# The comparison of application profile to child psychiatry outpatient clinic before and during the COVID-19 pandemic and the effect of the pandemic on emotional-behavioral problems in children

## *COVID-19 pandemisi öncesi ve sırasında çocuk psikiyatrisi polikliniğine başvuru profilinin karşılaştırılması ve pandeminin çocuklarda duygusal-davranışsal sorunlar üzerine etkisi*

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**SUMMARY**

**Objective:** This study aimed to investigate the effects of the COVID-19 pandemic and the measures taken in our country on application profile to the child psychiatry clinic. **Method:** In our study, the file data of the cases aged 0-18 years who applied to our clinic for the first time during the pandemic period (between 1st of April and 1st of august 2020) were retrospectively scanned, and they were compared with the file data of cases applying for the first time between the same dates of the previous year. As part of the evaluation, the data of the Strengths and Difficulties Questionnaire (SDQ) Parent form, which was filled out by the parents of all children between the ages of 6 and 16 who applied to our clinic for the first time, were also analyzed. **Results:** The data of 707 children and teenagers were examined in our study. It was found that the application rate of school-aged children decreased significantly during the pandemic period ($p < 0.05$). The rate of Anxiety Disorders (13.2%) showed a significant increase in the cases applied during the pandemic ($p < 0.05$). The total difficulty score of SDQ was found to be significantly higher in cases with the application at the time of pandemic compared to cases that applied at the same time of the previous year. The total difficulty scores of SDQ were respectively 15.98 ± 5.63, 13.87 ± 6.64 ($p < 0.05$). **Discussion:** : Our findings have shown that the pandemic and the measures taken for it are the reasons for changes in the practice of child psychiatry clinics.

**Key Words:** Child psychiatry, clinic, COVID 19, pandemic, mental health

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**ÖZET**

**Amaç:** Bu çalışmada, COVİD-19 pandemisi ve ülkemizde uygulanan tedbirlerin bir çocuk psikiyatrisi kliniğine başvuru profili üzerine etkisini araştırılması amaçlanmıştır. **Yöntem:** Çalışmamızda, pandemi dönemine denk gelen (01 Nisan-01 Ağustos 2020) tarihlerde kliniğimize ilk kez başvuran 0-18 yaş arası olguların dosya verileri geriye dönük olarak taranmış, bir önceki yılın aynı tarihleri arasında ilk kez başvuran olguların dosya verileri ile karşılaştırılmıştır. Değerlendirmenin bir parçası olarak kliniğimizde 6-16 yaş arası ilk kez başvuran tüm çocukların ebeveynlerine doldurtulan Güçler Güçlükler Anketi (GGA) Anne Baba formu verileri de analiz edilmiştir. **Bulgular:** Çalışmamızda 707 çocuk ve ergenin verileri incelenmiştir. Okul çağı çocuklarının başvuru oranının pandemi döneminde anlamlı olarak azaldığı saptanmıştır ($p<0.05$). Yine pandemi sırasında başvuran olgularda Kaygı Bozuklukları (%13.2) oranı anlamlı artış göstermiştir ($p<0.05$). GGA toplam güçlük puanı pandemi döneminde başvuran olgularda bir önceki yılın aynı tarihlerinde başvuran olgulara göre anlamlı düzeyde daha yüksek saptanmıştır. GGA toplam güçlük puanları sırasıyla 15.98±5.63, 13.87±6.64 idi ($p<0.05$). **Sonuç:** Bulgularımız pandemi ve alınan önlemlerin çocuk psikiyatrisi klinik pratiğinde değişikliklere neden olduğunu göstermiştir.

