Impact of the COVID-19 Pandemic on Children and Adolescents Presenting With a Psychiatric Emergency

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Abstract

This mixed-methods survey study aims to describe the effects of the COVID-19 pandemic on the mental health of a sample of 571 children and adolescent seeking psychiatric emergency care. The study was conducted from July to October 2020 at a large Midwestern academic center. Among the respondents, there were significant increases in mental health symptoms attributed to the COVID-19 pandemic, including anxiety (71% of respondents), depression (66%), suicidal thoughts or behaviors (45%), and aggression (31%). There were significant differences in reported increases in symptoms by age and gender. In addition, 38% of participants reported that the pandemic led to a change or closure of their health care treatment, including mental health providers, with 22% reporting that reduced treatment access led to their emergency visit. Further research is indicated to assess other, more diverse populations, as well as the longer-term mental health impacts of the pandemic.

Keywords

COVID-19 Pandemic, Emergency Department, Suicidal Ideation, Mental Health, Pediatric Health

The COVID-19 pandemic has had widespread effects on the world's economy and public health, and while COVID-19 can significantly impact the physical health of infected patients, the consequences of the pandemic have also significantly impacted mental well-being. A recent meta-analysis of 17 COVID-19 studies found a greater prevalence of anxiety, depression, and stress in patients due to pandemic-related factors, such as isolation from loved ones, distressing media information, reduced financial income, and daily death counts.[1] Several studies have also noted increasing levels of generalized anxiety disorder and depressive symptoms among particular groups of patients, such as younger individuals, women, and those of low socioeconomic status.[1-5] In addition, patients with underlying mental health conditions have experienced worsening of their conditions during the pandemic.[6]

Children and adolescents have been particularly affected by societal changes, with evidence that younger individuals who are in social isolation or quarantine are more likely to experience stress, frustration, and suicidal ideation, and an international meta-analysis that highlighted the lasting impact of COVID-19 and past pandemics on the mental health of children and adolescents.[3,7] Although most studies have focused on either adolescents *or* children, a European study suggested that a pediatric population experienced predominance of different types of mental health effects from the COVID-19 pandemic depending on their age group.[8] The duration of quarantine, frustration, boredom, and change in social routines has been shown to increase risk for worsening psychological outcomes.[9]

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In the years prior to the COVID-19 pandemic, there was a sharp increase in emergency department visits for children with mental health disorders.[10] Although many have voiced concerns about more individuals requiring mental health care due to the pandemic, a reduction in the number of adolescent psychiatric patients presenting for emergency care early in the pandemic was observed worldwide.[11-14] It could be speculated that fear of contracting COVID-19 was keeping patients from seeking care in emergency departments, and this has raised concerns about patients not receiving the care they need.[15] Of note, while overall visits to emergency departments decreased during the pandemic, visits for mental health concerns declined to a lesser extent, proportionately, than those for other medical conditions.[16] One study found that rates of suicide ideation and suicide attempts among youth presenting to a pediatric emergency department were greater during times when COVID-19-related stressors and community responses were heightened.[17] Furthermore, widespread closures or limitations of mental health facilities and treatment centers during the pandemic greatly impacted access to care for patients.[18]

As previous studies have demonstrated the widespread mental health impacts of the pandemic and have established patterns of emergency department visits, the objective for this study was to further examine the detailed effects of the COVID-19 pandemic on children and adolescents by surveying those specifically seeking psychiatric emergency care. With this exploratory study, we sought to characterize the impact of the pandemic on specific symptoms, how experiences of children in different age groups were impacted, and whether trends would emerge over the course of the study.

Methods

Participants were patients (n = 573) ages 0 to 21 years presenting to Psychiatric Emergency Services (PES) at a large Midwestern academic medical center between July 1, 2020 and October 31, 2020, and who agreed to fill out a paper-and-pencil survey. Patients who were unable (mostly due to young age of the child) to fill out paperwork were not given a survey, but their parent/guardian was then given the option to complete the survey.

The PES study site evaluates both pediatric and adult patients, approximately 7000 patients per year. Approximately one-third of the patients seen are psychiatrically admitted. These data are generated through patient tracking, as each patient's final disposition is recorded in the electronic medical record, and reports are conducted monthly and annually. Psychiatric Emergency Services are adjacent to the medical emergency department, and the model is similar to most national PES locations in that individuals can walk in, be brought by ambulance or law enforcement, or can be referred by an outside clinic, medical practitioner, or the emergency department.

To add context, during the months of the study, public health legislation led to the following restrictions: schools were mostly providing virtual or hybrid learning, face masks were mandated in most in-person settings and they were recommended whenever someone left their home, most school-sponsored sports were canceled, and establishments such as pools, gyms, bowling alleys, and movie theaters were operating at limited capacity.

Patients arriving at PES during our enrollment period were provided with the Coronavirus Mental Health study form. The form was a 32-question survey developed to further understand how the COVID-19 pandemic affects patients' mental health. Included in the survey were some items taken from the COVID-19 Adolescent Symptom & Psychological Experience Questionnaire asking about changes in mental health treatment access, whether the COVID-19 pandemic led to increases in mental health symptoms, and what the most negative and positive aspects of the COVID-19 pandemic have been.[19] The remaining survey questions were developed internally by the study team to further assess the mental health impacts of COVID-19. The form could be filled out by either the patient or the patient's parent/guardian, and only one survey was filled out for each patient. Survey data were combined with demographic data (race, sex, insurance type, month of visit, age) from the hospital electronic medical record. Patients were given the opportunity to provide additional information in a free-text format, which was later analyzed in a qualitative fashion as described below.

