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Evaluation of child and adolescent psychiatry outpatient clinic admissions during the COVID-19 pandemic

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ABSTRACT

Objective: This study aimed to retrospectively evaluate the changes in volume and diagnostic profile of outpatient admissions to a university hospital's Child and Adolescent Psychiatry Clinic during the COVID-19 pandemic, by comparing data from the pre-pandemic period and the first year of the pandemic.

Material and Methods: Admissions made between March 2019–February 2020 (pre-pandemic) and March 2020–February 2021 (pandemic) to the Child and Adolescent Psychiatry Department of Hacettepe University were analyzed. Number of admissions, frequency, age and gender distribution, and ICD-10 diagnostic categories were compared. In addition, referral rates from pediatric emergency, general pediatrics, and adolescent medicine units were examined. Data were retrospectively obtained from patient files and analyzed using SPSS 20.0.

Results: There was a 19% decrease in the total number of outpatient admissions during the pandemic. However, no significant difference was found in the number of new admissions. The mean age of children was significantly higher in the pandemic period ($p<0.001$). No significant difference was found in gender distribution. During the pandemic, the proportion of anxiety disorders increased significantly ($p=0.001$), whereas rates of specific learning disorders ($p<0.001$), decreased.

Conclusion: Findings indicate a qualitative shift in child and adolescent mental health service use during the pandemic, with increase in anxiety disorders and decrease in specific learning disorder.

Keywords: Adolescent psychiatry, child psychiatry, COVID-19, diagnostic distribution, pandemic, outpatient applications

INTRODUCTION

The COVID-19 pandemic has emerged a significant challenge to healthcare systems worldwide and has profoundly impacted the mental well-being of societies. Fear of disease, uncertainty of the quarantine duration, financial problems increase the risk of adverse psychological effects. The social isolation and school closures, caused increased loneliness in children and adolescents. Studies have shown that one-third of adolescents have high levels of loneliness during the COVID-19 pandemic and there is a known relationship between loneliness and mental health. Besides, disruption of daily routines caused frustration among developmentally vulnerable groups such as children with special education needs (1–4).

Studies conducted during this period have reported an upsurge in depression, anxiety, sleep disorders and post-traumatic stress symptoms among children and adolescents (5-10). In a cross-sectional study conducted among Chinese adolescents during pandemic, prevalence of depressive symptoms was 43,7%, anxiety symptoms was 37,4% and a combination of depressive and anxiety symptoms was 31,3%. Also, female gender and higher grade were higher risk factor for depressive and anxiety symptoms (7). In another study conducted in Italy and Spain, parents reported behavioral changes in their children. The most frequent symptoms were irritability, boredom, nervousness, difficulty in concentration, loneliness and restlessness (8). There are also findings indicating a decrease in externalization disorders during the pandemic. Bobo et al. (11) reported that most children and adolescents with ADHD experience stability or improvement of their well-being which may be related to less school-related strain and flexible schedules. However, most of the available data are cross-sectional and therefore insufficient

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to monitor the long-term impact of the pandemic on the mental health of children and adolescents (9, 10). In addition, there are a limited number of studies comparatively evaluating the pre-pandemic and pandemic periods in Türkiye (12).

In this context, supporting the evaluation of the impact of the pandemic on mental health services with local data is of great importance for both planning health services and developing targeted intervention strategies in times of crisis.

This study retrospectively examined how outpatient psychiatric admissions to the child and adolescent psychiatry clinic of a university hospital differed in terms of diagnosis, number of admissions, age and gender between the pre-pandemic and pandemic periods.

The primary aim of this study was to evaluate the impact of the COVID-19 pandemic on outpatient referrals to a child and adolescent psychiatry clinic. In line with this objective, the following hypotheses were tested:

- The total number of outpatient visits during the pandemic period differs significantly compared to the pre-pandemic period.
- The number of patients referred by other services increased during the pandemic period.
- An increase in internalizing disorders and a decrease in externalizing disorders are expected during the pandemic period.

METHODS

The period from March 2019 to February 2020 was defined as the pre-pandemic period, while the period from March 2020 to February 2021 was defined as the pandemic period. The study period encompassed the national lockdown measures in Türkiye, including school closures (initially complete between March and June 2020 with intermittent re-openings and subsequent closures during the 2020–2021 academic year), restrictions on social activities, curfews and stay-at-home orders, as well as reduced access to outpatient psychiatric services.

Data were retrospectively obtained from the hospital information management system of the Hacettepe University Department of Child and Adolescent Psychiatry, between June 2021 and February 2022. The sample size before the pandemic was 15255, while during the pandemic it was 12374. The variables examined included the date of admission, age, gender, diagnostic information based on ICD-10 codes, status as a new or follow-up visit, and referrals from the pediatric emergency, pediatrics, and adolescent health units.