**Anahtar Sözcükler:** Çocuk psikiyatrisi, klinik, COVID 19, pandemi, ruh sağlığı


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## INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is a newly discovered ribonucleic acid coronavirus isolated from patients with unexplained pneumonia in Wuhan, China, in December 2019(1). The COVID-19, spreading rapidly to other parts of the world, has been declared a pandemic by the World Health Organization (WHO) on 11th ofMarch, 2020(2). Therefore, many countries have implemented various measures like quarantine practices, banning collective events, staying at home, working as much as possible from home to slow down the spread of the virus(3). The measures restricting human movement have been taken to fight the COVID-19 after the first case in Turkey on the 11th of March, 2020. Some of these measures are suspension on face-to-face education and imposing lockdown to under the age of 20(4). Because of these decisions, children stay at home for a long time, their physical activities have been reduced, and social communication with their classmates and teachers has been restricted. It has been stated that the COVID-19 pandemic causes an increase in the frequency of symptoms such as anxiety, depression, post-traumatic stress disorder, insomnia, anger, and disappointment in the literature(5,6). For instance, the prevalence of depression and anxiety during the pandemic period was found to be 43.7% and 37.4% in a study of 8079 teenagers between the ages of 12 and 18(7). However, it is clear that more studies are needed for children's emotional and behavioral responses to rarely seen events like pandemics.

This study aims to investigate patients who applied to our clinic for the first time between 1st of April and 1st of August 2020 in terms of age, gender, diagnosis, comorbidity, and used medicine by comparing them with the same dates of 2019 and to analyze the effect of the COVID-19 pandemic on the application profile to a child psychiatry clinic.

## METHOD

### Participants and Procedure

The files of 707 cases aged between 0 and 18 who applied to our clinic for the first time between 1st of April and 1st of August, 2019 and the data from the year 2020 were scanned retrospectively in terms of age, gender, diagnosis, comorbidity, and the medicine used. Cases with missing file information and/or not completing the evaluation process were excluded from the study.

DSM-5 diagnostic system was used to evaluate the cases who applied to our clinic for the first time. Diagnosis was supported by psychometric tools required contrary to the psychiatric examination in the evaluation made. The Strengths and Difficulties Questionnaire (SDQ) Parent form was routinely filled by parents of all children aged between 6 and 16 who applied to our clinic for the first time as a part of the evaluation. On the other hand, in the cases under the age of 6, a standard questionnaire was not used in the evaluation due to the differences in approaches of the child and adolescent psychiatrists working in our clinic. The ages, genders, psychiatric diagnoses, comorbidities, and medicine of each case were recorded.

In our study, the term "before the pandemic" was used for the dates between 1st of April and 1st of August 2019 and "the pandemic period" for the dates between 1st of April and 1st of August 2020.

### Data Collection Tools

***Strengths and Difficulties Questionnaire (SDQ):***It is a questionnaire developed to screen mental problems in children and young agers. This questionnaire also has a parent form and a teacher form for ages between 4 and 16, and a teenager form for ages between 11 and 16 that they fill out by themselves. This questionnaire also has both hand-signed and computer-filled versions. SDQ includes 25 questions examining the behavioral characteristics, which are positive and negative. These questions are grouped under five subtitles. These titles are conduct problems, inattention and hyperactivity, emotional problems, peer problems, and prosocial behavior. The sum of the first four titles gives the "total difficulty score" when each title is evaluated within itself. High scores in prosocial behavior reflect the strong ways of the individual in the social area as well as high scores in the other four areas (conduct problems, attention deficit, and hyperactivity, emotional problems, peer problems)

reflect the intension of the problem areas. Besides, the impact score determining the level of individual exposure to mental difficulties can be calculated from the scale. Higher impact scores indicate that mental difficulties affect the individual more (8). Turkish validity and reliability were done by Güvenir et al. (9).

### Statistical Analysis

The data obtained from the research were evaluated by using IBM SPSS statistics software version 25.0. The variables obtained with measurement were identified as mean ± standard deviation and categorical variables as percentages and numbers. Chi-square analysis was used in the comparison of categorical variables. The Kolmogorov-Smirnov test was used to evaluate whether the numerical variables were normally distributed. The student's t-test was used for normally distributed results, and the Mann-Whitney U test was used for results that did not show normal distribution in comparing scale scores between groups. Correlations were calculated by Spearman rank correlation analysis, and $p < 0.05$ was accepted as the statistical significance limit.