All dependent variables were categorical and were analyzed with χ^2 tests. An alpha level of .05 was used for all analyses, and all statistical significance tests were 2-sided. Analyses were performed using the SPSS Statistical Software Package (SPSS Inc, Chicago, Illinois).[20]

Qualitative data were analyzed using a grounded theory approach, allowing themes to emerge from each narrative. Two authors coded each narrative independently and compared the results. Discrepancies in their findings were discussed until an agreement was met between the 2 authors. No new themes emerged following the first 30 narratives, suggesting that thematic saturation was achieved.

Ethical Considerations

The study was approved by the participating university's Institutional Review Board (IRB). Consent was implied, as the survey was voluntary with the statement at the top: "By filling out this survey, you and your parent or

Table 1. Demographics and Characteristics of Survey Population.

	No. (%)
Age, y	
0 to 10	44 (7.7)
11 to 14	172 (30.0)
15 to 17	213 (37.2)
18 to 21	144 (25.1)
Gender	
Female	370 (64.7)
Male	202 (35.3)
Race	
Black	65 (11.3)
White	450 (78.5)
Other	58 (10.1)
Month of visit	
July	117 (20.4)
August	130 (22.7)
September	154 (26.9)
October	170 (29.7)
Who filled out the survey	
Patient	204 (35.9)
Parent/guardian	364 (64.1)

guardian are giving permission to use your data to better understand the effects of the COVID-19 pandemic on mental health." Parents were notified if their child was filling out the survey and assented to all survey submissions. All data were de-identified prior to data analysis.

Results

During the 4-month study period, 573 individuals completed the survey. When comparing all patients eligible to complete the survey with the survey participants, the response rate was 61.4%. The average patient age was 15.8 (SD = 3.8) years and 64.7% were female. Most surveys were completed by the parent or guardian of the individual (n = 364, 64%). Sociodemographic characteristics are summarized in Table 1.

The results showed that about 38% of respondents reported that the COVID-19 pandemic "somewhat" or "definitely" played a role in the individual's psychiatric emergency visit. Anxiety was the symptom most frequently reported as increased due to the pandemic (72%), followed by depression (66%), suicidal thoughts or behaviors (45%), aggression (31%), family conflict (31%), and self-injurious behavior (26%) (see Table 2). Only 16% of respondents reported the COVID-19 pandemic had not increased any mental health symptoms.

There was significantly increased aggression reported in children ages 10.9 years and below (n = 21, 65.6%) compared with those ages 11.0 to 14.9 years (n = 44, 30.6%), 15.0 to 17.9 (n = 43, 26.7%), and 18 to 21.9 (n = 36, 29.5%) ($P < .001$; see Figure 1). Multivariable logistic regression analysis showed that the odds of reporting increased aggression remained statistically significantly higher in children ages 1 to 10.9 years relative to other age groups after statistically controlling for gender, race, and month of visit (adjusted odds ratio [AOR] = 4.5, $P < .001$). When examining symptoms based on sex, there was more anxiety attributed to the pandemic in females compared with males (75.2% vs 65.6%, $P = .03$), more depression in females compared

Table 2. Percentage of Respondents Reporting Changes due to the COVID-19 Pandemic.

	N	Percentage[a]
Increase in symptoms		
Anxiety	330	72
Depression	303	66
Suicidal thoughts or behavior	206	45
Aggression	144	31
Family conflict	141	31
Self-injurious behavior	119	26
Obsessive-compulsive symptoms	91	20
Symptoms of psychosis	49	11
It has not increased the symptoms	71	16
Most negative events or changes to daily life		
Not seeing friends in person	323	66
Having to stay home	294	60
Increased stress or disorientation from not having a schedule	285	58
Not going to school	274	56
Spending more time with family	116	24
Thinking about how many people are dying because of the virus	61	12
Worried about someone who has or has had the virus	47	10
Not having access to things I need	34	7
Most positive events or changes to daily life		
Reduced amount of schoolwork or no schoolwork	296	71
More time to relax	184	44
Getting more sleep	168	40
Less stress/pressure from school and activities	161	38
Spending more time with family	150	36
Spending more time with my pet(s)	157	32
Getting to watch more TV/movies	129	31
Getting more recreational time on the phone/computer	126	30
Not having to have unwanted interactions with other kids at school	124	30
Getting to do things I do not usually have time for	111	27
More time to exercise or go outside	100	24
Feeling like I have more control in creating my own schedule	64	15

[a]Sample sizes for each question vary due to missing data (not every respondent answered every question).

