ORIGINAL ARTICLE
https://doi.org/10.30773/pi.2025.0338
eISSN 1976-3026
OPEN ACCESS
Psychiatry Investig 2026 March 13 [Epub ahead of print]

Mental Health Admissions in Child and Adolescents Over Pandemic Period: A Health Records Study

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Objective The emergence of the coronavirus disease 2019 (COVID-19) pandemic led to numerous changes worldwide. Due to restrictive measures, hospital admission patterns changed in child and adolescent psychiatry, as in all other medical specialties. Although there are studies investigating the impact of the COVID-19 pandemic on mental health, research examining the reasons for hospital admissions and changing trends among children and adolescents remains limited.

Methods This study used data from the hospital information system of a university hospital and included patients aged 0–18 years. Data were analyzed across three periods: one year before the pandemic, one year during the pandemic, and one year after the complete lifting of all COVID-19–related restrictions. All 10th revision of the International Classification of Diseases "F" diagnostic codes were included in the analysis.

Results A total of 7,500 unique admissions were included. Diagnostic distributions differed significantly across periods ($p<0.001$). The leading causes of admission were attention-deficit/hyperactivity disorder (23.5%, n=1,766), psychiatric evaluation (16.3%, n=1,223), and childhood- and adolescent-onset disorders (13.6%, n=1,022). The diagnosis of other childhood- and adolescent-onset behavioral and emotional disorders (F98) showed significant changes in the pre-pandemic period and as a secondary diagnosis post-pandemic.

Conclusion Changes in hospital admissions during the pandemic, especially for neurodevelopmental and severe mental disorders (e.g., autism), suggest stable overall admission rates but a possible increase in externalizing problems. It was suggested that the pandemic did not directly increase psychiatric disorders in children and adolescents but was associated with an increase in externalizing problems.

Psychiatry Investig

Keywords Child psychiatry; Adolescent psychiatry; Pandemics; Neurodevelopmental disorders; COVID-19.

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic has led to significant global changes. As case numbers increased, many countries implemented various measures such as social isolation, the closure of schools and workplaces, and the enforcement of social distancing. While these measures were essential for controlling the spread of the virus, they also contributed to substantial economic challenges and the emergence of issues that have adversely affected mental health.[1] Nevertheless, it remains unclear which specific mental disorders have become more prevalent during the pandemic and which conditions carry a higher risk. Studies conducted during previous outbreaks—such as the Severe Acute Respiratory Syndrome epidemic—as well as rapid survey studies conducted during the COVID-19 pandemic, have identified associations between the pandemic and increased levels of depression, anxiety disorders, and reduced quality of life.[2,3]

Some cross-sectional studies have reported an increase in depression and anxiety disorders during the pandemic. However, these studies lack data from the pre-pandemic period and do not provide information about the participants' mental health status prior to the pandemic.[4] This limitation means that such studies do not investigate whether the adverse psychiatric outcomes observed during the pandemic occurred in individuals with pre-existing psychiatric conditions who sought hospital care due to COVID-19-related measures, or whether these individuals had previously accessed psychiatric services. Documenting the course of these public health measures and the effects they have had during the pandemic—particularly during quarantine periods and thereafter—is of great impor-

Received: October 3, 2025 **Revised:** January 2, 2026
Accepted: January 29, 2026

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tance. Such documentation is essential for generating clinically meaningful findings that can guide and optimize responses to future public health emergencies.[5]

The COVID-19 pandemic has had a profound and multifaceted impact on mental health, leading to increased prevalence of anxiety, depression, and stress-related disorders across diverse populations. Prolonged social isolation, economic uncertainty, and disruptions to daily routines have been identified as key factors exacerbating psychological distress during the pandemic period. Some early studies focused primarily on examining how the COVID-19 pandemic affected mental health among healthcare workers and adult individuals.[6] However, children and adolescents are at a higher risk of developing mental health problems compared to adults,[7] due to quarantine measures that disrupt physical activity and social interactions, individuals may be more vulnerable to the negative effects of isolation, particularly the closure of schools.[8]

Public health issues, such as pandemics, not only negatively affect physical health but also mental health. Children are particularly vulnerable to these situations due to their limited ability to understand events.[9] The lack of coping strategies makes it more difficult for individuals to protect themselves both physically and psychologically. Children and adolescents may not be able to express their emotions in the same way as adults.[10] Due to school closure measures implemented during the pandemic, children were unable to socialize with their peers, and in this developmental period when peer relationships are critically important, such disruptions may have contributed to increased anxiety and depressive symptoms among children. Exposure to media reports about the crisis and access to unverified information circulating on social media can further exacerbate their psychological distress.[11]

