Mental Health of Youth with Medical Complexity:
Healthcare Utilization and the Impact of the COVID-19 Pandemic

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INTRODUCTION

- In 2020, 23% of parents nationally reported their child had a history of at least one mental disorder.[1]

- Children living with physical disorders may be more likely to be impacted by mental disorders.[2,3]

- Youth mental health has been exacerbated by the COVID-19 pandemic, and in December 2021 was deemed by the U.S. Surgeon General an "urgent public health issue" that needs "immediate awareness and action".[4]

- The overall objective of this study was to examine the relationship of mental disorders and medical complexity both independently and within the context of the COVID-19 pandemic.

METHODS

- Sample included patients from the Children's Specialty Center (CSC) clinics at the University of Vermont Medical Center aged 6-17 that were eligible for insurance in 2020, using Vermont's all-payer claims database; Vermont Health Care Uniform Reporting and Evaluation System (VHCURES).

  - *The analyses, conclusions, and recommendations from VHCURES data are solely those of the study authors and are not necessarily those of the Green Mountain Care Board (GMCB). The GMCB had no input into the study design, implementation, or interpretation of the findings.*

- Associations between patient medical complexity and 1) having an affected mental health body system, and 2) having a mental disorder diagnosis. We also assessed changes to patient mental disorder diagnoses during the COVID-19 pandemic.

- Medical complexity defined by the Pediatric Medical Complexity Algorithm (Non-Chronic, Non-Complex Chronic, and Complex-Chronic)[5]

- Chi-square and multiple logistic regression analyses conducted in Stata version 17.0.[6]

Table 1

Sample Categorization by Age, Sex, Insurance, and Rurality

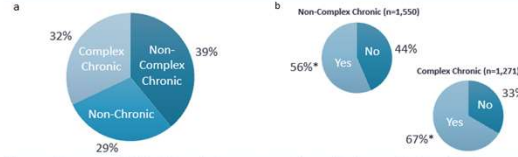|	Total Sample	
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Full Sample	3,963	100%
Age Group (Years)		
6-8	907	23%
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Rural	2,151	54%
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RESULTS

Figure 1. a) Percentage of Children's Specialty Center patients within each Pediatric Medical Complexity Category in 2020. b) Percent of non-complex and complex chronic patients with a mental health body system affected in 2020. * Percent of patients with a mental health body system diagnosis is significantly higher for complex chronic patients when compared to non-complex chronic patients, P < 0.001, using a Chi-squared statistical test.
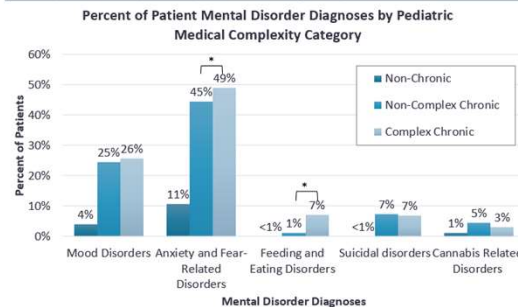

Figure 2. Percent of the Children's Specialty Center Patients Aged 6-17 Years Old Within Each Pediatric Medical Complexity Category with Certain Mental Disorder Diagnoses Any Time During the Years 2018-2020 * Percent with mental disorder diagnosis is significantly higher for complex chronic patients when compared to non complex chronic patients, P < 0.05, using Chi squared statistical tests.
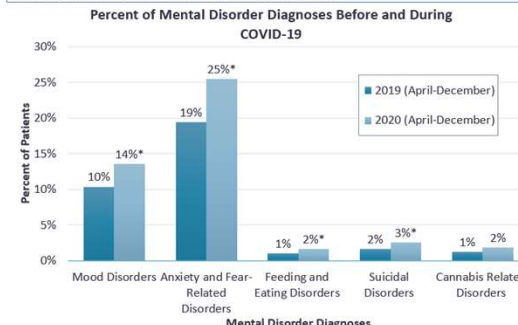

Figure 3. Percent of the Children's Specialty Center Patients Aged 6-17 Years Old with Certain Mental Disorder Diagnoses Within April-December of 2019 and 2020. * Percent of patients with mental disorder diagnoses in significantly higher in 2020 when compared to 2019, p<0.05 using Chi-squared statistical tests.

- The odds of having an affected mental health body system was 45% greater for patients with complex chronic disease compared to patients with non-complex chronic disease, controlling for confounders (p<0.001).

- The odds of having an eating disorder diagnosis was higher while the odds of having a cannabis use disorder was lower among patients with complex chronic disease, compared to patients with non-complex chronic disease, controlling for confounders (ps<0.004).

- During COVID-19, more patients had mental disorder diagnoses (mood, anxiety, suicidal and eating) than before (ps<0.05).

