
Psychiatric Admission	81 (52.9%)	90 (66.2%)	
Outpatient referral	66 (43.1%)	38 (27.9%)	

Table 5
Analysis of COVID-19 related stressors in *Child/Adolescent* and *Adult* patients seen during the COVID period (March 1-April 30, 2020).

COVID-19 Stressor	Adolescent (N = 30)	Adult (N = 74)	Sig. (p, 95%)
Any COVID-19 Stressor, N (%)	15 (23.1%)	37 (27.2%)	0.5
Moderate Stressor, N (%)	11 (16.9%)	23 (16.9%)	0.99
Severe Stressor, N (%)	4 (6.2%)	14 (10.3%)	0.35
Type of Stressor, N (%)			
COVID Positive	0 (0.0%)	2 (5.4%)	0.3
COVID Positive Family Member	0 (0.0%)	1 (2.7%)	0.5
COVID-related death	0 (0.0%)	4 (10.8%)	0.15
Gen. anxiety re: Pandemic	6 (40.0%)	10 (27.0%)	0.65
Worried about COVID -family	0 (0.0%)	4 (10.8%)	0.15
Worried about COVID- self	7 (46.7%)	15 (40.5%)	0.95
COVID-related delusion	0 (0.0%)	3 (8.1%)	0.2
Quarantine/Isolation	7 (46.7%)	18 (48.6%)	0.6
Unemployment	0 (0.0%)	4 (10.8%)	0.15
Financial strain	0 (0.0%)	4 (10.8%)	0.15

substances during the COVID-19 period. Finally, the significant increase in the proportion of C/A patients during the COVID-19 period who were admitted for inpatient psychiatric treatment may reflect the fact that patients who did come for evaluation had proportionately more severe pathology, requiring the highest level of care for safety and stabilization.

In contrast to children and adolescents, the numbers of adults seen for EPE did not differ significantly from the pre-COVID-19 to the COVID-19 period. During the COVID-19 period, there were significantly more adults who were in relationships, who were unemployed and who did not have or could not access outpatient care. None of these are surprising, especially because COVID-19 related stressors included concerns about COVID-19 risk or actual COVID-19 infection in family, as well as unemployment and economic strain. Further, lack of outpatient care likely predisposed individuals to requiring emergency mental health care, considering many outpatient clinics and partial hospitalization programs were not taking new patients, and psychiatrists and

A 40-year-old African American man with bipolar disorder attempted to set a fire in order to “disinfect” his group home from the virus.

A 22-year-old Hispanic man with no psychiatric history believed he was responsible for the pandemic and could control the USA President’s response to the pandemic.

A 33-year-old Caucasian man with no psychiatric history was obsessively preoccupied with COVID-19, not sleeping, refractory to reassurance, demanding to be tested repeatedly, feeling others were lying and out to get him.

Fig. 2. Clinical Examples of Psychosis from fear of COVID-19.

Table 6

Comparison of *Adult* psychiatric consultation patients seen in the ED between March 1-April 30, 2020 who were tested and found to be COVID-19 positive compared to those who were found to be COVID-19 negative - characteristics.