## RESULTS

Four hundred seventy-three of the cases applied before the pandemic and 234 during the pandemic period included in the study. No statistically significant difference was found in comparing the cases applied before and during the pandemic period according to their age (U= 51344.5, p= 0.118) and gender ($x^2 = 0.003$, $p = 0.957$). However, statistical significance was found in the comparison of childhood periods. According to this result, it was observed that the application rate of children in pre-school period ($x^2= 6.036$, $p = 0.014$) and adolescence ($x^2= 27.219$, $p < 0.001$) increased significantly during the pandemic period. It was determined that the application rate of children in school-age ($x^2= 45.205$, $p < 0.001$) decreased significantly during the pandemic period.

SDQ Parent form was filled by parents of all children between the ages of 6 and 16 applying for the first time in our clinic as part of the evaluation. There was no statistical significance between the groups related to whether the parent filling out the questionnaire was a mother or father. The statistical evaluation of the parents' education levels who filled out the questionnaire was also made in the study. According to this, it was seen that only the application rate of parents at the primary education level increased significantly during the pandemic period ($x^2=6.335$, $p=0.012$). The general characteristics of the participants are given in Table 1.

The diagnosis distributions were evaluated according to DSM-5 in our study. The three most common diagnoses made in pre-pandemic cases were respectively Attention Deficit Hyperactivity Disorder (ADHD) with a rate of 26.0%, Specific Learning Disorder (SLD) with a rate of 13.7%, and Intellectual Disabilities (ID)with a rate of 10.4%. In cases applied during the pandemic period, the three most common diagnoses were respectively Anxiety Disorders (13.2%), ADHD (12.8%), and Communication Disorders (10.3%). The application rates of ADHD ($x^2=16.046$, $p<0.001$) and SLD ($x^2=25.737$, $p <0.001$) cases were found to be decreased significantly in the pandemic period compared to the pre-pandemic period.While the diagnosis of Anxiety Disorders ($x^2=3.978$, $p= 0.046$), Obsessive-Compulsive Disorders and Related Disorders ($x^2=18.150$, $p <0.001$), Disruptive, Impulse Control and Conduct Disorders ($x^2 =11.978$, $p = 0.001$) increased signi-

**Table 1: General characteristics of the participants according to the application periods.**

| | | Application Periods | | | |
|---|---|---|---|---|---|
| | | Before the pandemic N(%) | During the pandemic N(%) | Statistics (U/ $x^2$) | *p* |
| Age | | 8.29 (–3.84) | 9.31 (–5.15) | 51344,5 | 0.118[a] |
| Gender | Female | 187 (39.5) | 93 (39.7) | 0.003 | 0.957[b] |
| | Male | 286 (60.5) | 141 (60.3) | | |
| Period | Pre-school | 131 (27.7) | 86 (36.8) | 6,036 | 0.014[b] |
| | School age | 258 (54.5) | 65 (27.8) | 45,205 | <0.001[b] |
| | Adolescence | 84 (17.8) | 83 (35.5) | 27,219 | <0.001[b] |
| Parents filling out SDQ* | Mother | 272 (83.4) | 95 (81.2) | 0.304 | 0.582[b] |
| | Father | 54 (16.6) | 22 (18.8) | | |
| Education level of Parents filling out SDQ * | Primary school | 162 (49.7) | 74 (63.2) | 6.335 | **0.012[b]** |
| | High school | 108 (33.1) | 31 (26.5) | 1.759 | 0.185[b] |
| | University | 56 (17.2) | 12 (10.3) | 3.174 | 0.105[b] |

*Includes only 6-16 age group
[a]Mann-Whitney U
[b]Pearson ki kare

ficantly during the pandemic period (Table 2).

Considering our findings, it was determined that anxiety disorders showed a significant increase in cases who applied during the pandemic period. Therefore, statistical analyses for anxiety disorders were also done. In the cases applying before the pandemic, Separation Anxiety Disorder (SAD) rate was %12.5 (n=5), Selective Mutism(SM) rate was %7.5 (n=3), Social Anxiety (SA) was %30.0 (n=12), Panic Disorder (PD) rate was % 12.5 (n=5), Specific Phobia (SP) rate was %12.5 (n=5) and Generalized Anxiety Disorder (GAD) rate was %25.0 (n=10) in the anxiety disorders. On the other hand, these rates were respectively 9.7% (n = 3), 19.4% (n = 6), 6.5% (n = 2), 16.1% (n = 5) and 48.4% (n = 15) for SAD, SA, PD, SP and GAD in the cases who applied during the pandemic period. In comparing groups for anxiety disorders, statistical significance was found only for GAD ($x^2$= 4.187, p= 0.041). Accordingly, getting a GAD diagnosis increased significantly during the pandemic period.