DISCUSSION

- Associations between higher medical complexity and mental disorders suggests that patients with higher medical complexity may need greater access to mental health services and more mental disorder screenings than others.

- The increase in mental disorder diagnoses during COVID-19 suggests a need for greater attention to be paid to mental wellbeing within Children's Specialty Center patients.

- Limitations included the breadth of mental disorder diagnoses explored, and lack of information for both socioeconomic status and disease complexity from insurance claim derived data.

FUTURE DIRECTIONS

- Future analysis within the Children's Specialty Center patient population should include:

  - investigating more families of mental disorder diagnoses.

  - Incorporating data from the year 2021 to assess the impact of the continuing COVID-19 pandemic.

- Incorporating this research into quality improvement projects that are a part of direct patient care

REFERENCES/ACKNOWLEDGEMENTS

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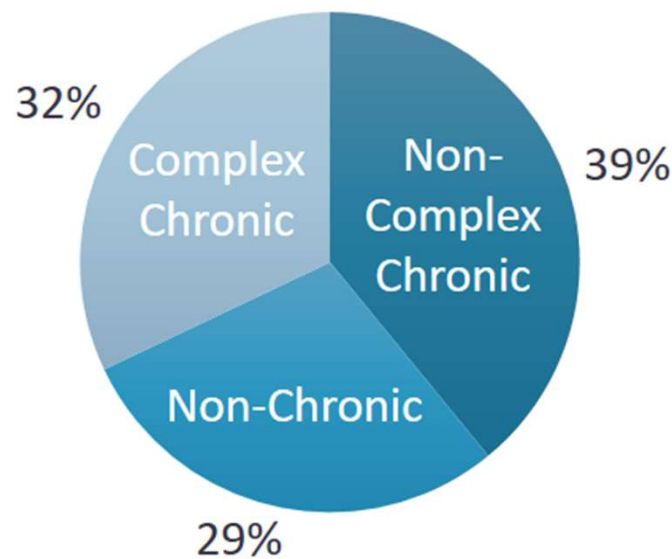*Sample Categorization by Age, Sex, Insurance, and Rurality*