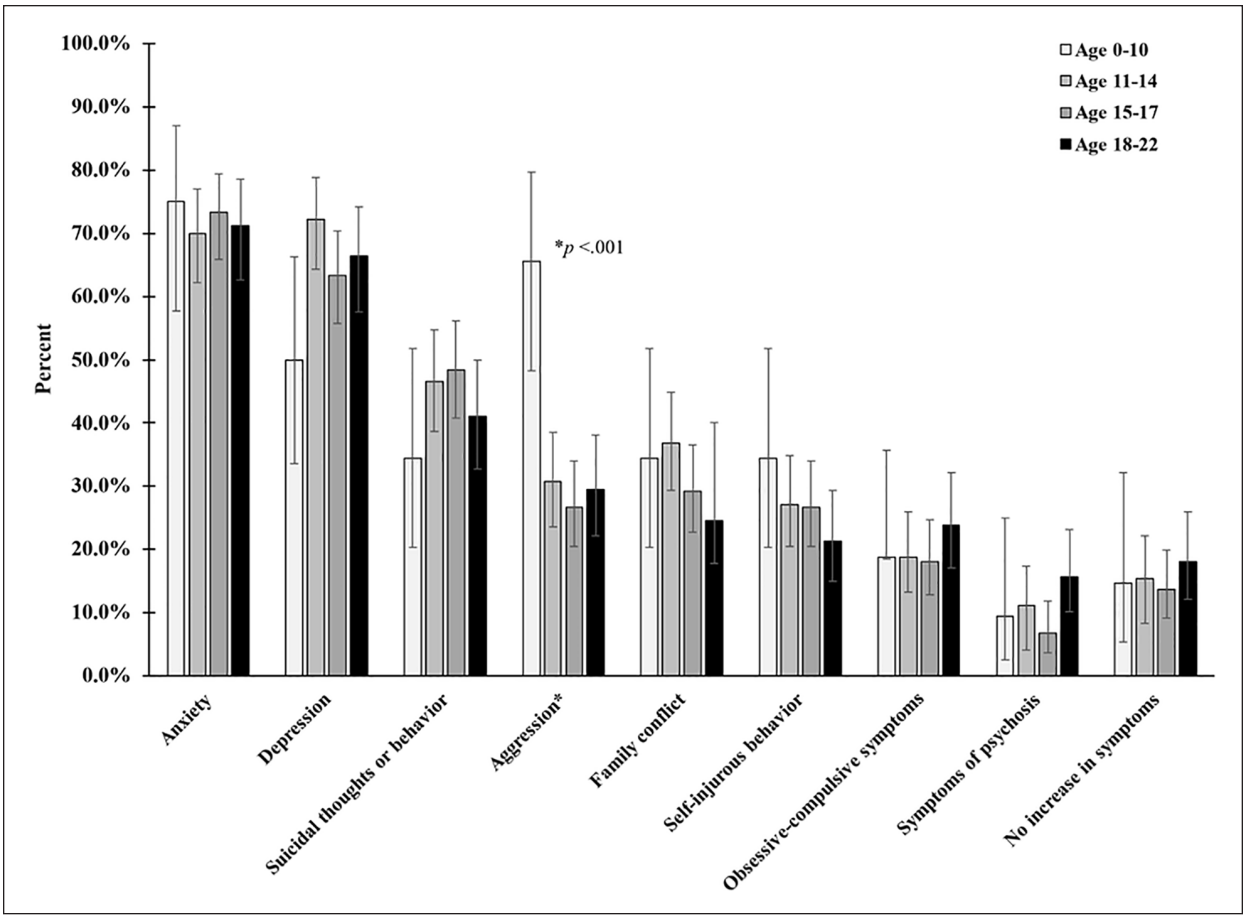

Figure 1. Percentage of respondents reporting symptoms increased secondary to COVID-19 pandemic by age.

with males (70.5% vs 57.3%, $P = .005$), more self-injurious behavior in females compared with males (29.1% vs 19.7%, $P = .03$), more suicidal thoughts and behaviors in females compared with males (50.0% vs 35.0%, $P = .002$), and more aggression in males compared with females (42.7% vs 25.5%, $P < .001$; see Figure 2). Multivariable logistic regression analysis showed that, even after statistically controlling for age, race, and month of visit: (*a*) females had higher odds than males of reporting increased anxiety (AOR = 1.7, $P = .02$), depression (AOR = 1.8, $P = .01$), self-injurious behavior (AOR = 1.7, $P = .03$), and suicidal thoughts and behaviors (AOR = 2.1, $P = .001$) and (*b*) males had higher odds than females of reporting more aggression (AOR = 2.0, $P = .001$). The percentage of respondents who reported increases in anxiety attributable to the pandemic steadily increased through the 4 months of the study ($P = .02$; see Figure 3).

When examining non-mental health symptom impacts from the pandemic, most respondents reported that the largest change was increased boredom (76% of respondents). Other changes include inability to socialize (70%), inability to go places (62%), lack of structure (59%), and more stress due to family members being home more (48%). A majority of respondents reported the most negative change of daily life due to the pandemic was not seeing friends in person (66%), followed by having to stay home (60%), increased stress or disorientation from not having a schedule (58%), and not going to school (56%; see Table 2).