A child's response to a crisis situation can vary depending on previous emergency experiences, physical and mental health, the family's socio-economic conditions, and cultural background. Various studies have shown that anxiety, depression, sleep and appetite disturbances, and disruptions in social interactions are among the most commonly observed symptoms, which also contribute to an increase in hospital admissions.[12]

During the pandemic, hospital admissions and their frequencies have changed.[13] Studies have shown that, prior to the pandemic, self-harm and suicidal thoughts were less frequently observed in hospital admissions compared to the pandemic period. This increase in hospital admissions during the pandemic is likely due to difficulties in accessing substances, leading to a significant rise in substance-related hospital visits.[13] During the COVID-19–related lockdowns, individuals with substance use disorders experienced significant disruptions in access to substances, which may have contributed to withdrawal symptoms, psychological distress, and increased help-seeking behavior. Several reports suggest that reduced availability of substances during periods of restricted mobility was associated with a rise in emergency department (ED) visits and hospital admissions among this population.[14] These findings highlight the indirect effects of pandemic containment measures on healthcare utilization among individuals with substance use disorders. Another study examining hospital admissions before and after the lockdown found that, similar to other studies, hospital admissions were more closely related to emotional symptoms such as suicidal thoughts and agitation/excitation.[15]

In line with the aforementioned considerations, the aim of this study is to investigate whether there has been a change in hospital admissions to the child psychiatry department of a research hospital during the COVID-19 pandemic, both in terms of diagnostic and qualitative aspects. Although previous studies have examined the effects of COVID-19 on mental health, no study to date has been identified in the literature that specifically investigates how hospital admissions have altered the nature of presenting complaints among the pediatric and adolescent population. For this purpose, psychiatric diagnoses, the overall number of hospital admissions, and some sociodemographic data have been utilized quantitatively.

METHODS

Data and study design

In this study, data obtained through the hospital information system of a training and research hospital were used. The study included patients aged 0–18 years. The start of the pandemic was considered as the date of the first case in the country where the study was conducted (March 11, 2020). The data were divided into three distinct periods: one year prior to the COVID-19 pandemic (March 11, 2019–March 11, 2020), one year during the pandemic (March 11, 2020–March 11, 2021), and one year after the pandemic was fully concluded (March 11, 2023–March 11, 2024). When defining the post-pandemic period, the timeframe selected corresponded to the point at which the government lifted all COVID-19–related restrictions and lockdown measures, with no subsequent reimplementation of preventive policies; this period was defined as March 2023. The period between April 29, 2021, and May 17, 2021, which full lockdowns were enforced in the country, was excluded from the analysis, as the hospital's child psychiatry clinics were not active during this time.

In the study, conditions such as attention-deficit/hyperactivity disorder (ADHD), developmental delay, autism, requests for medical documentation, issues typically beginning in childhood and adolescence, speech delay, and anxiety disorders, which are the most frequent reasons for visits to child psy-

chiatry clinics, were evaluated and compared based on trends of increase or decrease within their respective categories.

In addition to sociodemographic data such as age, gender, number of hospital admissions, and place of residence, psychiatric diagnoses were extracted from the available data. All "F" codes from the 10th revision of the International Classification of Diseases diagnostic classification were included in the evaluation. All codes from F01 to F99 were considered for the study. Furthermore, all non-psychiatric admissions to the hospital were also included in the analysis. Repeated data and repeated admissions by the same patients were excluded from the study. Secondary comorbid psychiatric diagnoses, if present, were also examined alongside the primary diagnoses. All identifiable patient data was anonymised prior to data analysis to ensure protection of all sensitive and personal details. In 3 years, some admissions were noted to have incomplete data. For this reason, inferential statistics were completed only where the data were available.

Statistical analysis

Data analysis was performed using IBM SPSS version 27 (IBM Corp.). Descriptive statistics were visually presented through line graphs, grouped bar charts, and tables. To compare the prevalence (expressed as percentages) of primary mental health diagnoses across the years before, during, and after the pandemic, a z-test and chi-square (χ^2) test were applied to assess the difference between two proportions. For continuous variables such as age and number of admissions, one-way analysis of variance was used, and the post-hoc Tamhane test was applied to clarify differences between groups. A significance level (p-value) of 0.05 was considered for both tests.

In terms of ethical approval, permission was obtained from the Ethics Committee of the Faculty of Health Sciences at Yalova University for the collection, analysis, and publication of retrospective and anonymized data within the scope of this non-interventional study. An informed consent form was filled out by all participants and their parents participating in the study.