Diagnoses were made by specialist clinicians based on clinical interviews and evaluations conducted during outpatient visits and were recorded in the electronic system using ICD-10 diagnostic codes. In reviewing the patient records, not only the diagnostic codes but also clinicians' written notes were taken into account.

Statistical analysis

Statistical analysis were performed using IBM Statistical Package for the Social Sciences, version 20.0 (SPSS Inc., Armonk, NY, IBM Corp., USA). This study utilized a descriptive data analysis approach to summarize and interpret the colllected data. For numerical data, the mean and standard deviation were used for data following a normal distribution. Percentages and frequencies were used for categorical data. Chi-square tests were used for categorical variables, and independent samples t-tests were applied for continuous variables. Bonferroni corrected chi-square tests were applied as post hoc tests. A p-value of <0.050 was considered the threshold for statistical significance.

RESULTS

Before the pandemic, a total of 15255 admissions were made to the outpatient clinic, while this number decreased to 12374 during the pandemic period; this shows that there was a 19% decline in admissions.

After excluding repeated visits, the total number of patients presenting to the outpatient clinic was 4353 in the year preceding the pandemic (March 2019–February 2020) and 5028 during the pandemic period (March 2020–February 2021), which is not significantly different ($p>0.050$). Among these, the number of new patient visits was 2093 in the pre-pandemic year, whereas 1947 of the visits during the pandemic were identified as new consultations. There was no significant difference in the number of new admissions ($p=0.068$).

The mean age of the patients was 10.4±4.2 prior to the pandemic and 10.9±4.5 during the pandemic, with the difference found to be significantly higher ($p < 0.001$). No significant difference was found in terms of gender distribution, with male gender prevailing in both periods [female vs. male; 39.2 % vs. 60.8 % (pre-pandemic) ; female vs. male; 38.4 % vs. 61.6 % (pandemic); $p=0.430$]

Table I: Distribution of patient admissions before and during the COVID-19 pandemic

	Pre-pandemic	During pandemic
Pediatric Emergency		
Admission frequency	45131	25331
Referral rates	0.49 %	0.85%
Pediatrics		
Admission frequency	12168	5873
Referral rates	16.6 %	19.2%
Adolescent Health		
Admission frequency	2466	1367
Referral rates	30.4 %	35.5 %

Table II: Distribution of diagnoses before and during the COVID-19 pandemic

Diagnoses	Pre-pandemic*	During pandemic*	p†
Total Number of Patients	4353	5028	-
ADHD	1711 (39.3)	1868 (37.2)	0.078
Anxiety Disorder	339 (7.8)	494 (9.8)	0.001
ASD	361 (8.3)	432 (8.6)	0.064
Specific Learning Disorder	377 (8.7)	269 (5.4)	0.001
Major Depressive Disorder	188 (4.3)	211 (4.2)	0.798
Intellectual Disability	194 (4.5)	178 (3.5)	0.089
Developmental Speech and Language Disorder	78 (1.8)	97 (1.9)	0.577
OCD	82 (1.9)	77 (1.5)	0.385
Eating Disorder	54 (1.2)	75 (1.5)	0.056
Tic Disorder	42 (1.0)	54 (1.1)	0.861
Enuresis - Encopresis	38 (0.9)	23 (0.5)	0.063
PTSD	11 (0.3)	23 (0.5)	0.079
Conduct Disorder & ODD	8 (0.2)	21 (0.4)	0.247
Bipolar Affectxve Disorder	15 (0.3)	19 (0.4)	0.081
Gender Dysphoria	9 (0.2)	12 (0.2)	0.097

***:** *n(%),*†**:** *Bonferroni corrected chi-square tests,* ***ADHD:** Attention Deficit Hyperactivity Disorder;* ***ASD:**Autism Spectrum Disorder;* ***OCD:** Obsessive-Compulsive Disorder;* ***PTSD:** Post-traumatic Stress Disorder;* ***ODD:** Oppositional Defiant Disorder*

Referrals from pediatric emergency, pediatrics and adolescent health units to child and adolescent psychiatry outpatient clinics have increased significantly during the pandemic period. The distribution of the admissions before and during the pandemic period according to the departments and the referral rates to the child and adolescent psychiatry outpatient clinics are shown in Table I.