153 (21.6%) of 707 cases in our study did not get any diagnosis according to DSM-5. These cases form up 19.5% (n= 92) of the cases applied before the pandemic and 26.1% (n=61) of the cases applied during the pandemic period. In the statistical comparison completed, it was specified that the rate of not having any diagnosis according to DSM-5 increased significantly during the pandemic period ($x^2$=4.043, p=0.044).

The analyses of diagnosis distributions were revised by means of including only school-age children in order to understand the reasons for the significant decrease in the application rate of school-age children. Thereafter, ADHD (n = 89, 34.5%), SLD (n = 65, 25.2%), ID (n = 22, 8.5%), Communication Disorders (n = 19, 7.4%) and Anxiety Disorders in cases applyingbefore the pandemic (n = 16, 6.2%) were the most common diagnoses made. Different from this, in the cases applying during the pandemic period, the rate of these diagnoses was 26.2% (n =17) for ADHD, 6.2% for SLD (n=4), 7.7% for ID (n=5), 3.1% for Communication Disorders (n =2), and 18.5% (n=12) for Anxiety Disorders. Significance was found only for SLD ($x^2$=11.204, p =0.001) and Anxiety Disorders ($x^2$=9.857, p= 0.002) in the comparison of diagnosis distributions between groups.

Statistical evaluations were made regarding the presence of psychiatric comorbidities in the cases. At least one psychiatric comorbidity was found in 13.1% (n = 62) of the cases applied before the pandemic and 16.7% (n=39) of the cases that applied during the pandemic. No significance was found in the statistical comparison made about this context ($x^2$=1.619, p = 0.203).The most common comorbidities were SLD with a rate of 3.0% (n=14) in cases applying before the pandemic and Sleep-Wake Disorders with a rate of 6.0% (n=14) in cases applying during the pandemic period.

It was also evaluated whether there is a difference in psychotropic usage preferences between the groups in this study. The most preferred medicine before the pandemic was psychostimulants (15.9%) and atomoxetine (6.3%), considering the distribution of psychotropic usage by application periods. It was determined that Selective Serotonin Reuptake Inhibitors (SSRIs) with a rate of 21.4% and atypical antipsychotics with a rate of 8.1% were preferred more during the pandemic period. It was found in the statistical comparison that the usage of psychostimulants ($x^2$=9.134, p=0.003) and ato-

**Table 2:Diagnostic distribution of cases applying before and during the pandemic period**

| Diagnosis | Before the pandemic N (%) | During the pandemic N (%) | Statistics ($x^2$) | $p^a$ |
|---|---|---|---|---|
| AttentionDeficitHyperactivityDisorder | 123(26.0) | 30(12.8) | 16.046 | **<0.001** |
| Specific Learning Disorder | 65(13.7) | 4(1.7) | 25.737 | **<0.001** |
| IntellectualDisabilities | 49 (10.4) | 16 (6.8) | 2.326 | 0.127 |
| CommunicationDisorders | 47(9.9) | 24(10.3) | 0.018 | 0.894 |
| AnxietyDisorders | 40 (8.5) | 31 (13.2) | 3.978 | **0.046** |
| DepressiveDisorders | 19 (4.0) | 13 (5.6) | 0.858 | 0.354 |
| AutismSpectrumDisorder | 14(3.0) | 12(5.1) | 2.078 | 0.149 |
| TicDisorders | 6(1.3) | 6(2.6) | 1.575 | 0.209 |
| Obsessive-CompulsiveandRelatedDisorder | 5 (1.1) | 16 (6.8) | 18.150 | **<0.001** |
| Disruptive, Impulse-Control, andConductDisorder | 2 (0.4) | 9 (3.8) | 11.978 | **0.001** |
| TraumaandStressorRelatedDisorders | 2 (0.4) | 2 (0.9) | 0.519 | 0.471 |
| EliminationDisorders | 4 (0.8) | 2 (0.9) | 0.000 | 0.990 |
| SomaticSymptomandRelatedDisorder | 1 (0.2) | 2 (0.9) | 1.533 | 0.216 |
| Sleep-Wake Disorders | 3 (0.6) | 3 (1.3) | 0.781 | 0.377 |
| FeedingandEatingDisorder | 0 (0.0) | 1 (0.4) | 2.024 | 0.155 |
| GenderDysphori | 0 (0.0) | 1 (0.4) | 2.024 | 0.155 |
| BipolarandRelatedDisorders | 0 (0.0) | 1 (0.4) | 2.024 | 0.155 |
| SchizophreniaSpectrumandOtherPsychoticDisorders | 1 (0.2) | 0 (0.0) | 0.495 | 0.482 |