Not all COVID-19-related life changes were considered negative. 6.5% and 3.0% of respondents, respectively, reported there were "a lot" or "a great deal" of positive changes in their daily life due to the COVID-19 pandemic. A majority (71%) reported the most positive change has been the reduced amount of schoolwork. Other positive changes included more time to relax (44%), getting more sleep (40%), less stress from school and activities (38%), more time with family (36%), and more time with their pets (32%). Of note, nearly

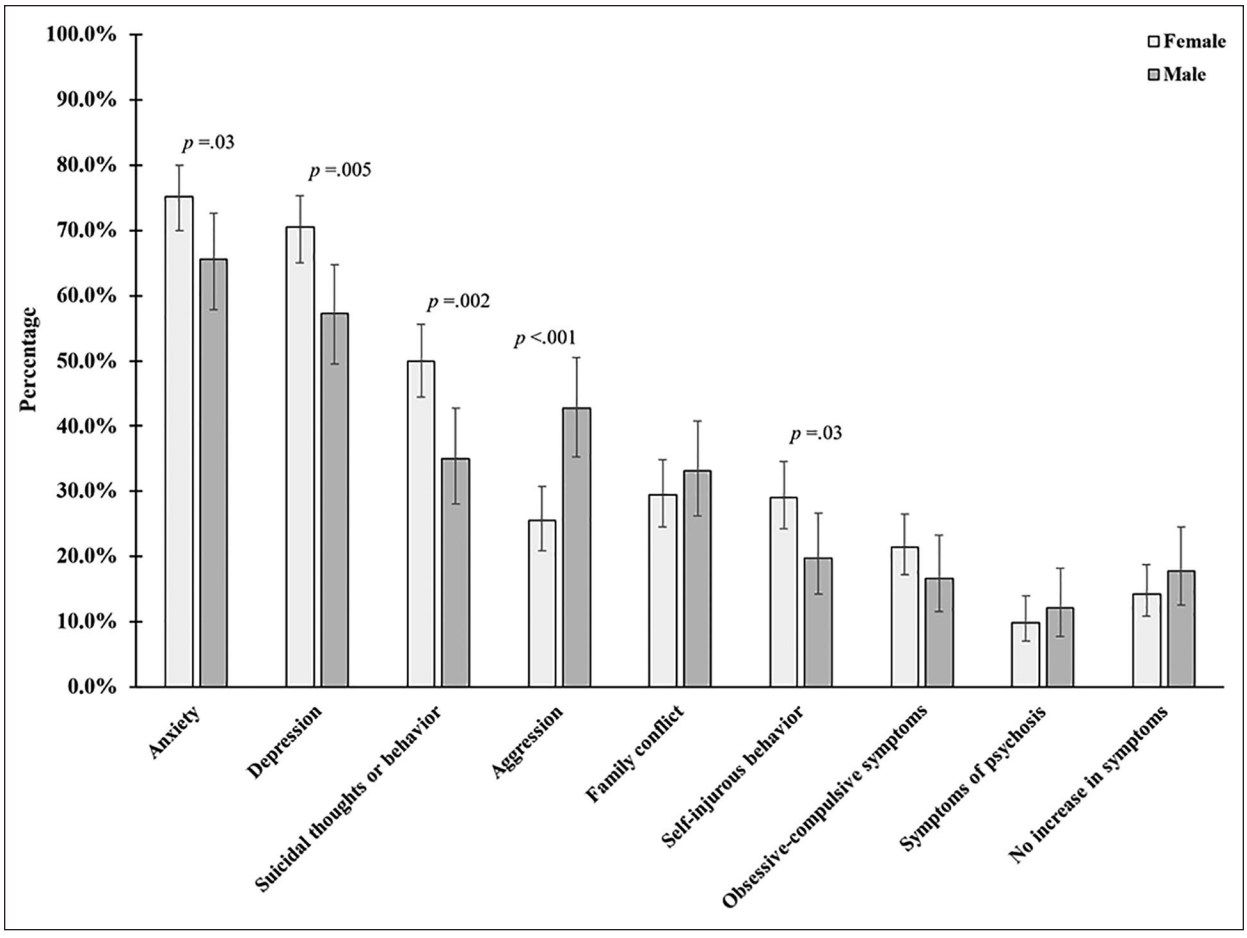

Figure 2. Percentage of respondents reporting symptoms increased secondary to COVID-19 pandemic by sex.

