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COVID-19 impact on children anxiety and mental health problems during the early phase of pandemic

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Abstract

This study aims to evaluate the general psychiatric disorders and state anxiety levels of children and adolescents who visited the child psychiatry outpatient clinic during the first three months of the pandemic. Sociodemographic Data Form, collected the basic sociodemographic information (age, gender, parental education, etc.) and children's awareness and knowledge level of Coronavirus disease 2019 (COVID-19). Child Behavior Checklist-Parent Form (CBCL), State-Trait Anxiety Inventory for Children (STAIC), and Children Global Assessment Scale (CGAS) were used to evaluate behavioural and emotional problems, anxiety and global functioning. The study included a total of 62 female (mean age 13.72±2.44) and 38 male (mean age 12.98±2.95) children and adolescents aged 6-18 who visited the Child Psychiatry outpatient clinic of Tekirdağ State Hospital between 1 April 2020 and 30 June 2020 during the COVID-19 pandemic (n=100). The level of knowledge about the pandemic and prevention from COVID-19 viruses was at a moderate level. STAIC scores were significantly higher in girls (p=0.016). To assess variables that could predict Children Global Assesment Scale (CGAS) scores, the best predictors of the CGAS scores were anxiety score. In conclusion, it is suggested that the mental health of children and adolescents should be monitored carefully during pandemics.

Keywords: COVID-19 pandemic, anxiety, depression, child psychiatry

Introduction

Coronavirus disease 2019 (COVID-19), was first detected in Wuhan, China, in November 2019, and due to the rapid spread of the virus, it was declared a pandemic by the World Health Organization [1]. In addition to the physical effects and health issues seen in individuals who contracted COVID-19, societal panic and stress experienced during the pandemic led to significant mental health problems, especially among healthcare workers and other individuals in society [2]. The increasing number of cases daily heightened individuals' perception of future threats toward themselves and their family members [3].

In Türkiye, face-to-face education in schools was suspended during the early phase of the pandemic, and after necessary adjustments, an online-based education system was implemented [4]. A curfew was imposed for children and young people under the age of 20 for a certain period [5]. Fears of the disease spreading to themselves and family members, school closures, curfews, changes in parents\' work routines, and disruptions in daily family schedules contributed to a significant increase in stress and anxiety among children and adolescents, as well as limiting their ability to engage in regular social activities [6].

Many studies conducted during the pandemic have found that children's emotional and behavioral well-being was negatively affected. Stressful life events can worsen symptoms in children with pre-existing psychiatric conditions and may even trigger new disorders in those without prior symptoms [7]. A study in China showed that the pandemic led to moderate-to-severe levels of anxiety and depressive symptoms in approximately one-third of the population. Lack of daily routines, internet use, media exposure connected to COVID-19, and having a relative in a high-risk profession were all identified as risk factors for anxiety and depression symptoms in children and adolescents. [8-10]. In countries with curfews, children struggled with utilizing

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their free time indoors, screen time increased, and daily routines were disrupted [10]. This was also associated with disruptions in children's sleep-wake cycles. All age groups reported notable changes in their bedtimes and wake-up hours. [11]. Delays in sleep times were most pronounced in school-aged children and adolescents, with a large number reporting going to bed after 11:00 PM [11].

Numerous studies have been conducted on the overall effects of the pandemic on society; however, the majority of these studies were conducted online. There are few studies in Türkiye that assess the mental health status of children and adolescents during hospital visits during the pandemic. This study aims to evaluate the general psychiatric disorders and anxiety levels of children and adolescents who visited the child psychiatry outpatient clinic during the early phase of the pandemic, when measures were most strictly applied.