*[a]Pearson ki kare*

moxetine ($x^2$=9.009, p=0.003) decreased significantly while the usage of SSRI ($x^2$=18.083, p <0.001) increased significantly during the pandemic period (Table 3).

**Table 3: Distribution of medicine usage in cases applying before and during the pandemic period**

| Psychotropic | Before the pandemic N (%) | During the pandemic N (%) | Statistics ($x^2$) | $p^a$ |
|---|---|---|---|---|
| **Psychostimulants** | 75 (15.9) | 18 (7.7) | 9.134 | **0.003** |
| **Atomoxetine** | 30 (6.3) | 3 (1.3) | 9.009 | **0.003** |
| **Atypical antipsychotics** | 26 (5.5) | 19 (8.1) | 1.807 | 0.179 |
| **Selective Serotonin Reuptake Inhibitors** | 46 (9.7) | 50 (21.4) | 18.083 | **<0.001** |
| **No psychotropic** | 280 (59.2) | 133 (56.8) | 0.359 | 0.549 |
| **Other (Tricyclicantidepressants, benzodiazepines, etc.)** | 16 (3.4) | 11 (4.7) | | |

[a]*Pearson ki kare*

## Statistical Evaluation Results of Strengths and Difficulties Questionnaire (SDQ) Parent form

Strengths and Difficulties Questionnaire (SDQ) Parent form was filled out by 443 parents having children between the age of 6 and 16. The significant difference was found between the average scores of the questionnaire such as emotional problems (U= 15671.0, p=0.004), peer problems (U= 15396.0, p=0.002),internalizing (U=14568.0, P <0.001) and total difficulty (U=14962.0, p= 0.001) and impact (U=15965.5, p=0.008) scorescompared to application periods (Table 4). When the same comparison was made separately according to genders, emotional problems (U=2517.5, p <0.001), conduct problems (U=2885.0, p= 0.013),externalizing (U=2774.5, p=0.006), internalizing (U=2517.0, p <0.001), total difficulty (U = 2378.0, p<0.001), and impact (U=2860.0, p= 0.011) scores were significantly different in female gender.In the comparison made for male gender on the other side, statistical significance was found only in peer problems (U = 4687.0, p = 0.015) (Table 5).

**Table 4: Comparison of mean SDQscores in cases aged between 6 and 16 years old applying before and during the pandemic period**

| | All Group | | | |
|---|---|---|---|---|
| SDQ | Before the pandemic Avg (SD) | During the pandemic Avg (SD) | Statistics (U) | p[a] |
| **Conductproblemsscore** | 2.36 (–1.82) | 2.64(–1.80) | 17180.0 | 0.105 |
| **Hyperactivityscore** | 5.07(–2.78) | 5.44(–2.68) | 17827.0 | 0.292 |
| **Emotionalproblemsscore** | 3.49(–2.44) | 4.35(–2.70) | 15671.0 | **0.004** |
| **Peer problemsscore** | 2.98(–2.07) | 3.56(–1.76) | 15396.0 | **0.002** |
| **Prosocialscore** | 7.24(–2.35) | 7.05(–2.29) | 17892.5 | 0.316 |
| **Externalisingscore** | 7.43(–4.05) | 8.09(–3.83) | 17187.0 | 0.112 |
| **Internalisingscore** | 6.48(–3.92) | 7.90(–3.61) | 14568.0 | **<0.001** |
| **Total difficultiesscore** | 13.87(–6.64) | 15.98(–5.63) | 14962.0 | **0.001** |
| **Impactscore** | 2.69(–2.73) | 3.38(–2.82) | 15965.5 | **0.008** |