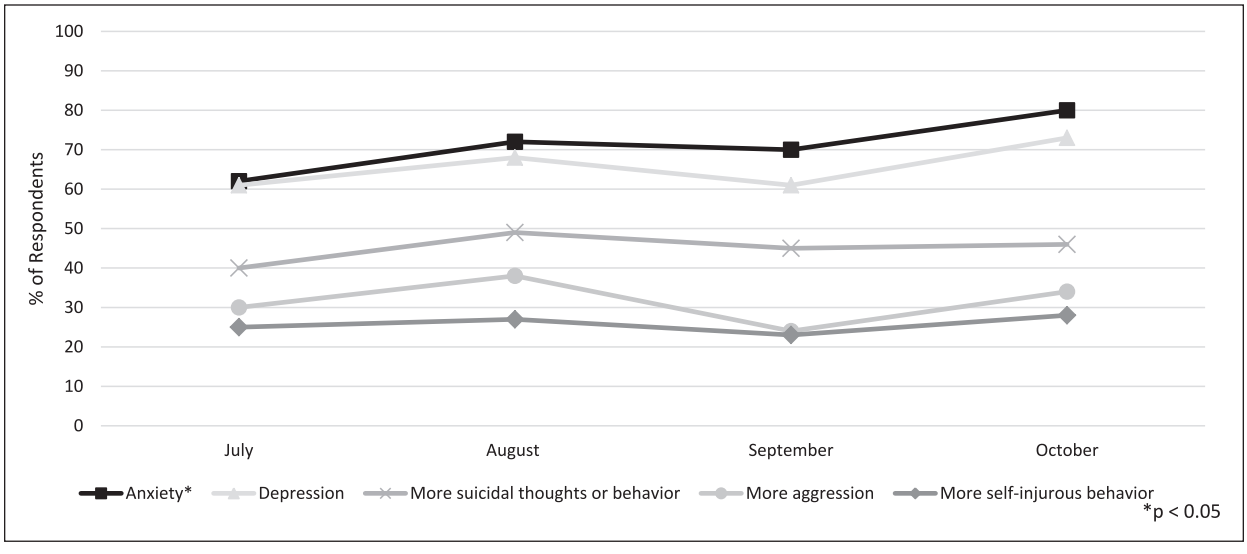

Figure 3. Percentage of respondents reporting increased symptoms secondary to COVID-19 pandemic over time.

one-third of respondents (30%) reported that the COVID-19 pandemic reduced the number of unwanted interactions with other children at school.

A large number of participants (38%) reported that the COVID-19 pandemic had caused a change or closure of their health care access, including mental health providers. More than one-fifth (n = 101, 22%) of respondents stated lack of access to care due to the pandemic necessitated them seeking care in the emergency department. In addition, 37% of respondents (n = 196) anticipated that it would be difficult to receive follow-up because of the pandemic. Furthermore, 8% of respondents (n = 43) reported fear of being exposed to COVID-19 in the emergency department leading to a delay of care.

Sample size mitigated the ability to differentiate based on race, so that category was separated into white, black, and other. Limited analysis found that individuals who identify as black are less likely to report an increase in self-injurious behaviors compared with any other population ($P = .007$). In addition, black individuals were more likely to report financial impacts from the COVID-19 pandemic including inability to access food, cleaning or other supplies ($P = .006$), needing to provide childcare due to school closings ($P = .03$), and other financial concerns ($P = .009$). Multivariable logistic regression analysis showed that, even after statistically controlling for age, gender, and month of visit: (*a*) blacks had lower odds than whites to report increased self-injurious behavior (AOR = 0.3, $P = .01$) and (*b*) blacks had higher odds than whites to report inability to access food (AOR = 2.7, $P = .12$), needing to provide childcare due to school closings (AOR = 2.3, $P = .07$), and having other financial concerns (AOR = 2.1, $P = .10$), although these associations no longer reached statistical significance.

When comparing surveys filled out by a parent/guardian of a patient versus surveys filled out by a patient themselves, there were some statistically significant differences, primarily related to the question regarding most negative events or changes to daily life attributed to the COVID-19 pandemic. More of the surveys filled out by a parent/guardian indicated not being able to see friends in person (70% vs 58%) or not going to school (66% vs 39%) as negative changes when compared with surveys filled out by patients. Conversely, more surveys filled out by patients indicated thinking about people dying from the virus (18% vs 9%) or not having access to the things they need (10% vs 5%) as negative changes when compared with surveys filled out by a parent/guardian.

In examining participants' qualitative responses to identify other impacts from the COVID-19 pandemic that were not addressed specifically in the survey, there were 109 responses, with 8 antecedent themes were identified: access to care, change in routine, employment/finances, fear, isolation, recent death of a family member or friend, school, and worsening mood or psychiatric condition. These were organized into 3 major categories as follows: mental health, daily life or activities, and direct COVID-19 impacts. Nearly one-half of the responses focused on mental health, covering topics such as mood ("she is angry all the time") to anhedonia ("my daughter has no motivation to do anything and is becoming addicted to electronics") to new maladaptive behaviors ("eating disorder to instill some sense of control"). An additional 20% of responses focused on the changes to daily life secondary to the pandemic. Comments focused on the change in routine ("frustrated with lack of structure, misses his friends") and the missed opportunities ("Drivers education has been interrupted"; "she lost out on the lead in her school musical, she had her 8th grade trip to DC canceled, she had her big farewell at school canceled."). Several quotes highlight how the pandemic exacerbated existing stressors: "Like a rug pulled out from under us when things were already stressful and difficult. COVID did not create those things, but greatly amplified those problems/stresses by restricting access and creating isolation as well as broken routines." More simply put by another respondent, "Everything is just harder." The categories and their frequencies as well as additional quotes are described in Table 3.

Discussion

This study used detailed survey questions to examine effects of the COVID-19 pandemic on children and adolescents who visit a psychiatric emergency department. The COVID-19 pandemic has had a broad impact on children and adolescents, and altered school programming, peer interactions, family dynamics, and the health care system, with the subsequent effects on mental health symptoms being evident in the study results. It is notable that as the months of the study progressed, there was a trend of increasing numbers of study participants as well as overall eligible patient volume. A possible factor for the lower volume of patients earlier in the pandemic was the hesitancy in seeking emergency services due to fears of contracting COVID-19, as knowledge about disease transmission was limited, as well as "stay at home" mandates raising the threshold for seeking care. This trend is consistent with results from similar studies from other emergency departments.[14,21] Although ~8% of respondents reported that they delayed their visit due to concerns of contracting

Table 3. Themes from Other COVID-19 Pandemic Impacts from Qualitative Analysis.