RESULTS

Number of admissions

In the study, hospital admissions before, during, and after COVID-19 were evaluated. During the 3-year period in which the study was designed, a total of 20,118 child psychiatry outpatient admissions were recorded. Of these, 9,213 were in the pre-pandemic period, 4,617 during the pandemic, and 6,288 in the post-pandemic period. After excluding repeated admissions, it was determined that there were 7,500 unique admissions. Out of 7,500 admissions to the child psychiatry clinic, 4,610 (61.5%) were male and 2,890 (38.5%) were female. No statistically significant difference was found between male and female admissions in all three groups ($p>0.05$). There were 2,993 admissions before the pandemic, 1,801 during the pandemic, and 2,706 after the pandemic. Significant differences between the groups were found when compared with the diagnoses ($p<0.001$). The most common reason for admission was ADHD (n=1,766; 23.5%), followed by psychiatric evaluation (n=1,223; 16.3%) and childhood and adolescent onset problems (n=1,022; 13.6%). In the pre-pandemic period, admissions for medical documentation were very frequent, but they significantly decreased after the pandemic. Particularly, the diagnosis of childhood and adolescent onset problems was very low before and during the pandemic but dramatically increased after the pandemic. The diagnoses are presented in Table 1. The numbers of the major diagnostic categories are summarized in Supplementary Table 1.

Continuous variable

Age, number of admissions, and number of diagnoses were compared across all three periods. A statistically significant difference was found in age between the groups ($p=0.015$). When comparing the number of admissions and diagnoses, significant differences were observed in both cases ($p<0.001$). A post-hoc Tamhane test was applied to determine which group accounted for the differences between the groups. For age and number of diagnoses, no significant differences were found before and after the pandemic; however, during the pandemic, the age at admission significantly increased, while the number of diagnoses significantly decreased. The number of admissions consistently decreased from the pre-pandemic to the post-pandemic period, with statistically significant differences found in pairwise comparisons ($p<0.001$). The data are summarized in Table 2.

Trend of changes over the course of the pandemic

In the study, significant changes in hospital admission data were observed during the pandemic period. The diagnosis of ADHD decreased somewhat during the pandemic but showed an increase in the post-pandemic period. The diagnosis of issues typically seen in childhood and adolescence was nearly nonexistent before and during the pandemic, but it dramatically increased after the pandemic. Speech disorders, such as expressive language disorder, stuttering, and articulation disorders, were found to have decreased in the post-pandemic period compared to the pre-pandemic period. Visits for medical documentation also decreased during the pandemic and remained low afterward. In many healthcare systems, the validity periods of medical reports were extended and certain documentation requirements were temporarily suspended

