

COVID-19 Pandemic's Effect on Children and Catatonia: Analysis of an Inpatient Pediatric Unit and Consultation-Liaison Psychiatry Service

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Introduction

Catatonia is a neuropsychiatric syndrome marked by abnormal movements, behaviors, and withdrawal, often secondary to psychiatric and/or medical conditions. It can present in various forms, including excited, akinetic, and malignant catatonia, featuring symptoms such as stupor, mutism, waxy flexibility, and potentially life-threatening autonomic dysfunction in malignant cases.¹ Pediatric catatonia is diagnosed less often than in adults. Timely diagnosis and treatment is critical as pediatric catatonia is associated with significant morbidity and a 60-fold higher risk of death than the general population².

It is well-established that the COVID-19 pandemic has had a profound impact on pediatric mental health. Data has shown that youth suicide attempts increased significantly during the early pandemic years 2020-2021, then decreased back to baseline in the 2022.^{3,4} Moreover, isolation measures introduced various stressors for households, which may have hindered parents' ability to provide adequate care. These stressors include job loss, divorce, parental depression, familial illness or death, and substance use, potentially leading to unintentional child neglect.⁵

At LUMC, a large academic medical center, the Consult-Liaison Psychiatry (CLP) service has observed an increase in hospitalizations for pediatric catatonia during the pandemic years of 2021 and 2023. While some reports suggest that COVID-19 has caused late-onset catatonia in adults, research examining this phenomenon in children and adolescents remains scarce.⁶ This study was designed to provide quantitative data on pediatric catatonia admissions across the pandemic.

Objectives

This study aims to investigate the objective trends of catatonia hospitalizations compared to suicidality (ideation and attempt by intentional overdose) throughout the COVID-19 pandemic by observing three different phases. Additionally, this study examines risk factors that contributed to the development of catatonia.

Methods

This study was approved by the Loyola University Medical Center Institutional Review Board. This retrospective analysis used ICD-9 coding to identify pediatric catatonia patients. Data on suicide attempt encounters was gathered from previous studies at LUMC that quantified suicidality during from March 2019 to December 2022. Additional suicide attempts were manually collected from available Consult-Liaison lists spanning January 2023-February 2024. Patients who had more than one admission were counted as separate admissions. All catatonia encounters were categorized into three phases based on their hospitalization admission date:

1. Pre-pandemic phase - March 2017 to February 2020
2. Acute-pandemic phase - March 2020 to February 2021
3. Chronic-pandemic phase - March 2021 to December 2023

For catatonia patients, a thorough chart review was conducted to collect patient demographic data, medical history, psychiatric history, COVID-19 infection status, and biomarkers (WBC, CRP, D-dimer CK). All patients were screened for documented neglect. A retrospective neglect questionnaire, childhood adversity, and family-related data were collected as well.

Results

Phase	Date	Catatonia admissions	Age range	Gender	% change	Psych history	Suicidality/self-harm	Neglect	Adversity	Abuse
Pre-pandemic	3/2017 – 2/2020	2	15	F=2	--	2	2	0	0	0
Acute-pandemic	3/2020 – 2/2021	5	15-17	F=1, M=3	+250%	5	2	1	4	1
Chronic-pandemic	3/2021 – 12/2023	12	6-18	F=6, M=6	+240%	8	6	2	10	5

Table 1. Pediatric catatonia admissions at LUMC from 3/2017 to 12/2023. No statistical significance difference found across all three phases.

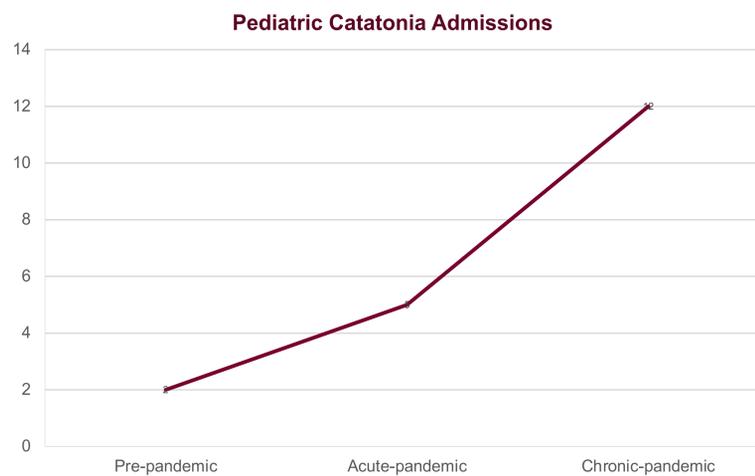


Figure 1. Trends in catatonia admissions from 3/2017 to 12/2023.