Theme	Paradigm examples	No. (%)
Mental health		49 (48)
Worsening mood or psychiatric condition	"She is sleeping all day moody not interested in anything. Her close friend attempted suicide three days ago . . . didn't tell us for three days, stayed in bed."	27 (26)
Isolation	"Complete isolation since I live alone with my dog, unless I can find someone to spend time with which is increasingly rare."	16 (16)
Fear	"Increased perseverance on fear of loss of loved ones."	6 (6)
Daily life/activities		43 (41)
Change in routine	"When gymnastics was cancelled, this significantly impacted her."	23 (22)
Employment/financial	"Parent's more stressed about job/money."	15 (14)
School	"School virtually is difficult."	5 (5)
Direct COVID impact		11 (11)
Access to care	"We had a recommendation for partial hospitalization after our last PES visit, but Hospital X was not accepting in person patients."	8 (8)
Recent death of family member or friend	"His great-grandmother died last Sunday. We were unable to go say goodbye before she passed or mourn with family."	3 (3)

Abbreviation: PES, Psychiatric Emergency Services.

COVID-19 in the hospital, this almost certainly underrepresents the true number of patients dissuaded from seeking emergency care, as only those who did present to PES were captured.

More than a third of respondents reported that COVID-19 somewhat or definitely played a role in their emergency visit. Although it may be expected that those presenting to PES would have been impacted negatively by the pandemic, the extremely high percentage of those (more than two-thirds) who reported increases in anxiety and depression due to the pandemic is notable. Younger children were reported to have statistically significantly more increases in reported aggression attributed to the pandemic than did older youth. This underscores the psychological impacts of the COVID-19 pandemic on younger children, whose disruptions in social and school routines were extensive and maybe more reflected in behavioral changes than older youth.[3,22,23] Reported increases in anxiety attributed to the pandemic steadily increased through the time frame of the study, which supports widespread concerns about impacts on children as the pandemic wore on.[24]

There were statistically significant differences in reported increases in symptoms by sex, with more male patients reporting increased aggression and more female patients reporting increased depression, anxiety, suicidal thoughts and behaviors, and self-harm. This is largely in line with sex-based differences in the prevalence of these symptoms in general, but highlights how pandemic-related issues may manifest differently in males compared with females.[25-28] Higher levels of stress due to family members spending more time at home were reported by almost half of respondents, which may have played a role in the documented increase of domestic violence incidents during the pandemic.[29]

Access to mental health services for children and adolescents had been challenging even prior to the pandemic,[30] and it is concerning that about a third of respondents reported that COVID-19 caused changes or closings of their mental health or health care services, with many of those reporting that those alterations in access necessitated the emergency visit. Notably, many children receive mental health services through schools,[14] which may be an unintended consequence of school closures or a switch to online learning. Again, this likely represents a small sample of the true number of children and adolescents who experienced challenges accessing care during the pandemic.

Although data on race and ethnicity are limited due to the study populations, the findings were consistent with national trends, with black individuals less likely to engage in self-harm behaviors and more likely to report financial concerns.[31,32] Given that racial and ethnic minority communities worldwide have been disproportionally affected by COVID-19, future research should focus on identifying the mental health impacts of the pandemic on this population.[32]

When reviewing the differences between surveys filled out by patients versus those filled out by a parent/guardian, it is important to note that there was a significant age correlation with who filled out the survey. For younger children, the vast majority of surveys were filled out by their parent/guardian, while for teens, the majority filled the surveys out themselves. Therefore, it may be most useful to view these differences as an age effect, while still recognizing the inherent parental bias

that may be present when answering the survey questions on the patient's behalf.

Most of the discussion has been around the negative effects of the COVID-19 pandemic, but it is important to explore and recognize all of the resulting effects from the lifestyle changes that have occurred, including some changes that were felt to be beneficial. Reduced schoolwork, and more time to relax and exercise were among the positive effects reported by survey participants. This study's data are not able to determine whether school format (in person vs hybrid vs virtual) had an effect on responses.

These data have implications well beyond the emergency setting. The increase in psychiatric symptoms such as aggression and anxiety coupled with the challenges with accessing mental health care affects all health care professionals involved with the care of children. Health care providers should be aware of the evolving mental health needs of children and adolescents and the barriers to care. Understanding that the COVID-19 pandemic has increased specific mental health symptom domains can potentially help to better target screening and intervention.

Limitations

This study has several main limitations. The study population only includes children and adolescents seeking psychiatric emergency care at a single site; therefore, the results may not be generalizable to the effects on a wider population.[33] As previously mentioned, many of the surveys were completed by the parent/guardian with 93% of surveys filled out by the parent/guardian for those below 11 years of age compared with only 10% in the older age group. This may have impacted the results as the answers could reflect a parental bias, as they are sharing their view of their child's symptoms, rather than direct reports from their child. This questionnaire was not a validated tool, which limits its reliability. However, as this was early in the pandemic, it was felt to be important to gather and report these data despite not having a validated tool. The questionnaire was completed on a voluntary basis making it possible that patients who were at higher levels of distress or with certain characteristics chose not to participate, potentially limiting the interpretation of the results. Included in the limitations of survey methodology is that it depends on respondents' self-report, and understanding the survey and accurately answering the questions. The data in this study are limited to a defined time period: July to October 2020 thus would not capture trends at the earliest point in the pandemic, nor the impact on mental health effects later in the pandemic. We also had no way to assess symptoms in children and adolescents who needed mental health care but did not present due to fears of exposure to COVID-19, which could introduce some ascertainment bias into our sample. Finally, our sample was mostly white and did not reflect the racial diversity present in other treatment settings.