Table 1. Hospital admission diagnoses over time according to ICD-10

Diagnosis	Pre-pandemic	During pandemic	Post-pandemic	Total
Psychosis (F29)	5 (0.1)	1 (0.0)	0 (0.0)	6 (0.1)
Mood disorder (F39)	5 (0.1)	2 (0.0)	1 (0.0)	8 (0.1)
Depression (F32)	31 (0.4)	13 (0.2)	13 (0.2)	57 (0.8)
Anxiety disorders (F41)	295 (3.9)	222 (3.0)	145 (1.9)	662 (8.8)
Generalized anxiety (F41.1)	7 (0.1)	3 (0.0)	5 (0.1)	15 (0.2)
Separation anxiety (Z63.5)	6 (0.1)	0 (0.0)	0 (0.0)	6 (0.1)
Other	2 (0.0)	0 (0.0)	0 (0.0)	2 (0.0)
Social anxiety (F40.10)	6 (0.1)	2 (0.0)	0 (0.0)	8 (0.1)
Selective mutism (F94.0)	1 (0.0)	0 (0.0)	1 (0.0)	2 (0.0)
Somatization (F45)	1 (0.0)	0 (0.0)	0 (0.0)	1 (0.0)
Eating disorders (F50)	3 (0.0)	0 (0.0)	1 (0.0)	4 (0.1)
Pica (F50.83)	2 (0.0)	0 (0.0)	0 (0.0)	2 (0.0)
Sleep disorders (G47)	12 (0.2)	2 (0.0)	0 (0.0)	14 (0.2)
Trichotillomania (F63.3)	1 (0.0)	0 (0.0)	4 (0.1)	5 (0.1)
Mild MR (F70)	13 (0.2)	0 (0.0)	0 (0.0)	13 (0.2)
Moderate MR (F71)	2 (0.0)	0 (0.0)	0 (0.0)	2 (0.0)
Severe MR (F72)	7 (0.1)	1 (0.0)	0 (0.0)	8 (0.1)
Typical ASD (F84.0)	13 (0.2)	6 (0.1)	13 (0.2)	32 (0.4)
Atypical ASD (F84.1)	70 (0.9)	56 (0.7)	60 (0.8)	186 (2.5)
ADHD (F90)	793 (10.6)	373 (5.0)	600 (8.0)	1,766 (23.5)
Learning disorders (F81)	102 (1.4)	55 (0.7)	4 (0.1)	161 (2.1)
ODD (F91.3)	55 (0.7)	2 (0.0)	46 (0.6)	103 (1.4)
Conduct disorder (F91)	29 (0.4)	3 (0.0)	1 (0.0)	33 (0.4)
Tic disorders (F95)	7 (0.1)	2 (0.0)	8 (0.1)	17 (0.2)
Childhood-onset disorders (F98.8-9)	1 (0.0)	0 (0.0)	1,021 (13.6)	1,022 (13.6)
Enuresis (F98.0)	6 (0.1)	3 (0.0)	1 (0.0)	10 (0.1)
Encopresis (F98.1)	4 (0.1)	1 (0.0)	1 (0.0)	6 (0.1)
Developmental delay (R62.0)	352 (4.7)	130 (1.7)	108 (1.4)	590 (7.9)
Other medical conditions (Z75.8)	35 (0.5)	10 (0.1)	6 (0.1)	51 (0.7)
Psychiatric evaluation (Z00.4)	234 (3.1)	465 (6.2)	524 (7.0)	1,223 (16.3)
PTSD-ASD (F43.1)	1 (0.0)	0 (0.0)	1 (0.0)	2 (0.0)
SUD (F10-19)	0 (0.0)	1 (0.0)	0 (0.0)	1 (0.0)
Medical documentation (R29.4)	475 (6.3)	312 (4.2)	13 (0.2)	800 (10.7)
Emotional/other	52 (0.7)	11 (0.1)	71 (0.9)	134 (1.8)
Speech disorders (unspecified) (F80.9)	2 (0.0)	1 (0.0)	4 (0.1)	7 (0.1)
Stuttering (F80.81)	31 (0.4)	5 (0.1)	6 (0.1)	42 (0.6)
Speech delay (F80.9)	61 (0.8)	22 (0.3)	15 (0.2)	98 (1.3)
Expressive language (F80.1)	140 (1.9)	63 (0.8)	21 (0.3)	224 (3.0)
Articulation (F80.0)	29 (0.4)	14 (0.2)	5 (0.1)	48 (0.6)
Total	2,993 (39.9)	1,801 (24.0)	2,706 (36.1)	7,500 (100)
Male	1,875 (62.6)	1,109 (61.6)	1,626 (60.1)	4,610 (61.5)
Female	1,118 (37.4)	692 (38.4)	1,080 (39.9)	2,890 (38.5)

Diagnosis between groups: χ^2=3195.310, df=82, p<0.001. Gender between groups: χ^2=3.937, df=2, p=0.140. ICD-10, 10th revision of the International Classification of Diseases; ASD, autism spectrum disorder; AHDH, attention-deficit/hyperactivity disorder; ODD, oppositional defiant disorder; PTSD, post-traumatic stress disorder; SUD, substance use disorder.

Table 2. Pre-pandemic, during pandemic, and post-pandemic comparisons in terms of age, number of admissions, and number of diagnosis

Variable	Mean±SD	Mean square	F	Sig.	Total df	Post-hoc Tamhane
Age	10.1±5.18	113.227	4.215	0.015*	7,499	During>Pre=Post
Number of admissions	2.68±2.42	421.670	73.23	<0.001*	7,499	Pre>During>Post
Number of diagnoses	1.39±0.77	29.541	50.859	<0.001*	7,499	Pre=Post>During

*one way analysis of variance. Sig, significant; df, degree of freedom.

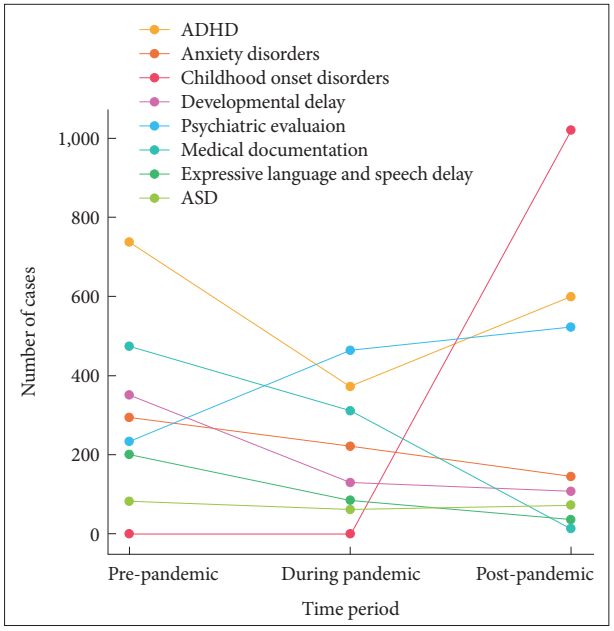


Figure 1. Distribution of diagnoses over pandemic periods. AHDH, attention-deficit/hyperactivity disorder; ASD, autism spectrum disorder.