Material and Methods

This study is cross-sectional in nature. The study included voluntary children and adolescents aged 6-18 who visited the Child Psychiatry outpatient clinic of Tekirdağ State Hospital between 1 April 2020 and 30 June 2020 during the COVID-19 pandemic (n=100). The study was conducted face to face by the child and adolescent psychiatrist. Early phase were determined as first three months after the Minister of Health of Türkiye announced on April 1, 2020 that coronavirus cases had spread throughout Türkiye [4,5]. Children diagnosed with intellectual disability, autism spectrum disorder, or chronic unstable medical conditions, as well as those under the care of social services were excluded from the study. Interviews were conducted in accordance with social distancing rules. Psychiatric diagnoses were evaluated based on Diagnostic and Statistical Manual of Mental Disorders- Fifth Edition (DSM-5) criteria [12]. Of the 138 children and adolescents who visited the clinic within three months, 30 refused to participate in the study, and 8 were excluded due to incomplete forms.

This research was approved by the Non-Interventional Clinical Research Ethics Committee of Tekirdağ Namık Kemal University with protocol number 2020.110.05.11.

Assessment Tools

Sociodemographic Data Form, developed by the researchers to collect basic sociodemographic information (age, gender, parental education, etc.) and children's awareness of COVID-19. The questions were asked regarding COVID-19, such as whether a first-degree relative had the disease, the number of days spent indoors, daily screen time, and if a new hobby was adopted during the pandemic. Participants were also asked to rate how knowledgeable they felt about the pandemic, the level of prevention, and their level of engagement in school programmes, using a scale from 1 to 10 (1 being the lowest/very inconsistent and 10 the highest/very consistent). Basic questions regarding sleep patterns were included in the form (What is your bedtime?, What is your wake up time?, What is your total sleep duration?, Is there a change in your sleep patterns?.). Due to pandemic conditions, the sociodemographic form focused on gathering essential information, avoiding detailed questions.

Child Behavior Checklist-Parent Form (CBCL), developed by Achenbach (1991) to determine social competencies and behavioral problems in children and youth aged 4-18, based on information provided by parents regarding the last six months [13]. The Turkish adaptation was done by Erol et al. (1995) [14]. The scale consists of two sections: "Social Competence" and "Problem Behaviors". The Problem Behaviors section includes 118 items, each with three options. Subscale scores for Withdrawal, Somatic Complaints, Anxiety-Depression, Social Problems, Thought Disorders, Attention, Delinquent Behavior, and Aggression are obtained. For problem behaviors, a T-score ≥67 is considered clinically significant.

State-Trait Anxiety Inventory for Children (STAIC), developed by Spielberger (1970), the STAIC measures state and trait anxiety using two 20-item subscales [15]. The Turkish validity and reliability study was conducted by Özusta (1993) [16]. This study used the state anxiety subscale.

Children's Global Assessment Scale (CGAS) was used to assess the participants' general functioning level [17]. This scale provides a single score between 1 and 100 based on a clinician's assessment of various aspects of a child's psychological functioning. Children with a score of 80 or below are recommended for psychiatric follow-up, and those with a score of 60 or below are recommended for both psychiatric follow-up and treatment.

Statistical Analysis

Descriptive statistics, including frequency, percentage, mean, and standard deviation values, were used to summarize the data. The Kolmogorov-Smirnov test assessed data distribution. Chi-squared tests were used to analyze categorical variables. For the analysis of parametric cross-sectional data, the T-test was used. Analyses were conducted using SPSS version 20.0, with a significance level of 0.05. p-values greater than this were considered statistically insignificant, while values less than or equal to 0.05 were considered significant.

Results

A total of 62 female (mean age 13.72±2.44) and 38 male (mean age 12.98±2.95) adolescents participated in our study, all of whom had previously been under psychiatric follow-up. The demographic and familial characteristics of the participants are summarized in Table 1. During the pandemic, the mean score for participants' perceived knowledge about COVID-19 was 6.12±1.88 for girls and 6.34±2.78 for boys. The mean prevention score against COVID-19 was 7.75±2.07 for girls and 7.92±2.60 for boys. Their participation in school programmes during the COVID-19 pandemic scored 6.43±3.10 for girls and 6.05±3.45 for boys (p=0.649, 0.731, and 0.568, respectively). Table 2 provides further summary of participant behaviours, attitudes, and changes related to sleep patterns during the COVID-19 pandemic.