In terms of diagnosis distribution, there was a significant increase in anxiety disorder diagnoses (p=0.001) and a significant reduction in attention deficit hyperactivity disorder (ADHD) (p=0.033), specific learning disorder (p<0.001) and intellectual disability (p=0.026) diagnoses during the pandemic period. After Bonferroni correction, anxiety and specific learning disorders maintained their significance (both of them, p=0.001); intellectual disability and ADHD were not found to be statistically significant (p=0.089, p=0.078). No significant difference was observed in diagnoses such as eating disorders, obsessive-compulsive disorder (OCD) and depression. This finding, consistent with some international studies, suggests that the expected increase was not observed and that the admission rates of these diagnoses may have remained stable under pandemic conditions. The distribution of the admissions before and during the pandemic according to diagnoses is presented in Table II.

A detailed analysis of the referrals diagnosed with eating disorders revealed no statistically significant difference between new and follow-up visits during the pandemic period (new vs. follow-up; n= 33 vs. n=42) compared to the pre-pandemic period (new vs. follow-up; n= 25 vs. n=29) (p = 0.056). Notably, the result obtained in the eating disorder analysis is very close to the significance threshold, indicating a possible upward trend in this diagnostic group (χ^2=1.15; p=0.056). This should be clinically considered and monitored through follow-up studies.

In contrast, for anxiety disorders, a significant difference was observed between new and follow-up visits during the pandemic (new vs. follow-up; n= 220 vs. n=274) compared to the pre-pandemic period (new vs. follow-up; n= 212 vs. n=127) (p<0.001), which was primarily attributable to an increase in follow-up visits.

Regarding attention-deficit/hyperactivity disorder (ADHD), a significant difference was found between new and follow-up visits during the pandemic (new vs. follow-up; n= 350 vs. n=1518) compared to the pre-pandemic period (new vs. follow-up; n= 641 vs. n=1070) (p< 0.001), driven by both a reduction in new visits and an increase in follow-up consultations.

For specific learning disorders, a significant difference was observed between new and follow-up visits during the pandemic (new vs. follow-up; n= 37 vs. n=232) compared to the pre-pandemic period (new vs. follow-up; n= 109 vs. n=268) (p < 0.001), which was primarily associated with a decrease in new visits.

For intellectual disability, however, no statistically significant difference was found between new and follow-up visits during the pandemic (new vs. follow-up; n= 57 vs. n=121) compared to the pre-pandemic period (new vs. follow-up; n= 65 vs. n=129) (p = 0.073).

DISCUSSION

The COVID-19 pandemic has triggered numerous psychopathologies in children and adolescents, both due to the direct effects of infection and the difficulties created by the limitations taken against infection. In the early stages of the outbreak, one-third of parents (35.1%) reported that their children's psychological health had been significantly affected (13). Additionally, nationwide studies in the US have reported that children and adolescents' psychological well-being and behavioral health have deteriorated compared to before the pandemic (5,14). Numerous studies investigating the impact of the COVID-19 pandemic and related control measures on children and adolescents with autism spectrum disorder have reported a significant increase in parental stress, as well as high levels of anxiety, irritability, hyperactivity, stereotypical behavior, and other behavioral problems in children and adolescents (14). The findings obtained in our study provide significant insights for the clinical evaluation of the impact of the COVID-19 pandemic on child and adolescent mental health. While a decrease was observed in the total number of admissions during the pandemic period, after excluding the repeated visits, there was no significant difference between pre-pandemic and pandemic

period. The rate of new admissions remained stable, which is noteworthy. This situation indicates that despite the pandemic, individuals experiencing psychological distress continued to seek access to healthcare services.

A closer examination of the consultations conducted before and during the pandemic revealed a marked increase in referral rates to the child and adolescent psychiatry unit among the three main departments of the pediatric hospital. Based on this finding, it can be inferred that the quantitative burden of mental health symptoms and disorders observed in our clinic escalated during the pandemic period. Although there was a sharp decline in the overall number of healthcare visits during this time, a substantial proportion of the remaining consultations required referral to the child and adolescent psychiatry outpatient clinic.

The increase in anxiety disorder rates has been observed not only in this study but also in research conducted by Ravens-Sieberer et al. (15) in Germany, Patrick et al. (5) in the United States, and Racine et al. (9) in Canada. This suggests that the effects of the pandemic—such as uncertainty, loneliness, isolation, and traumatic stress—have manifested in similar mental health symptoms globally among children and adolescents. Additionally, the rise in follow-up visits among individuals with anxiety disorders supports the notion that pre-existing mental health conditions were exacerbated under pandemic conditions.

There was no statistically significant difference in total number of ADHD diagnoses between pre-pandemic and pandemic period. In France, Bobo et al. found that parents reported a decrease in ADHD symptoms of their children. This decline could be caused of reduced academic demands at home, diminished pressure from structured classroom environments and parent's less pronounced observation of their children's attention problems (11). On the other hand, a review study suggested that this decline may be related to remote learning not allowing the teacher to recognize ADHD and refer the family, rather than a true reduction in symptoms (14). Conditions like ADHD cause functional impairments in the lives of children and their families, leading to increased difficulties during the pandemic due to reduced treatment-seeking. Therefore, in similar circumstances, ensuring access to services for these children should be a priority.