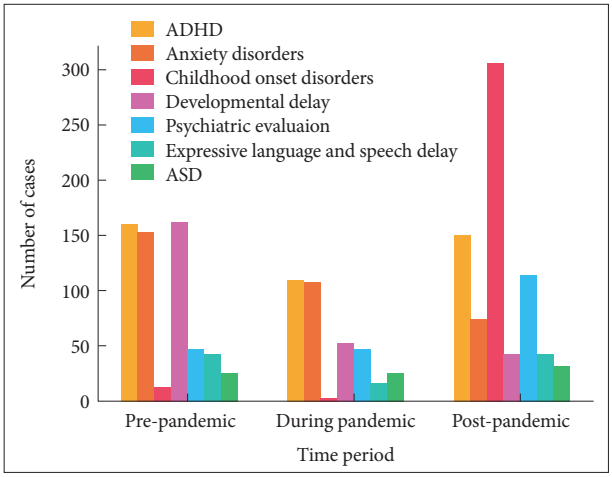


Figure 2. Secondary diagnoses during pandemic periods. AHDH, attention-deficit/hyperactivity disorder; ASD, autism spectrum disorder.

during and after the pandemic. We now explicitly note that these policy-level adjustments likely reduced the need for in-person visits solely for administrative or documentation purposes and may therefore have contributed to the observed decrease in such consultations. The diagnosis of psychiatric examination, however, increased significantly in the post-pandemic period compared to previous periods. The most frequent diagnoses during the pandemic and their temporal trends are shown in Figure 1. The secondary diagnoses received by the patients during this period were also included in the study. The trend followed by secondary diagnoses closely resembled that of primary diagnoses. However, a significant decrease was observed in the number of patients visiting the hospital for medical documentation. These changes in secondary diagnoses across pandemic periods are illustrated in Figure 2.

DISCUSSION

In this study, the admission diagnoses and variables such as age and gender of patients who visited the child psychiatry department before, during, and after the pandemic were examined. A statistically significant difference was found in the number of admissions before, during, and after the pandemic. A large-scale study conducted one year after the pandemic examined all hospital admissions in the United States and found a 45.4% decrease in pediatric patient admissions during the pandemic compared to the pre-pandemic period.[16] The same study found a decrease in psychiatric admissions. According to the general literature, it is stated that the pandemic worsened psychiatric disorders and led to the emergence of new psychiatric disorders.[17,18] However, it is noteworthy that the decrease in admissions due to anxiety disorders as a primary diagnosis continued even after the pandemic period. Although hospital admissions are not directly related to disease prevalence, this finding is intriguing.

It was observed that the number of ADHD admissions changed similarly for both primary and secondary diagnoses. The decrease in admissions during the pandemic slightly increased after the pandemic. This may be due to the general restrictions during the pandemic. A retrospective cohort study conducted in Finland found a significant increase in ADHD diagnoses throughout the pandemic.[19] The researchers in the Finnish study suggested that the increase in ADHD diagnoses could be attributed to the new lifestyle changes brought on by the pandemic, increased stress, and difficulties in accessing healthcare, which led to greater recognition and more diag-

noses. In our study, however, the number of admissions in the post-pandemic period was similar to that during the pandemic when evaluated within the total number of admissions. Overall, it was observed that the proportion of neurodevelopmental disorders in the total admissions remained relatively unchanged.

It was found that the diagnosis of other behavioral and emotional disorders with onset usually occuring in childhood and adolescence (F98) showed a significant change both in the pre-pandemic period and as a secondary diagnosis in the post-pandemic period. Because the subcategories of the F98 diagnosis (such as enuresis F98.0 and encopresis F98.1 or etc.) were observed at very low frequencies in the total presenting population (n=16), the diagnosis referred to here is F98.8 and F98.9. These diagnoses describe children who do not meet criteria for a specific psychiatric disorder but who present with psychiatric symptoms. The category encompasses a heterogeneous group of behavioral and emotional disturbances that typically begin during childhood or adolescence but do not meet the criteria for more well-defined disorders. These conditions may significantly impair social, academic, or familial functioning and often require clinical attention. This code contains subcategories as follow: F98.0 Nonorganic enuresis, F98.1 Nonorganic encopresis, F98.2 Feeding disorder of infancy and childhood, F98.4 Stereotyped movement disorders, F98.5 Stuttering, F98.6 Cluttering, F98.8 Other specified behavioral and emotional disorders with onset usually occurring in childhood and adolescence, F98.9 Unspecified behavioral and emotional disorders with onset usually occurring in childhood and adolescence. This diagnostic code, which was assigned very infrequently before the pandemic, increased dramatically in the post-pandemic period. In a case-control study conducted during the pandemic, the impact of lockdown measures on anxiety and depression levels in psychiatric patients and healthy controls was investigated. Although individuals with psychiatric disorders experienced greater deterioration compared to healthy controls, it was also found that anxiety and depression scores increased in the healthy control group.[20] Another study found that, in addition to increasing psychiatric diagnoses, the pandemic also heightened psychiatric distress, noting that even in the healthy population, symptoms such as anxiety, cognitive problems, and depressive complaints were observed.[21] The notable increase in this diagnosis, which was very limited before the pandemic, may reflect heightened anxiety and psychological distress related to the pandemic experience. A similar trend is also observed in comorbidities.