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Based on psychiatric interviews using DSM-5 criteria, 28% (n=28) of participants were diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), 15% (n=15) with Oppositional Defiant Disorder (ODD), 4% (n=4) with Conduct Disorder (CD), 41% (n=41) with Anxiety Disorders, 19% (n=19) with Major Depression, 2% (n=2) with Bipolar Disorder, 2% (n=2) with Psychotic Disorders, %16 (n=16) with Obsessive-Compulsive Disorder (OCD), 5% (n=5) with Tic Disorders, and 3% (n=3) with Sleep Disorders. The psychiatric diagnoses, medication usage, and types of psychotropic medications are summarized in Table 3.

The participants scored as follows on the CBCL subscales: Withdrawn 50.29±11.46, Somatic Complaints - 53.72±13.26, Anxiety/Depression - 48.96±11.09, Social Problems - 42.66±10.31, Thought Problems - 50.0±9.61, Attention Problems - 43.82±9.98, Delinquent Behavior - 43.02±9.16, and Aggressive Behaviour - 37.70±8.60. The CBCL, STAIC and CGAS scores of boys and girls are presented in Table 4.

To assess variables that could predict CGAS scores, factors such as age, gender, state anxiety scale score, total CBCL score, and screen time were examined using multiple linear regression analysis. The best predictors of the CGAS scores were STAIC score. It was found that the STAIC score (p=0.004) was a significant factor influencing CGAS scores (Table 5).

Table 1. Sociodemographic characteristics of participants

	Study group (n=100)
	N (%)
Mother's educational level	
No literacy	5 (5)
Primary school graduate	28 (28)
Elemantary school graduate	16 (16)
High school graduate	36 (34.6)
University graduate	15 (11.5)
Father's educational level	
No literacy	2 (2)
Primary school graduate	34 (34)
Elemantary school graduate	10 (10)
High school graduate	35 (35)
University graduate	19 (19)
Family	
Nuclear family	83 (83)
Divorced	17(17)
Family history of mental health problems in first-degree relatives	44 (44)
	Mean±SD
Mothers' age	41.33±5.83
Fathers' age	45.10±5.86

Table 2. Participants' characteristics regarding the COVID-19 pandemic

	Female N=62 (%)	Male N=38 (%)	p
History of COVID-19 in first degree relatives	16 (25.8)	9 (23.7)	0.812*
Knowledge level of COVID-19			
0-5	20 (32.3)	16 (42.1)	0.319*
6-10	42 (67.7)	22 (57.9)	
The level of prevention			
0-5	6 (9.7)	5 (13.2)	0.598*
6-10	56 (90.3)	33 (86.8)	
Level of attendance to school programmes			
0-5	24 (38.7)	14 (36.8)	0.852*
6-10	38 (61.3)	24 (63.2)	
Engaging in hobby activities	21 (33.9)	15 (39.5)	0.571*
Change in sleep patterns (yes)	39 (62.9)	19 (50)	0.204*
Bedtime hours			
20:00-23:59	30 (48.4)	18 (47.4)	
00:00-05:59	28 (45.2)	15 (39.5)	
06:00-11:59	4 (6.4)	5 (13.2)	
12:00-19:59	0 (0)	0 (0)	
	Mean±SD	**Mean±SD**	
Longest number of days stayed at home	38.19±23.20	33.34±24.25	0.321**
Screen time (hours/day)	6.08±3.27	6.07±3.06	0.098**
Total sleep duration	8.87±2.04	8.57±1.76	0.468**

*p<.05, Chi Square Test; ** p<.05, Student T test

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Table 3. Psychiatric diagnosis and medication types

	Female N (%)	Male N (%)	p
ADHD	11 (17.7)	17 (44.7)	**0.004**
Anxiety disorders	26 (41.9)	8 (21.1)	**0.032**
ODD	4 (6.5)	11 (28.9)	**0.002**
Depressive disorder	15 (24.2)	4 (10.5)	0.091
OCD	10 (16.1)	6 (15.8)	0.964
Medication use	47 (75.8)	28 (73.7)	0.812
Methylphenidate	11 (17.7)	11 (28.9)	0.189
Atomoxetine	1 (1.6)	3 (7.9)	0.120
SSRI	34 (54.8)	15 (39.5)	0.136
Antipsychotics	10 (16.1)	14 (36.8)	**0.019**
Mood stabilizors	2 (3.2)	1 (2.6)	0.866
Other drugs	7 (11.3)	3 (7.9)	0.583