Conclusion

In summary, this study examined the effects of the COVID-19 pandemic on children and adolescents presenting to a psychiatric emergency department. Significantly increased levels of psychiatric symptoms—particularly anxiety, depression, and suicidal ideation—attributable to the COVID-19 pandemic were reported. Furthermore, access to outpatient mental health services was more challenging for many individuals. Certain psychosocial aspects of the pandemic such as lack of structure and virtual schooling have likely affected different demographic groups in distinct ways. Further research is indicated to examine continued effects of the pandemic following the time frame of this study, and a continued focus is needed to bolster social programs and access to adequate mental health treatment options to counteract the pandemic's negative effects for children and adolescents.

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Author Contributions

Mr. Erjavac drafted the initial manuscript, reviewed and revised the manuscript, coordinated and supervised data collection, and critically reviewed the manuscript for important intellectual content.

Drs. Rolin and Gondy drafted the initial manuscript, reviewed and revised the manuscript, coordinated and supervised data analysis, and critically reviewed the manuscript for important intellectual content.

Dr. Cranford drafted the initial manuscript, reviewed and revised the manuscript, provided statistical analysis of the data, and critically reviewed the manuscript for important intellectual content.

Drs. Shobassy and Biermann drafted the initial manuscript, reviewed and revised the manuscript, and critically reviewed the manuscript for important intellectual content.

Drs. Rogers and Hong conceptualized and designed the study, drafted the initial manuscript, and reviewed and revised the manuscript, and critically reviewed the manuscript for important intellectual content.

All Authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

The study was approved by the participating university's Institutional Review Board (IRB; reference # HUM00184559).

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Supplemental Material

Supplemental material for this article is available online.

References

1. Salari N, Hosseinian-Far A, Jalali R, et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *Global Health*. 2020;16(1):57. doi:10.1186/s12992-020-00589-w.
2. Ahmed MZ, Ahmed O, Aibao Z, Hanbin S, Siyu L, Ahmad A. Epidemic of COVID-19 in China and associated psychological problems. *Asian J Psychiatr*. 2020;51:102092. doi:10.1016/j.ajp.2020.102092.
3. Loades ME, Chatburn E, Higson-Sweeney N, et al. Rapid systematic review: the impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19. *J Am Acad Child Adolesc Psychiatry*. 2020;59(11):1218-1239. doi:10.1016/j.jaac.2020.05.009.
4. Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public—a systematic review and meta-analysis. *Psychiatry Res*. 2020;291:113190. doi:10.1016/j.psychres.2020.113190.
5. Singh S, Roy D, Sinha K, Parveen S, Sharma G, Joshi G. Impact of COVID-19 and lockdown on mental health of children and adolescents: a narrative review with recommendations. *Psychiatry Res*. 2020;293:113429. doi:10.1016/j.psychres.2020.113429.
6. Lazzari C, Shoka A, Nusair A, Rabottini M. Psychiatry in time of COVID-19 pandemic. *Psychiatr Danub*. 2020;32(2):229-235. doi:10.24869/psyd.2020.229.
7. Meherali S, Punjani N, Louie-Poon S, et al. Mental health of children and adolescents amidst COVID-19 and past pandemics: a rapid systematic review. *Int J Environ Res Public Health*. 2021;18(7):3432.
8. Schmidt SJ, Barblan LP, Lory I, Landolt MA. Age-related effects of the COVID-19 pandemic on mental health of children and adolescents. *Eur J Psychotraumatol*. 2021;12(1):1901407. doi:10.1080/20008198.2021.1901407.
9. Brooks SK, Webster RK, Smith LE, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet*. 2020;395(10227):912-920. doi:10.1016/s0140-6736(20)30460-8.
10. Lo CB, Bridge JA, Shi J, Ludwig L, Stanley RM. Children's mental health emergency department visits: 2007-2016. *Pediatrics*. 2020;145(6):e20191536. doi:10.1542/peds.2019-1536.
11. Clerici M, Durbano F, Spinogatti F, Vita A, de Girolamo G, Micciolo R. Psychiatric hospitalization rates in Italy before and during COVID-19: did they change? an analysis of register data. *Ir J Psychol Med*. 2020;37(4):283-290. doi:10.1017/ipm.2020.29.
12. Dragovic M, Pascu V, Hall T, Ingram J, Waters F. Emergency department mental health presentations before and during the COVID-19 outbreak in Western Australia. *Australas Psychiatry*. 2020;28(6):627-631. doi:10.1177/1039856220960673.
13. Hoyer C, Ebert A, Szabo K, Platten M, Meyer-Lindenberg A, Kranaster L. Decreased utilization of mental health emergency service during the COVID-19 pandemic. *Eur Arch Psychiatry Clin Neurosci*. 2021;271(2):377-379. doi:10.1007/s00406-020-01151-w.
14. Leeb RT, Bitsko RH, Radhakrishnan L, Martinez P, Njai R, Holland KM. Mental health-related emergency department visits among children aged <18 years during the COVID-19 pandemic—United States, January 1-October 17, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(45):1675-1680. doi:10.15585/mmwr.mm6945a3.
15. Shobassy A, Nordsletten AE, Ali A, Bozada KA, Malas NM, Hong V. Effects of the COVID-19 pandemic in a psychiatric emergency service: utilization patterns and patient perceptions. *Am J Emerg Med*. 2021;52:241-243. doi:10.1016/j.ajem.2021.03.082.
16. DeLaroche AM, Rodean J, Aronson PL, et al. Pediatric emergency department visits at US children's hospitals during the COVID-19 pandemic. *Pediatrics*. 2021;147(4):e2020039628.
17. Hill RM, Rufino K, Kurian S, Saxena J, Saxena K, Williams L. Suicide ideation and attempts in a pediatric emergency department before and during COVID-19. *Pediatrics*. 2021;147(3):e2020029280.
18. Ramachandran S, Bhaskar G. A hidden cost of Covid: shrinking mental-health services. *The Wall Street Journal*. October 9, 2020. Accessed August 16, 2022. https://www.wsj.com/articles/a-hidden-cost-of-covid-shrinking-mental-health-services-11602255729.
19. Ladouceur CD. COVID-19 adolescent symptom & psychological experience questionnaire. Date unknown. Accessed June 8, 2020. https://www.phenxtoolkit.org/toolkit_content/PDF/CASPE_Parent_Social.pdf.
20. IBM Corp. *IBM SPSS Statistics for Windows, Version 27.0*. Armonk, NY: IBM Corp; 2020.