The COVID-19 pandemic has had profound and lasting effects on global mental health, leading to a significant increase in psychiatric distress in the post-pandemic period. Studies have consistently reported elevated levels of depression, anxiety, and insomnia among individuals recovering from COVID-19. For instance, a Swedish web-based survey found that 55% of participants experienced significant depression, 20.5% reported anxiety, and 60.9% suffered from insomnia following COVID-19 infection. The severity of the initial infection and subsequent post-COVID impairments, such as fatigue and cognitive dysfunction, were strongly associated with these mental health outcomes.[22] Similarly, a cross-sectional study conducted in Japan and Sweden revealed that individuals with post-COVID conditions exhibited higher incidences of depression (39.3%), generalized anxiety (24.4%), and post-traumatic stress disorder (50.4%) compared to those without such conditions.[23] However, as noted in these studies, many of the findings are based on symptom screenings rather than formal diagnoses. They do not necessarily meet the full diagnostic criteria (for example, generalized anxiety disorder requires symptoms to persist for at least 6 months). This ambiguity may help explain the increased number of psychiatric admissions observed in the post-pandemic period.

After the pandemic period, the number of psychiatric evaluations (Z00.4) has significantly increased. This may suggest that even in the absence of a formal psychiatric diagnosis, individuals continued to seek clinical consultations, indicating the presence of some subthreshold distresses. Prolonged social isolation and quarantine are known to cause feelings of loneliness, and for children and adolescents, the distance from peers can be anxiety-inducing. Concerns about the possibility of something happening to loved ones may have also influenced individuals to seek psychiatric consultations, even in the absence of a diagnosed psychiatric illness. In our study, a significant decrease was observed in the number of visits to the clinics for medical documentation, which is an expected outcome. Changes in previous processes and governmental operations during the pandemic, as well as the time required for life to return to normal in the subsequent period, may have led to a reduced need for bureaucratic procedures. During the pandemic, many new interactive applications, such as online services and remote education, were developed, which may have contributed to this decline.[24] Therefore, the number of hospital visits for obtaining documents may have decreased afterward.

There was a moderate decrease in admissions for speech delay and expressive language delay during the pandemic compared to the pre-pandemic period, while a partial decrease was observed in the post-pandemic period. As a secondary diagnosis, the admissions in the pre-pandemic and pandemic periods were found to be similar. In the literature, studies primarily focus on individuals who contracted COVID-19. Research indicates that children born during the pandemic exhibit significant delays in language development compared to their

pre-pandemic peers. A longitudinal study found that infants born during the pandemic consistently underperformed in language tasks up to 30 months of age, with no evidence of developed word segmentation abilities at 12 months and no successful word learning at 20 months.[25] Another study focuses on children who were receiving speech therapy and experienced disruptions due to the pandemic. A cohort study revealed that a 3-month interruption of language intervention programs during the pandemic led to a decline in language comprehension and overall language ability among children with language delays. However, resuming interventions post-interruption showed a significant increase in all language domains, emphasizing the importance of continuous support.[26] While it is believed that the restrictions during the pandemic led to isolation in children and caused delays in language and speech development, this relationship has not been conclusively demonstrated. Similarly, in this study, no direct correlation or significant increase was found. The speech delays observed during the pandemic appear to be more related to the inability to access healthcare services and other socioeconomic factors, rather than directly due to social restrictions. The pandemic has exacerbated existing social inequalities in language development. Children from lower socioeconomic backgrounds experienced more significant delays, partly due to limited access to resources and support systems. A study in Germany highlighted that while the prevalence of language delay decreased slightly overall, it increased among children from low socioeconomic status families.[27]