Patient Characteristic	COVID-19 positive	COVID-19 negative	Sig. (p, 95%)
Number of patients	18	57	
Age (mean)	38.2 (SD = 19)	44.8 (SD = 17)	0.15
Gender, N (%)			0.6
Female	9 (50.0%)	22 (38.6%)	
Male	9 (50.0%)	34 (59.6%)	
Other	0 (0.0%)	1 (1.8%)	
Ethnicity, N (%)			0.02
White	4 (22%)	32 (49%)	
African American	10 (56%)	15 (26%)	
Hispanic	4 (22%)	8 (14%)	
Asian	2 (11%)	0 (0.0%)	
Relationship, N (%)			0.8
Single	12 (66.7%)	35 (61.4%)	
Relationship	2 (11.1%)	4 (7.0%)	
Married	2 (11.1%)	12 (21.1%)	
Separated/Divorced	2 (11.1%)	6 (10.5%)	
Living situation, N (%)			0.25
Group/Nursing Home	4 (22.2%)	4 (7.0%)	
Home/Apartment	10 (55.6%)	38 (66.7%)	
Homeless	4 (22.2%)	12 (21.1%)	
Unknown	0 (0.0%)	3 (5.3%)	
Employment, N (%)			0.03
Employed, full-time	1 (5.6%)	7 (12.3%)	
Employed, part-time	0 (0.0%)	1 (1.8%)	
Student	4 (22.2%)	1 (1.8%)	
Unemployed, chronic	11 (61.1%)	33 (57.9%)	
Unemployed, new	2 (11.1%)	7 (12.3%)	
Unknown	0 (0.0%)	8 (14.0%)	
Prior Psychiatric History, N (%)			0.45
Yes	14 (77.8%)	49 (86.0%)	
No	4 (22.2%)	8 (14.0%)	
Current Outpatient Care, N (%)			0.3
No	11 (19.3%)	4 (22.2%)	
Unknown	7 (12.3%)	1 (5.6%)	
Yes, able to contact	31 (54.4%)	13 (72.2%)	
Yes, unable to contact	8 (14.0%)	0 (0.0%)	
Legal History, N (%)			0.55
No	13 (72.2%)	45 (78.9%)	
Yes, other	4 (22.2%)	9 (15.8%)	
Yes, pending Charges	0 (0.0%)	3 (5.3%)	
Yes, incarceration	1 (5.6%)	0 (0.0%)	

other mental health providers who were continuing to see patients were forced to transition to telemedicine appointments, regardless of their prior experience with the format or technology.

Adults seen for EPE during the COVID-19 period were more likely than their pre-COVID-19 counterparts to have an anxiety disorder, including generalized anxiety, panic and PTSD. Higher rates of anxiety, particularly acute and post-traumatic stress, have been anticipated and reported in survey samples during the COVID-19 pandemic, but not yet documented in clinical samples (Nelson et al., 2020; Tang et al., 2020). As with C/A patients, a higher percentage of adult patients seen during the COVID-19 period warranted inpatient psychiatric admission,

Table 7

Comparison of *Adult* psychiatric consultation patients seen in the ED between March 1-April 30, 2020 who were tested and found to be COVID-19 positive compared to those who were found to be COVID-19 negative - outcomes.

Patient Characteristic	COVID-19 positive (N = 18)	COVID-19 negative (N = 57)	Sig. (p, 95%)
Psychiatric Diagnosis, N (%)			
Adjustment Disorder	1 (5.6%)	7 (12.3%)	0.7
Anxiety Disorders	3 (16.7%)	6 (10.5%)	0.45
Bipolar Disorders	3 (16.7%)	13 (22.8%)	0.75
Depressive Disorders	0 (0.0%)	17 (29.8%)	0.008
Impulsive Disorders	1 (5.6%)	0 (0.0%)	0.25
Psychotic Disorders	10 (55.6%)	17 (29.8%)	0.05
Other	1 (5.6%)	1 (1.8%)	0.06
Personality Disorders	0 (0.0%)	2 (3.5%)	0.9
Substance Use (primary)	2 (11.1%)	1 (1.8%)	0.15
(Any)			
Psychiatric Symptoms, N (%)			
Aggression/Agitation	5 (27.8%)	8 (14.0%)	0.2
Anxiety	2 (11.1%)	20 (35.1%)	0.07
Depression	6 (33.3%)	28 (49.1%)	0.25
Homicidal Ideation	2 (11.1%)	3 (5.3%)	0.6
Mania	2 (11.1%)	6 (10.5%)	0.9
Other	2 (11.1%)	1 (1.8%)	0.07
Psychosis	12 (66.7%)	20 (35.1%)	0.02
Self-Injurious Behavior	1 (5.6%)	6 (10.5%)	0.9
Suicidal Ideation	3 (16.7%)	31 (54.4%)	0.006
Suicide Attempt	0 (0.0%)	3 (5.3%)	0.9
Disposition, N (%)			0.2
Admit to medical service	3 (16.7%)	3 (5.3%)	
Psychiatric Admission	12 (66.7%)	48 (84.2%)	
Outpatient Referral	3 (16.7%)	6 (10.5%)	

regardless of diagnosis. This may reflect greater illness severity during COVID-19, lack of outpatient access and the tendency to come to the ED during the pandemic when it was clearly warranted.