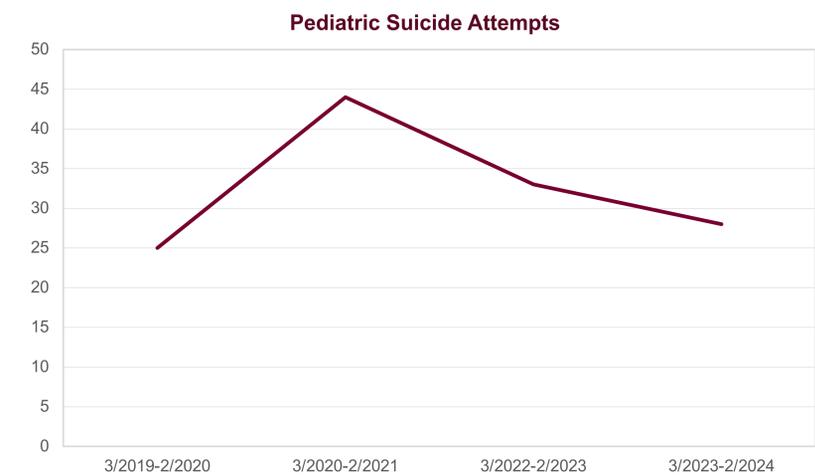


Figure 2. Trends in suicide attempt from 3/2019 to 2/2024. (p=0.0002)

A total of 19 catatonia admissions were identified from 3/2017 to 12/2023. Pre-pandemic had 2 female patients aged 15. Acute-pandemic had 5 with 1 female and 3 males ages 15-17 (250% increase). Chronic-pandemic had 12 patients with 6 females and 6 males ages 6-18 (240% increase). The median age for across all phases was 16. 9 admissions were transferred from an inpatient psychiatry facility and 2 were transferred from another hospital. All patients in the pre-pandemic and acute-pandemic had a documented psych history (mood disorder, psychosis), while 67% of chronic-pandemic patients had a psych history. The percentage of patients who had documented suicidal ideation or self-harming behaviors was 100% in pre-pandemic, 40% in acute-pandemic, and 50% in chronic-pandemic. 20% of patients in the acute-pandemic and 17% in chronic-pandemic had documented neglect. The percentage of patients with adverse childhood experiences was 80% in the acute-pandemic, with 20% of those patients with a history of abuse (sexual and violent), and 83% in the chronic-pandemic, with 50% of those with a history of abuse.

For suicide attempts, there were 25 admissions from 3/2019 to 2/2020 in the pre-pandemic phase, 44 in the acute-pandemic from 3/2020 to 2/2021, and 33 in the chronic-pandemic 3/2021 to 2/2022 (75% decrease) and 28 from 3/2022 to 2/2024 (15% decrease) (p=0.0002).

All catatonia patients had WBC drawn. Average WBC was 6.8 in pre-pandemic, 8.64 in acute-pandemic, and 11.29 in chronic-pandemic (p=0.26). Average CK was 137 in pre-pandemic, 134.25 in acute-pandemic, and 1070.27 in chronic-pandemic (p=0.22). In acute-pandemic, 1 patient tested positive for COVID-19 on admission while 2 patients tested positive during the chronic-pandemic phase.

Conclusion

The acute phase was associated with an increase in suicidality, likely contributed by social isolation. During the chronic phase, suicide attempts decreased due to improved social interaction, a trend supported by 2023 CDC data^{4,7}. However, at LUMC, catatonia admissions increased drastically independent of COVID-19 infection. Adversity may have played a role as the fraction of adversity increased from 0% to 80% and 83% during the acute- and chronic-pandemic. All catatonia patients in the pre- and acute-pandemic phases had a notable psych history. However, 33% of chronic-pandemic patients developed catatonia in the absence of a psychiatric history. These findings suggest that pandemic stressors may have had a profound, delayed effect on adolescents. More studies are required to observe similar trends in other centers. No catatonia-related findings were statistically significant due to small sample sizes. Moreover, completing a neglect questionnaire retrospectively based on patient charts proved to be challenging as many items were unable to be found. It is therefore unclear whether neglect had a role in LUMC patients developing catatonia.

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