*p<0.05 Chi Square test; ADHD: attention deficit hyperactivity disorder, ODD: oppositional defiant disorder, OCD: obsessive compulsive disorder, SSRI: selective serotonine reuptake inhibitor

Table 4. CBCL, state trait anxiety and CGAS scores

	Mean±SD		p
	Female N=62	**Male N=38**	
CBCL total score	61.96±11.60	57.6316±12.22	0.083
CBCL internalizan problems	66.88±11.53	62.36±11.52	0.061
CBCL externalizing problems	53.00±11.92	49.55±11.36	0.152
Withdrawn subscale	52.24±12.38	47.10±9.06	**0.019**
Somatic complaints subscale	54.14±11.26	53.02±16.15	0.709
Anxiety/depression subscale	50.83±11.88	45.89±9.00	**0.021**
Social problems subscale	43.25±10.68	41.68±9.75	0.452
Thought problems subscale	51.25±9.08	49.73±10.46	0.461
Attention problems subscale	44.75±9.27	42.28±11.00	0.252
Delinquent behaviour subscale	43.70±10.15	41.89±7.25	0.301
Aggressive behaviour subscale	39.58±8.49	34.63±7.97	**0.004**
State trait anxiety score	38.11±9.44	33.52±8.73	**0.016**
CGAS	69.77± 11.07	70.92±13.24	0.659

p<0.05, student t test; CBCL: child behavior checklist, CGAS: Children's Global Assessment Scale

Table 5. Regression model showing variables predicting participants' CGAS scores

Independent variables	Unstandardized coefficients		Standardized coefficients	p	Confidence interval 95%	t
	Beta	**Standart error**	**Beta**			
(Constant)	90.952	9.961		0.000	(71.770)-(110.134)	9.414
Age	.183	.471	0.040	0.698	(-.751)-(1.117)	.389
Gender	-1.028	2.490	-0.042	0.681	(-5.972)-(3.916)	-.413
CBCL total score	-0.111	0.106	-0.110	0.297	(-.321)-(.099)	-1.048
STAIC score	-.399	.135	-.311	**0.004**	(-.666)-(-.131)	-2.959
Screen time	-.099	.388	-.026	.297	(-.870)-(.671)	-1.048
	R=0.347 R^2=0.121 F=2.580 P=0.031 Durbin-Watson=2.006					

Regression Analysis, p<0.05; CBCL: child behavior checklist, STAIC: state-trait anxiety inventory for children

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Discussion

As a result of our study, in the early phase of the pandemic, psychiatric outpatient visits for children and adolescents decreased significantly due to curfews, all participants in our study were patients who had previously been followed up in a psychiatric outpatient clinic. Notably, girls were more likely to attend outpatient clinic than boys. Many hospitals in Türkiye and worldwide suspended elective outpatient visits and prioritized emergency visits during the pandemic [18-20]. Other centers that continued to receive patients also reported a predominance of female attendees, citing increased anxiety and depression in women as contributing factors to higher rates of visits in the early stages of the pandemic [21].

Both girls and boys reported moderate knowledge levels about COVID-19, with an average score of around 6, feeling moderately informed. Although their self-rated knowledge was moderate, both genders reported higher adherence to preventive measures. A study that conducted with online assesment with young people, also reported similar knowledge and self-protection levels, noting that psychological well-being increased with higher knowledge and adherence to preventive measures [22]. Participation of school programmes scores were around 6, indicating that online education was not highly effective. Research on Türkiye's distance education system highlighted the importance of the model in keeping students connected with teachers and peers, which helped alleviate anxiety However, when compared to traditional in-person learning, online education was less effective due to technical problems and the absence of an organized setting [23].