[a]*Mann-Whitney U*

**Table 5: Comparison of the mean SDQ scores of cases aged 6 -16 years, who applied before and during the pandemic, according to gender**

| | Female | | | | Male | | | |
|---|---|---|---|---|---|---|---|---|
| SDQ | Before the pandemic Avg (SD) | During the pandemic Avg (SD) | Statistics (U) | p[a] | Before the pandemic Avg (SD) | During the pandemic Avg (SD) | Statistics (U) | p[a] |
| **Conductproblemsscore** | 2.02 (–1.56) | 2.66(–1.61) | 2885.0 | **0.013** | 2.59 (–1.96) | 2.62(–1.97) | 5828.5 | 0.906 |
| **Hyperactivityscore** | 4.28(–2.77) | 5.07(–2.26) | 3061.5 | 0.052 | 5.62(–2.65) | 5.79(–2.99) | 5747.5 | 0.780 |
| **Emotionalproblemsscore** | 3.65(–2.59) | 5.34(–3.01) | 2517.5 | **<0.001** | 3.38(–2.32) | 3.44(–1.99) | 5657.5 | 0.644 |
| **Peer problemsscore** | 3.03(–2.05) | 3.55(–1.82) | 3060.5 | 0.050 | 2.94(–2.09) | 3.56(–1.72) | 4687.0 | **0.015** |
| **Prosocialscore** | 7.14(–2.37) | 7.20(–2.55) | 3595.5 | 0.705 | 7.31(–2.34) | 6.92(–2.03) | 5006.0 | 0.075 |
| **Externalisingscore** | 6.30(–3.84) | 7.80(–3.12) | 2774.5 | **0.006** | 8.21(–4.03) | 8.36(–4.40) | 5805.5 | 0.870 |
| **Internalisingscore** | 6.68(–4.03) | 8.88(–3.91) | 2517.0 | **<0.001** | 6.34(–3.83) | 7.00(–3.08) | 5031.0 | 0.086 |
| **Total difficultiesscore** | 12.94(–6.21) | 16.66(–5.41) | 2378.0 | **<0.001** | 14.50(–6.86) | 15.36(–5.80) | 5282.0 | 0.226 |
| **Impactscore** | 2.58(–2.72) | 3.57(–2.78) | 2860.0 | **0.011** | 2.76(–2.75) | 3.21(–2.86) | 5296.0 | 0.236 |

[a]*Mann-Whitney U*

Again, statistical significance was found for emotional problems (U=1059.0, p<0.001) and internalizing scores (U=1230.0, p=0.009) in comparison of the SDQ scores of the patients applying during the pandemic period. On this basis, girls' emotional problems and internalization scores were significantly higher than boys.

The relationship between the parents' education levels completing the SDQ and the total difficulty score was evaluated using Spearman rank-order correlation analysis. According to the results of this evaluation, it has been determined that there was a negative correlation between education level and SDQ total difficulty score in both the patients applying before the pandemic (Spearman'srho = -0.132, p=0.017) and during the pandemic period (Spearman'srho =-0.284, p=0.002).

## DISCUSSION

The pandemic process is a social crisis process. A child's reaction to the crisis is closely related to the child's developmental stage and the socioeconomic and cultural characteristics of the family. It has been reported in various publications that crises negatively affect children's mental well-being (5,10,11). Although children are not fully aware of the effects of the COVID 19 pandemic, they experience more fear, uncertainty, social and physical isolation, and interruption of school life.