During the two-month period of COVID-19, higher rates of self-injury, suicidal ideation or suicide attempts were not observed in this adult ED sample compared to the pre-COVID period. However, this investigation was unable to account for death by suicides, and the window of observation may have been too narrow to detect an increase in suicidal ideation or attempts. It has been speculated that increased rates of suicide would be observed in the wake of the pandemic and McIntyre projected a 5–28% increase in suicide rates in Canada during 2020–2021 based on a predictive model utilizing moderate to severe levels of unemployment associated with COVID-19 as a major suicide determinant (Sher, 2020;Mcintyre and Lee, 2020). Interestingly, according to the Commissioner of the Department of Community Mental Health in Westchester County, Michael Orth, Westchester County recorded a concurrent decrease in completed suicides during the months of March and April 2020, however, a higher than average number of completed suicides occurred in May through July of 2020, which was outside of this study window. It remains to be seen if an upward trend in suicide will be observed with the protracted stress of the COVID-19 pandemic.

The study was able to shed some light on COVID-19 stressors as they related to the psychiatric emergencies during this period. A baseline assumption was that some level of COVID-19 related concerns were prevalent throughout the community, as infection and death rates rose, and shutdown orders were imposed. We endeavored to identify the nature and severity of those that were directly related to the psychiatric emergency. Regardless of age, approximately 25% of patients had a COVID-19-related concern that was central to their presentation. In nearly half of these patients, the most common concerns were fear of infection in oneself and coping with the isolation associated with quarantine. This is consistent with non-clinical US national survey data collected during the same time period (Nelson et al., 2020). Four adults presented with acute grief reactions from the loss of a spouse or parent to COVID-19, painfully compounded by their inability to visit in the last hours of their loved one's life because of hospital infection control protocols. Adults, but not children and adolescents, evidenced concern over having *confirmed* COVID-19 infection themselves or in a family member, as well as distress related to job loss and finances. The most severe COVID-19 stressors related to fear of or actual COVID-19 infection in self and others. Three COVID-19-negative patients presented with delusions related to COVID-19 (Fig. 2).

Because of the availability of rapid COVID-19 testing, the investigators were able to compare a subset of patients who tested positive for COVID-19 to a subset who tested negative. These patients were asymptomatic or had mild symptoms of COVID-19, normal vital signs and laboratory values. Approximately 75% of those tested were being screened for COVID-19 pending psychiatric admission, and the rest for COVID-19 exposure and/or new onset disorders where COVID-19 was in the differential diagnosis. Eighteen (24%) of 75 patients tested were COVID-19 positive, 15 (83%) of whom were admitted to hospital. Thereafter, they were admitted to a specialized COVID-19 psychiatric unit in the Behavioral Health Center. Very noteworthy patterns emerged in these populations. First, as is characteristic of the pandemic in general, African American and Hispanic patients were significantly over-represented in the COVID-19 infected group. Further, the COVID-19 positive patients were significantly more likely to have a psychotic disorder and to present with psychotic symptoms (67% of COVID-19 positive patients) compared to COVID-19 negative patients (35%), who were more likely to have depression and suicidal ideation. Among the COVID-19 positive patients with psychosis, 65% had either bipolar disorder, schizoaffective disorder or schizophrenia and one third had new onset psychotic disorders. Schizophrenia researchers posited a potential association between COVID-19 infection and psychosis in 1–4% of COVID-19 patients, including new-onset psychosis. Potential etiologies include pandemic-related stressors, central nervous system inflammatory response, treatment with corticosteroids and underlying biological vulnerability to psychosis (Brown et al., 2020). This group and others described new onset psychotic symptoms in COVID-19 patients, citing neuro-inflammation, encephalopathy, delirium, severe stress and anxiety, underlying predisposition and other factors (Varatharaj et al., 2020; Ferrando et al., 2020; Parra et al., 2020). These data support further research into the etiology of psychosis in the setting of COVID-19 infection. The comparatively low rate of depression and suicidal ideation in the patients infected with COVID-19 was unexpected, and may have been related to the cross-sectional nature of the data and the fact that underlying affective symptoms may have been “drowned out” by the overwhelming number of patients with psychosis in the COVID-19 positive group.