Hospital admissions related to autism spectrum disorder (ASD) remained unchanged throughout the pandemic. During the pandemic, there was a moderate decrease, followed by a similar increase in the post-pandemic period. Similarly, ASD also followed a similar pattern as a secondary diagnosis. Studies in the literature report varying results on this matter. A retrospective study conducted in a metropolitan hospital in Western Sydney analyzed hospital admissions for children with developmental disabilities, including ASD, before and after the implementation of COVID-19 lockdown policies. The study found a reduction in hospital presentations during the lockdown period. However, the average length of stay for admitted patients increased by approximately 1.5 times compared to the pre-lockdown period. This suggests that while fewer children with ASD were admitted to the hospital, those who were admitted had more severe conditions or faced delays in seeking care, leading to longer hospital stays.[4] An analysis of ED visits among children and youth aged 2–24 years in the United States revealed that while the total number of ED visits decreased during the pandemic, the proportion of visits involving patients with ASD increased. Specifically, autism-related ED visits rose from an annual count of 105,000 during 2016–2018 to 146,000 in 2019–2021. This represents a 51.3% increase in the proportion of autism-related visits relative to total youth ED visits. The study also noted that 38.7% of these visits involved comorbid psychiatric conditions, highlighting the complex healthcare needs of this population.[28] As observed in the literature, the shift in the number of admissions to the ED could explain the lack of change in the overall number of admissions. A direct relationship with the pandemic could not be established.

Public policy responses to COVID-19 have played a critical role in shaping mental health outcomes, as measures such as lockdowns, school closures, and mobility restrictions significantly altered social and psychological environments. While these policies were essential for infection control, evidence suggests they were also associated with increased mental health burdens, particularly among vulnerable groups including children, adolescents, and individuals with pre-existing psychiatric conditions. Consequently, integrating mental health considerations into pandemic-related public policy has been emphasized as a key priority to mitigate long-term psychological consequences and enhance societal resilience.

Limitations

Our study has some limitations. As with any retrospective database study, there is a risk of misclassification in the extraction of diagnoses. Although data from 7,500 pediatric and adolescent patients were accessed, only data from a single hospital was used. While repeated admissions with the same diagnosis were excluded, subgroups could not be fully separated. As a retrospective screening study, the amount of data that can be obtained is limited to what is available in the system. Therefore, sociodemographic variables could not be fully diversified. The study was conducted within the child and adolescent population and research in this area, particularly concerning mental health disorders, is limited. However, the need to keep certain information confidential according to national regulations may have also hindered access to sufficient data. This is not a longitudinal study and only examines trends in hospital admissions during pandemic period, so it is not possible to determine a direct causal relationship with the pandemic.

Conclusion

The results of this study indicate that during the pandemic, admissions for certain diagnostic categories decreased, while others showed a marked increase in the post-pandemic period. Notably, significant increases were observed in admissions related to other behavioral and emotional disorders with onset usually occurring in childhood and adolescence (F98), as well as psychiatric evaluations. These trends suggest that psychological distress persisted in the post-pandemic period and

that some individuals may have sought clinical consultation despite not meeting full diagnostic criteria, indicating the presence of subthreshold symptoms. These outcomes demonstrate that the effects of the pandemic were not limited to the acute phase but have had enduring impacts on child and adolescent mental health. In this context, enhancing the accessibility of mental health services and strengthening preventive and protective interventions, particularly for at-risk groups, is of critical importance. There are few similar trend studies about pandemic in the literature focusing on child and adolescent psychiatric disorders. No studies directly examining primary diagnoses and comorbidities have been found. Changes in hospital admissions during the pandemic, particularly in neurodevelopmental disorders or more severe mental illnesses (e.g., autism), suggest that there was no change in hospital admissions, but they may indicate an increase in externalizing problems. To determine a causal relationship, retrospective cohort studies or prospective follow-up studies are needed.

Supplementary Materials

The Supplement is available with this article at https://doi.org/10.30773/pi.2025.0338.

Availability of Data and Material

The datasets generated or analyzed during the study are not publicly available due to ethical restrictions, institutional data-protection policies, and the risk of participant re-identification but are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

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Funding Statement

None

Acknowledgments

We would like to thank all patients and their parents who agreed to participate in the study.