Therefore, it is extremely important to understand their reactions to identify and fulfill their needs (12). Even though studies researching the effects of the pandemic on children and adolescents have increased in the literature, limited studies are reporting how this is reflected in clinical practice. In this context, the effects of the COVID-19 pandemic and the measures taken in our country on the clinical practice of child psychiatry were evaluated in our study.

The dates between 1st of April and 1st of August 2020 forming the data of our study is when COVID-19 infection level began to increase dramatically in Turkey. Face-to-face education was suspended on the 16th of March, 2020, and lockdown to under the age of 20 was announced on the 4th of April, 2020, within the scope of restrictive measures taken by the Government of Turkey (4). These decisions also mean that children are forced to stay at home, and as a result of this, their physical activity and social communication are restricted. The first findings of this study indicate that the pandemic and the measures taken have an effect on the education level of the parents and the application profile of the childhood period. According to these results, it was seen that parents with low education levels who applied significantly more during the pandemic period. As the education level increases, the knowledge and skill levels of the parents about the protection measures for themselves and their children from COVID-19 may increase. In a review working on COVID-19 and its effects on mental health, low education level was mentioned as a risk(13). A negative correlation was also found between the education level of parents and SDQ total difficulty scores in our study. This finding makes think about the lower the parents' education level, the higher the risk of mental health problems in children.

When we consider the application profile in the childhood period, the rates of children in the preschool and adolescent period who applied during the pandemic period increased significantly compared to the same dates of the previous year. It was observed that there was a significant decrease in school-age children in this respect. The negative effects of the COVID-19 pandemic on the mental health of children and teenagers have been shown (5). For this reason, it is difficult to interpret the findings about the significant decrease in the application rate of school-aged children as they are not affected by the pandemic. The decrease was detected in cases affecting academic skills, especially ADHD, SLD, and ID negatively, noticed and guided by school counselors and/or classroom teachers in the analyses including only school-aged children and made to understand the reasons for the decrease in the application rate of school-aged children. Although this decrease does not reach the significance level for ADHD and ID, it is significant for SLD.

Our study examined the effect of the pandemic and the measures taken on the distribution of diagnosis. In this case, the three most common diagnoses made in cases applying before the pandemic were respectively ADHD, SLD, and ID. A significant decrease was found in the rate of ADHD and SLD diagnosis during the pandemic period. This finding may be related to the suspension of face-to-face education in schools since teachers play an important role in noticing and guiding these children. In this respect, the suspension of face-to-face education may have made the diagnosis of ADHD and SLD difficult.

Additionally, these two diseases are also known to impair school functionality substantially and bring additional stress load to children with these diagnoses. Several studies have reported well-being for ADHD patients during the pandemic process (14,15).In one of these studies, parents have stated that their children with ADHD were better or the disease was progressing stably. It was stated in the same study that parents were better aware of the inattention and other problems of a child due to ADHD. Besides, the reduction of school-related anxiety and the ability to stretch according to the rhythm of a child were emphasized as other positive reflections of the process (14). According to parent reports, it was found in another study that children with ADHD improve their mood and behaviour after schools were closed (15).

Anxiety disorders' diagnosis was significantly higher than the same dates of the previous year during the pandemic period. The significant increase was

found only in the diagnosis of GAD among anxiety disorders during the pandemic period. Though there is an increasing tendency in diagnosing Depressive Disorders during the pandemic, it has not reached this level of significance. It was found that children showed high rates of anxiety, depression, and post-traumatic stress disorder symptoms in a review working towards COVID-19 (5). In a study in which the anxiety levels of 289 Brazilian children aged 6 and 12 years were measured during the pandemic, their anxiety prevalence was found as 21.8% (16). Eight thousand seventy-nine participants aged 12 and 18 years were recruited in a study investigating the prevalence of depression and anxiety among Chinese teenagers during the COVID-19 pandemic; moreover, the frequency of anxiety was reported as 37.4%, and the frequency of depression and comorbid anxiety as 31.3% (7). It was also stated that the risk for GAD was higher in this period (17).