21. Matera L, Nenna R, Rizzo V, et al. SARS-CoV-2 pandemic impact on pediatric emergency rooms: a multicenter study. *Int J Environ Res Public Health*. 2020;17(23):8753. doi:10.3390/ijerph17238753.
22. de Figueiredo CS, Sandre PC, Portugal LCL, et al. COVID-19 pandemic impact on children and adolescents' mental health: biological, environmental, and social factors. *Prog Neuropsychopharmacol Biol Psychiatry*. 2021;106:110171. doi:10.1016/j.pnpbp.2020.110171.
23. Jiao WY, Wang LN, Liu J, et al. Behavioral and emotional disorders in children during the COVID-19 epidemic. *J Pediatr*. 2020;221:264-266. doi:10.1016/j.jpeds.2020.03.013.
24. Courtney D, Watson P, Battaglia M, Mulsant BH, Szatmari P. COVID-19 impacts on child and youth anxiety and depression: challenges and opportunities. *Can J Psychiatry*. 2020;65(10):688-691. doi:10.1177/0706743720935646.
25. Li LZ, Wang S. Prevalence and predictors of general psychiatric disorders and loneliness during COVID-19 in the United Kingdom. *Psychiatry Res*. 2020;291:113267. doi:10.1016/j.psychres.2020.113267.
26. McQuaid RJ, Cox SML, Ogunlana A, Jaworska N. The burden of loneliness: implications of the social determinants of health during COVID-19. *Psychiatry Res*. 2021;296:113648. doi:10.1016/j.psychres.2020.113648.
27. Shahriarirad R, Erfani A, Ranjbar K, Bazrafshan A, Mirahmadizadeh A. The mental health impact of COVID-19 outbreak: a Nationwide Survey in Iran. *Int J Ment Health Syst*. 2021;15(1):19. doi:10.1186/s13033-021-00445-3.
28. Vindegaard N, Benros ME. COVID-19 pandemic and mental health consequences: systematic review of the current evidence. *Brain Behav Immun*. 2020;89:531-542. doi:10.1016/j.bbi.2020.05.048.
29. Bradbury-Jones C, Isham L. The pandemic paradox: the consequences of COVID-19 on domestic violence. *J Clin Nurs*. 2020;29(13-14):2047-2049. doi:10.1111/jocn.15296.
30. Radez J, Reardon T, Creswell C, Lawrence PJ, Evdoka-Burton G, Waite P. Why do children and adolescents (not) seek and access professional help for their mental health problems? A systematic review of quantitative and qualitative studies. *Eur Child Adolesc Psychiatry*. 2021;30(2):183-211. doi:10.1007/s00787-019-01469-4.
31. Kuentzel JG, Arble E, Boutros N, Chugani D, Barnett D. Nonsuicidal self-injury in an ethnically diverse college sample. *Am J Orthopsychiatry*. 2012;82(3):291-297. doi:10.1111/j.1939-0025.2012.01167.x.
32. Monto MA, McRee N, Deryck FS. Nonsuicidal self-injury among a representative sample of US adolescents, 2015. *Am J Public Health*. 2018;108(8):1042-1048. doi:10.2105/AJPH.2018.304470.
33. Xiong J, Lipsitz O, Nasri F, et al. Impact of COVID-19 pandemic on mental health in the general population: a systematic review. *J Affect Disord*. 2020;277:55-64. doi:10.1016/j.jad.2020.08.001.