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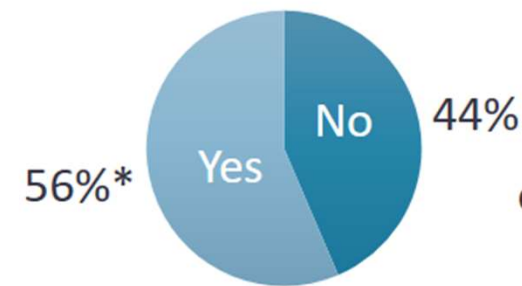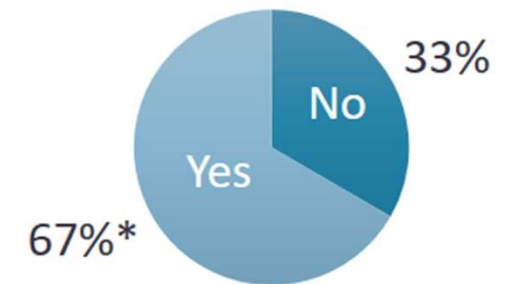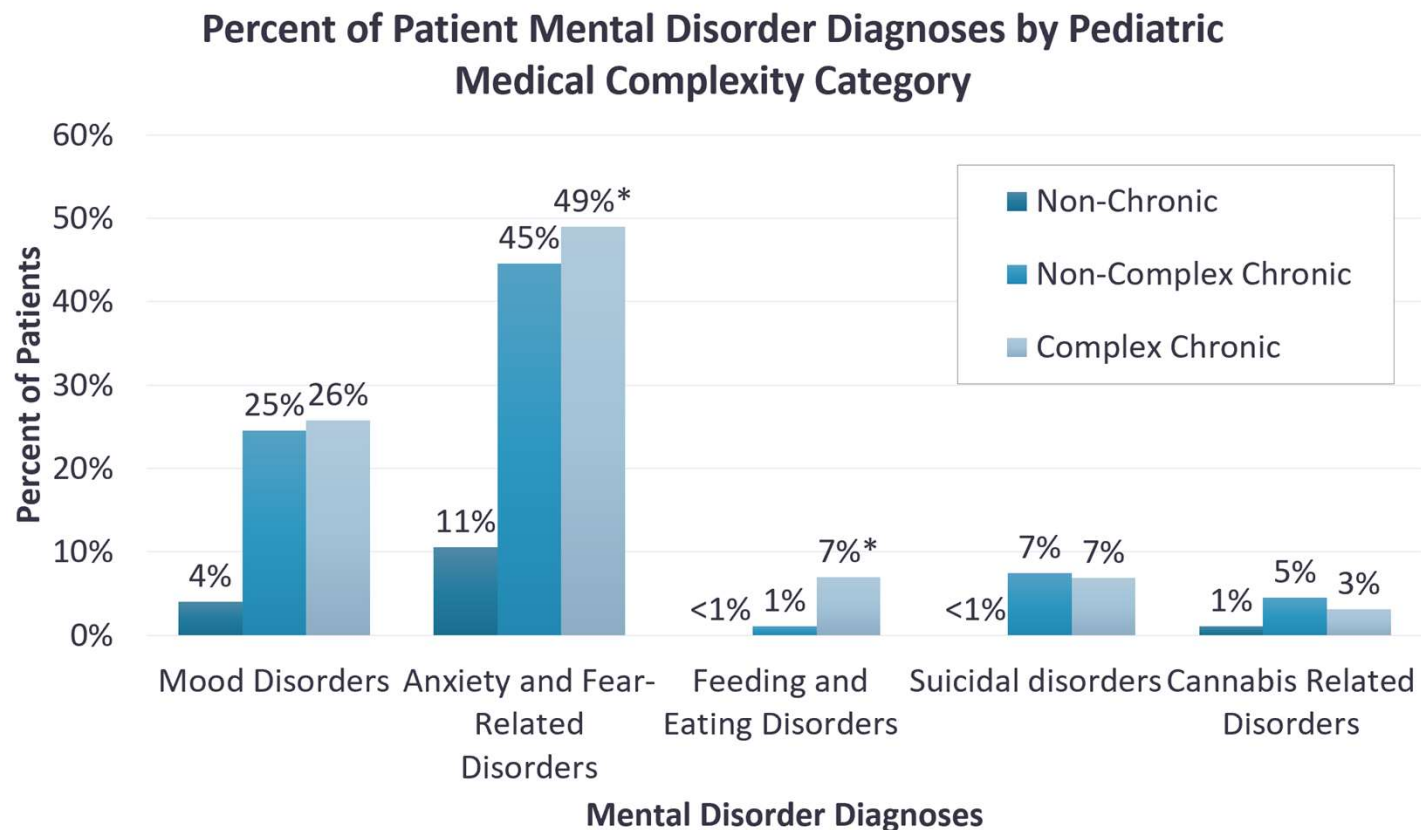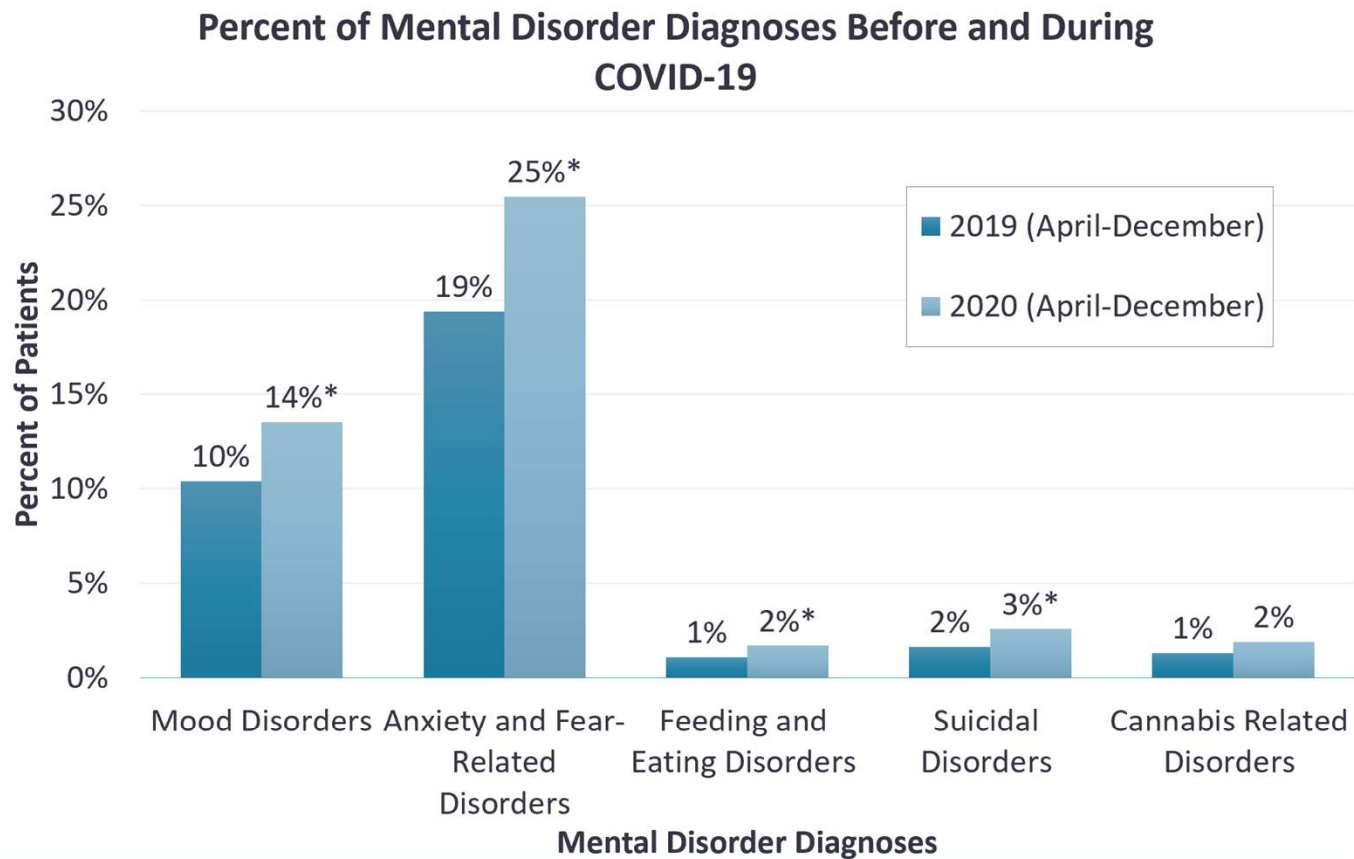
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Figure 1. a) Percentage of Children's Specialty Center patients within each Pediatric Medical Complexity Category in 2020. b) Percent of non-complex and complex chronic patients with a mental health body system affected in 2020. * Percent of patients with a mental health body system diagnosis is significantly higher for complex chronic patients when compared to non-complex chronic patients, P < 0.001, using a Chi-squared statistical test.