In terms of hobbies and activities, both genders engaged in such activities at a relatively low rate of about one-third. Screen time was approximately 6 hours on average, with some youth spending up to 10 hours in front of screens. Those who fully adhered to restrictions stayed indoors for an average of 30 days, while those who went outdoors earlier were primarily individuals with health appointments or those living in rural areas. Sleep pattern analysis indicated that about half of the children went to bed between 8:00 PM and midnight, but about 40% reported going to bed between midnight and 6:00 AM, showing a disruption in sleep schedules. Despite going to bed late hours, children maintained an average of 8 hours of sleep. No significant gender differences were found in bedtime or sleep duration. Various studies have reported that pandemic conditions negatively affected children's quality of life, disrupted sleep patterns, increased internet use, decreased school attendance, and led to aggressive behaviors [24-26] To mitigate the emergence of these adverse effects, intervention programs should be pre-determined and swiftly implemented when necessary [27].

In terms of psyhiatric diagnosis, anxiety and depressive disorders were significantly higher among girls, while ADHD and ODD were significantly higher among boys. CBCL scores showed that girls had higher total scores, particularly in Withdrawal, Anxiety, and Aggression subscales. STAIC scores were also significantly higher among girls, while functioning scores were similar across genders. Studies investigating the impact of the COVID-19 pandemic on the mental health of children and adolescents have frequently reported that youth experienced increased anxiety and depressive symptoms compared to pre-pandemic levels. The pandemic has disrupted daily activities and routines, leading to feelings of anxiety and stress and triggering frequent fears that adversely affect lives. It has been reported that internalizing problems like anxiety and depression are more prevalent in females, and that females are more sensitive to stressors, making them a risk factor for psychiatric admissions [19,22]. CBCL subscale scores and state anxiety scores were reported in parallel with these disorders. The high CBCL Aggression scores were thought to be associated with irritability frequently observed in anxiety and depressive disorders. ADHD and ODD are known to be more common in boys epidemiologically. The online-based education system and curfews presented challenges for children with focus and hyperactivity issues, which led families to continue their children's treatments without interruption.

Medication use rates were similar across genders, with Selective serotonine reuptake inhibitors (SSRIs), stimulants, and antipsychotics being the most commonly used drug groups. Previous studies in Türkiye reported medication use rates around 60% among child psychiatry visits; however, this rate was found to be higher in our study [28]. It is thought that the need for time for therapy sessions led to a preference for medical treatments during the pandemic period [29]. Antipsychotic use was significantly higher among boys. Increased aggression observed in boys, especially those with ADHD, CD, and ODD was likely due to factors such as confinement to the home, increased internet use, and lack of outdoor activities, which led to a higher rate of antipsychotic use in treatment.

The average CGAS scores of participants were around 70. When analyzing factors predicting functioning, it was found that higher anxiety scores predicted lower functioning. The fact that all patients who visited the outpatient clinic during the pandemic were already under psychiatric follow-up contributed to lower functionality scores. Furthermore, increased anxiety due to pandemic-related stress, sudden changes in daily routines home and school life, and fear of possible COVID-19 infection were the most significant factors affecting functionality. A study examining anxiety levels in children during the pandemic also found that anxiety rates were highest during the strict pandemic restrictions, when schools were closed [30].

Our study was conducted in a hospital that continued outpatient clinic services during the pandemic. Data were collected face-to-face with patients and their families, adhering to social distancing measures, which strengthens the reliability of our study. However, a limitation is the small number of participants due to pandemic restrictions and fear of disease transmission in hospitals.

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Conclusion

Our study examined child psychiatry visits during the first three months of the pandemic, a period with strict curfews. We found that outpatient visits significantly decreased, with more visits from female patients. Anxiety and depressive symptoms were more frequent in girls, while ADHD and ODD were more common in boys. The primary factor affecting functioning was the anxiety symptoms observed in children.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical Approval
This research was approved by the Non-Interventional Clinical Research Ethics Committee of Tekirdağ Namık Kemal University with protocol number 2020.110.05.11.

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