A significant decrease was observed in the diagnosis of specific learning disorder. Possible reasons for this decline include the limited scope of teacher observations during online education, delays in diagnostic procedures, and the automatic extension of report durations for individuals with existing diagnoses during the pandemic period (15). Since the beginning of the pandemic, it was reported that many state school districts postponed assessments to determine for early intervention or special education services, resulting in long waiting lists (17). Teachers may be less likely to refer students for assessment during remote learning due to reduced opportunities for in-class observation (17). Delays in diagnostic procedures can lead to more pronounced learning difficulties and reduced academic achievement in subsequent years. Such children should not be overlooked, and that in similar situations, regular screenings for attention-deficit/hyperactivity disorder and specific learning disorder should be conducted, with families and educators appropriately informed.

There was no statistically significant difference in the diagnoses of ASD and intellectual disability. In a UK study of parents of children with special educational needs, most parents and children reported experiencing loss, worry and changes in mood and behaviour during the pandemic (18). In another study, worsening of any child neurodevelopmental disorder or comorbid mental health symptom was reported by 64,5% of respondents and almost one fifth of families reported an increase in the dosage of medication administered to their child (19). Children with neurodevelopmental disabilities may be particularly vulnerable to stress due to significant changes in routines and service access. Improved access to and coordination of health services as well as targeted interventions for these children and families should be conducted.

No significant increase was observed in the diagnoses of eating disorders and depression. However, several studies have reported expectations of an increase in these diagnoses, particularly among adolescent girls during the pandemic period (9,10,20-22). This finding suggests that the sample may have been limited to referrals from outside urban areas, or that presentations of eating disorder cases may have been delayed due to physical restrictions.

Similarly, no significant difference was found regarding obsessive-compulsive disorder (OCD). This finding aligns with the heterogeneous results reported in a systematic review. Among the 42 studies examined by Luginaah et al. (23), 30 reported exacerbation of OCD symptoms during the pandemic, while 12 observed no changes. This suggests that individual and familial resilience may play a determining role.

Finally, the increase in referrals from pediatric emergency, pediatrics, and adolescent health units to psychiatry indicates that the indirect effects of the pandemic should not be overlooked. The identification of children presenting with psychiatric symptoms in pediatric units and their subsequent referral to child psychiatry underscores the importance of collaborative care services.

Limitations

One of the strengths of this study is the comparative analysis of pre-pandemic and pandemic period referrals within the same institution, using a consistent medical record system and diagnostic approach. Furthermore, the inclusion of not only the number of referrals but also variables such as age, gender, and diagnostic distributions allows for a more comprehensive evaluation.

However, the study has several limitations. It is a single-center study, and the findings may not be generalizable to other institutions or geographic regions. Also, when considering 20% decrease in admissions, the effect of lockdown period of 3-4 months during the study should be taken into account

as a limitation. In addition, variables such as socioeconomic status, parental education level, and regional differences were not included. The exclusion of these factors limits the ability to fully understand the underlying reasons for changes in referral patterns.

Due to its retrospective design, the accuracy of diagnoses relies solely on clinical interviews and ICD-10 coding. Standardized diagnostic tools or structured interviews were not used in the diagnostic process, which limits the ability to assess diagnostic validity.

Moreover, despite the widespread adoption of remote healthcare services—particularly telepsychiatry—during the pandemic, such consultations were not included in the present study. This may have led to an underestimation of the actual number of psychiatric referrals.

CONCLUSION

The COVID-19 pandemic has led to both quantitative and qualitative changes in outpatient visits to child and adolescent psychiatry clinics. A significant increase was observed in anxiety disorders, whereas a notable decrease was seen in specific learning disorder. Despite an overall decline in the number of visits, the rate of new admissions remained stable, indicating a continued pursuit of mental health support. Particular attention should be given to strengthening accessible psychosocial support services for adolescents with anxiety disorders and children with special educational needs should not be overlooked.

Future research should be supported by more comprehensive, multicenter studies that include the effects of socioeconomic factors, parental attitudes, remote education, and telepsychiatry applications. In particular, holistic models that strengthen collaboration among children, families, and schools should be developed to enhance the recognition and intervention of mental disorders.

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Ethics committee approval

This study was conducted in accordance with the Helsinki Declaration Principles. The study was approved by Hacettepe University (26.05.2021 , reference number: GO21/669).

Contribution of the authors

Study conception and design: CA, KN, FÇÇ; Data collection: ST; Analysis and interpretation of results: CA, ST, KN, FÇÇ; Draft manuscript preparation: CA; All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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