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Percent of Patient Mental Disorder Diagnoses by Pediatric Medical Complexity Category

Figure 2. Percent of the Children's Specialty Center Patients Aged 6-17 Years Old Within Each Pediatric Medical Complexity Category with Certain Mental Disorder Diagnoses Any Time During the Years 2018-2020
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Percent of Mental Disorder Diagnoses Before and During COVID-19

Figure 3. Percent of the Children's Specialty Center Patients Aged 6-17 Years Old with Certain Mental Disorder Diagnoses Within April-December of 2019 and 2020.
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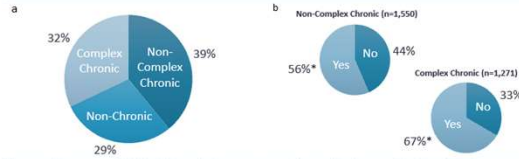|	Total Sample	
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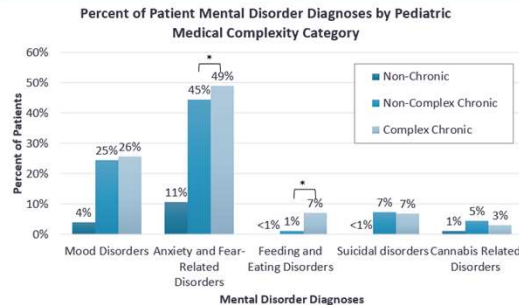

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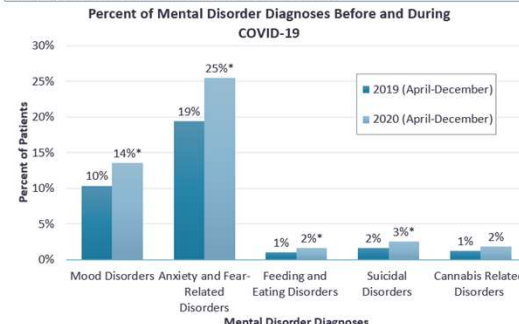

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Pediatric Medical Complexity Algorithm (PMCA)[a] categories based on clinical criteria and count of affected body systems

PMCA Category	Criteria	Number of Claims
Complex Chronic Disease[b]	Progressive Condition	≥1 Claim
	Malignancy	≥1 Claim
	Other	≥2 claims per body system for 2 different body systems during the measurement period
Non-Complex Chronic Disease		≥2 claims per body system for 1 body system during the measurement period
Without Chronic Disease		None of the above during the measurement period

a. Classification based on the more conservative version of the algorithm

b. A classification as Complex Chronic Disease can be applied if any one of these three criteria (progressive condition, malignancy, or other) are met.

c. Data table adapted from Simon TD, Cawthon ML, Stanford S, et al. Pediatric Medical Complexity Algorithm: A New Method to Stratify Children by Medical Complexity. Pediatrics. Jun 2014;133(6):E1647-E1654. doi:10.1542/peds.2013-3875