Another diagnosis in which a significant increase was observed during the pandemic period in our study was Obsessive-Compulsive Disorder and Related Disorders. It is important to pay proper attention to certain psychiatric situations that may begin or become intensified by a disaster. Obsessive-Compulsive and Related Disorders may be one of these psychiatric circumstances because the derogation of the COVID-19 outbreak can affect individuals living with Obsessive-Compulsive Disorder (OCD). Anxiety about the virus may be the cause to increase of their transmission fear and further trigger compulsive behavior in some individuals having OCD. Studies have reported that the mood of children and teenagers due to fear during the COVID-19 pandemic is largely tended to disorders related to anxiety and stress, including OCD (18).

Our study shows that the differentiation in the diagnosis profile also affects the medicine usage preferences. Accordingly, the use of SSRIs increased significantly during the pandemic period. A significant increase in the diagnose of Anxiety Disorders and Obsessive-Compulsive and Related Disorders during the pandemic period, again an increase in the diagnosis of depressive disorders may explain the increase in SSRI usage, although it did not reach the level of significance in this diagnosis.

One of the exciting findings of this study is an increase in the rate of cases not diagnosed due to DSM-5 during the pandemic period. This finding may be related to reports of children and teenagers, such as less well-being due to the pandemic even though they did not receive any psychiatric diagnosis. Studies show that children at all developmental stages are at high risk during this process (7,19-27). In addition to this, causes such as job loss of parents, loss of income, increased caregiving burden, or their infection can adversely affect both parents and children's mental health (28). This may make it difficult for parents to manage mental problems appearing in children and teenagers.

The SDQ Parent form was routinely used as a part of the evaluation in cases aged 6 and 16 years applying to our clinic for the first time. Significant results were found in comparing the questionnaire scores in cases between the ages of 6 and 16 as to the application period. A significant increase was found in the emotional problems, peer problems, internalizing, and total difficulty and impact scores of the questionnaire in cases that applied during the pandemic. These findings regarding the SDQ data can be explained by the effect of the pandemic on children. Furthermore, the significant increase in SDQ impact score makes us think that mental difficulties occurring during the pandemic affect children more. This finding supports the literature reporting the negative effects of the pandemic in the pediatric population (5,6).

SDQ scores were also evaluated in terms of gender. Therefore, there were significant increases in emotional problems, conduct problems, externalizing, internalizing, total difficulty, and impact scores in female cases that applied during the pandemic compared to those applying before the pandemic. On the other hand, for the male gender, a statistically significant increase was found only in peer problems. Moreover, it was observed that the emotional problems and internalizing scores of the female gender were significantly higher than the male gender compared to the mean SDQ scores of the cases applied during the pandemic period.

These findings suggest that the COVID-19 pandemic may have different effects on the genders. Studies show that girls are more likely to exhibit anxiety and depressive symptoms during the pandemic (7,21).

### Limitations

Our study has a retrospective design is a substantial limitation. In addition to this, it is a single-center study, and data collection within a relatively narrow time frame that does not only cover the early period of the pandemic is among the other limitations. In spite of these limitations in our study, the strengths of our study are that it compares with the characteristics of patients who applied in the pre-pandemic period and presents data on a commonly used measurement tool in the evaluation of emotional-behavioral problems in children.

## CONCLUSION

The findings of the present study indicate that important findings like age, gender, diagnosis distributions, emotional and behavioral problems could be a guide about what waits for specialists working in the field of child and adolescent psychiatry clinics in as much as managing the applications of mental health is a critical problem in a pandemic scenario. Especially, it was determined that there was a significant decrease in the diagnosis rates of ADHD and SLD. Considering the role of teachers in recognizing and guiding these children, this situation may be related to the closure of schools, which was one of the measures taken during the pandemic period. Determination of a significant increase in the diagnosis of Anxiety Disorders is among our other note-worthy findings. In addition, SDQ data show that the female gender is more affected.

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### Availability of Data andMaterial

Thedata sets used and/or analysed during the current study are available from the corresponding author on reasonable request.

### Authors' Contribution

Ferhat Yaylaci designed the study, wrote the protocol, and conducted the survey. Baris Guller performed statistical analysis, and wrote the first draft of the manuscript. All the authors read and approved the submitted version of the manuscript.

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