REFERENCES

1. Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. Lancet Psychiatry 2020;7:547-560.
2. Lam MH, Wing YK, Yu MW, Leung CM, Ma RC, Kong AP, et al. Mental morbidities and chronic fatigue in severe acute respiratory syndrome survivors: long-term follow-up. Arch Intern Med 2009;169:2142-2147.
3. Qiu J, Shen B, Zhao M, Wang Z, Xie B, Xu Y. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. Gen Psychiatr 2020;33:e100213.
4. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Netw Open 2020;3:e203976.
5. Siam MHB, Nishat NH, Ahmed A, Hossain MS. Stopping the COVID-19 pandemic: a review on the advances of diagnosis, treatment, and control measures. J Pathog 2020;2020:9121429.
6. Salazar de Pablo G, Vaquerizo-Serrano J, Catalan A, Arango C, Moreno C, Ferre F, et al. Impact of coronavirus syndromes on physical and mental health of health care workers: systematic review and meta-analysis. J Affect Disord 2020;275:48-57.
7. Deighton J, Lereya ST, Casey P, Patalay P, Humphrey N, Wolpert M. Prevalence of mental health problems in schools: poverty and other risk factors among 28 000 adolescents in England. Br J Psychiatry 2019;215:565-567.
8. Wang G, Zhang Y, Zhao J, Zhang J, Jiang F. Mitigate the effects of home confinement on children during the COVID-19 outbreak. Lancet 2020;395:945-947.
9. World Health Organization. Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. 2nd ed. Geneva: World Health Organization; 2013.
10. Sevincok D, Ozaydin Y, Ozgur BG, Ozbek MM, Aksu H, Sevincok L. The relationship between parental obsessive-compulsive disorder and children's cognitive disengagement syndrome (Sluggish Cognitive Tempo). Clin Child Psychol Psychiatry 2024;29:1448-1461.
11. Dalton L, Rapa E, Stein A. Protecting the psychological health of children through effective communication about COVID-19. Lancet Child Adolesc Health 2020;4:346-347.
12. Jiao WY, Wang LN, Liu J, Fang SF, Jiao FY, Pettoello-Mantovani M, et al. Behavioral and emotional disorders in children during the COVID-19 epidemic. J Pediatr 2020;221:264-266.e1.
13. Bonello F, Zammit D, Grech A, Camilleri V, Cremona R. Effect of COVID-19 pandemic on mental health hospital admissions: comparative population-based study. BJPsych Open 2021;7:e141.
14. Volkow ND. Collision of the COVID-19 and addiction epidemics. Ann Intern Med 2020;173:61-62.
15. Ambrosetti J, Macheret L, Folliet A, Wullschleger A, Amerio A, Aguglia A, et al. Psychiatric emergency admissions during and after COVID-19 lockdown: short-term impact and long-term implications on mental health. BMC Psychiatry 2021;21:465.
16. Pelletier JH, Rakkar J, Au AK, Fuhrman D, Clark RSB, Horvat CM. Trends in US pediatric hospital admissions in 2020 compared with the decade before the COVID-19 pandemic. JAMA Netw Open 2021;4:e2037227.
17. Salari N, Hosseinian-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, 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;16:57.
18. Guessoum SB, Lachal J, Radjack R, Carretier E, Minassian S, Benoit L, et al. Adolescent psychiatric disorders during the COVID-19 pandemic and lockdown. Psychiatry Res 2020;291:113264.
19. Auro K, Holopainen I, Perola M, Havulinna AS, Raevuori A. Atten-

tion-deficit/hyperactivity disorder diagnoses in Finland during the COVID-19 pandemic. JAMA Netw Open 2024;7:e2418204.
20. Hao F, Tan W, Jiang L, Zhang L, Zhao X, Zou Y, et al. Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry. Brain Behav Immun 2020; 87:100-106.
21. Chua SE, Cheung V, McAlonan GM, Cheung C, Wong JW, Cheung EP, et al. Stress and psychological impact on SARS patients during the outbreak. Can J Psychiatry 2004;49:385-390.
22. Badinlou F, Lundgren T, Jansson-Fröjmark M. Mental health outcomes following COVID-19 infection: impacts of post-COVID impairments and fatigue on depression, anxiety, and insomnia - a web survey in Sweden. BMC Psychiatry 2022;22:743.
23. Matsumoto K, Hamatani S, Shimizu E, Käll A, Andersson G. Impact of post-COVID conditions on mental health: a cross-sectional study in Japan and Sweden. BMC Psychiatry 2022;22:237.
24. Al-Garadi MA, Khan MS, Varathan KD, Mujtaba G, Al-Kabsi AM. Using online social networks to track a pandemic: a systematic review. J Biomed Inform 2016;62:1-11.
25. Pejovic J, Severino C, Vigário M, Frota S. Prolonged COVID-19 related effects on early language development: a longitudinal study. Early Hum Dev 2024;195:106081.
26. Hsu SC, Wong AM. Association between interruption of intervention and language performance in young children with language delay-a cohort study during COVID-19 pandemic. Front Pediatr 2023;11: 1240354.
27. Hoffmann S, Tschorn M, Spallek J. Social inequalities in early childhood language development during the COVID-19 pandemic: a descriptive study with data from three consecutive school entry surveys in Germany. Int J Equity Health 2024;23:2.
28. Rizvi A, Husain K, Ashraf S, Trivedi C, Jain SB, Safwi SR. Trend in emergency department visits among children and youth with autism spectrum disorder: a cross-sectional analysis of the National Hospital Ambulatory Medical Care Survey, 2016-2021. Prim Care Companion CNS Disord 2024;26:24br03776.