4.1. Study limitations

This study describes psychiatric emergencies in an academic Medical Center emergency department during the height of the COVID-19 pandemic in suburban New York City. The study is limited in several aspects. It is limited in its geographic scope, its retrospective, cross-sectional and time-limited nature, and does not include

medically hospitalized patients with severe COVID-19 infection. The number of C/A patients seen in the COVID-19 period is small and the reasons for decline in C/A volume are speculative, based on our anecdotal experience as well as parent and provider commentary in the Westchester community. Not all patients were tested for COVID-19, due to both testing limitations and lack of associated COVID-19 symptoms that would warrant testing. It is quite possible that there were EPE patients during the COVID-19 period who were COVID-19 positive, were not tested and were discharged to the community. In hindsight, given the high rate of COVID-19 positive status in those EPE patients tested, one could argue for COVID-19 testing in all patients presenting with psychiatric emergencies during the pandemic.

5. Conclusion

Despite the limitations cited, this study reveals important patterns in the volume, nature and stressors associated with psychiatric emergencies during an unprecedented global pandemic. While psychiatric emergency volume declined, particularly children and adolescents, during the COVID-19 period, depression, suicidal ideation, psychotic disorders and substance use disorder comorbidity were prevalent in all age groups, regardless of the period in which they presented. Importantly, no increase in suicidal ideation or attempts was observed during COVID-19, but the study could not address the issue of completed suicides. The data indicated that, during the COVID-19 period, heightened rates of anxiety in the adult group, new and more severe psychopathology, such as increased psychosis and substance use in the C/A group, decreased access to outpatient care for adults, and increased psychiatric hospitalization rates in all age groups may be important considerations during the pandemic. Importantly, COVID-19-related stress was central in one out of four EPE patients, including significant personal loss to COVID-19, COVID-19 infection itself, worry about infection and the effects of the shutdown, such as social isolation, job and economic concerns. COVID-19 infection itself is an important consideration in psychiatric emergency patients and appears to be associated with psychosis, potentially related to viral infection, psychological and other biological factors, warranting further study.

Enhanced mental health services will be critically important to address the mental health consequences of this ongoing pandemic and prevent an upsurge in psychiatric emergencies. As an example, WMC Health, which had an established tele-mental health program prior to the pandemic, expanded these services at all levels of care, including outpatient, partial hospitalization, emergency and consultation-liaison services. Once established, outpatient volume actually increased in April through June of 2020. In addition, a COVID-19 distress hotline, staffed by WMC Health clinicians 24 h/7 days, was established to provide crisis counseling and referral to tele-mental health outpatient services to front-line health care workers and the community. Over 200 unique individuals have been served to date, most of whom benefitted from the immediate support and approximately 30% have been referred for outpatient care. Inevitably, specific psychotherapeutic interventions, including on-line therapies, should be developed to target pandemic-related stresses, such as the acute and chronic consequences of COVID-19 infection itself, fear of infection, isolation, and grief. Finally, rapid COVID-19 testing should be available to all patients presenting to psychiatric emergencies and specialized inpatient protocols and programs must be established to safely care for psychiatric patients with COVID-19 infection.

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Declaration of competing interest

No conflict of interest exists.

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