

The Effects of Lockdown on the Severity of Symptoms of Attention Deficit Hyperactivity Disorder and Disruptive Behavior Disorders and on Children/Adolescents' Ability to Cope with Stress

Karantina Döneminin Çocuk ve Ergenlerin Dikkat Eksikliği Hiperaktivite Bozukluğu ve Yıkıcı Davranış Bozukluklarının Belirti Şiddeti ve Stresle Baş Etme Becerileri Üzerindeki Etkisi

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Abstract

Introduction and Objective: The aim is to examine changes in the severity of symptoms during the lockdown period in patients diagnosed with attention deficit hyperactivity disorder (ADHD) and Disruptive Behavior Disorders (DBD), and to determine the relationship between the methods of coping with the stress experienced by the children and the severity of ADHD and DBD.

Method: 92 patients, between the ages of 6-18, who were diagnosed with ADHD included in the study. Sociodemographic data form and the Turgay DSM-IV-Based Child and Adolescent Behavioral Disorders Screening and Rating Scale were given to parents, the Coping Styles of Stress Scale was given to children.

Results: It was found that ADHD, Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD) scores decreased significantly, compared to before the pandemic. There wasn't a significant difference between pandemic-related features and ADHD, ODD, and CD scores. A significant relationship was not observed between stress-coping methods and ADHD and CD scores and as ODD scores increased, the rate of using the submissive approach increased.

Conclusion: Adaptation to acute changes such as a pandemic can be challenging for children and adolescents. During these processes, especially children and adolescents diagnosed with ADHD are at risk for developing additional mental problems. Evaluating the stress coping methods of patients diagnosed with ADHD and DBD and their parents who apply to outpatient clinics in interviews and supporting them to develop healthy coping methods are important issues both during the stressful situation and in terms of providing psychological resilience against subsequent stresses.

Keywords: Attention Deficit Hyperactivity Disorder, Disruptive Behavior Disorder, Coping Strategies, COVID-19 Pandemic, Lockdown.

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Özet

Giriş ve Amaç: Dikkat Eksikliği Hiperaktivite Bozukluğu (DEHB) ve Yıkıcı Davranış Bozuklukları (YDB) tanısı konmuş hastaların karantina dönemindeki semptom şiddetindeki değişikliğin incelenmesi ve DEHB ve YDB'nin şiddeti ile çocuklar tarafından yaşanan stresle baş etme yöntemleri arasındaki ilişkinin belirlenmesi amaçlanmaktadır.

Yöntem: Çalışmaya DEHB tanısı almış 6-18 yaş arası 92 hasta dahil edilmiştir. Ebeveynlere sosyodemografik veri formu ve Turgay Çocuk ve Ergenlerde Davranım Bozuklukları için DSM-IV'e Dayalı Tarama ve Derecelendirme Ölçeği, çocuklara ise Stresle Başa Çıkma Tarzları Ölçeği verilmiştir.

Bulgular: Pandemi öncesine göre DEHB, Karşıt Olma Karşı Gelme (KOKGB) ve Davranım Bozukluğu (DB) puanlarının anlamlı olarak düştüğü saptanmıştır. Pandemi ile ilişkili özellikler ile DEHB, KOKGB ve DB puanları arasında anlamlı bir fark bulunmamıştır. Stresle başa çıkma yöntemleri ile DEHB ve DB puanları arasında anlamlı bir ilişki gözlenmemiş ve KOKGB puanları arttıkça boyun eğici yaklaşımı kullanma oranının arttığı saptanmıştır.

Sonuç: Pandemi gibi akut değişikliklere uyum çocuk ve ergenler için zorlayıcı olabilmektedir. Bu süreçlerde özellikle DEHB tanılı çocuk ve ergenler ek ruhsal sorunlar geliştirmek açısından risk altındadır. Polikliniklere başvuran DEHB ve YDB tanılı hastaların ve ebeveynlerinin stresle başa çıkma yöntemlerinin görüşmelerde değerlendirilmesi ve sağlıklı baş etme yöntemleri geliştirmeleri açısından desteklenmesi hem stres yaratan durumun yaşandığı süreçte hem de sonraki streslere karşı psikolojik dayanıklılık sağlanabilmesi açısından önemli konulardır.

Anahtar Kelimeler: Dikkat Eksikliği Hiperaktivite Bozukluğu, Yıkıcı Davranış Bozukluğu, Baş Etme Yöntemleri, COVID-19 Pandemisi, Kısıtlama.

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a common neurodevelopmental disorder in children. Attention problems, hyperactivity, and impulsivity is observed in clinical evaluation (1). ADHD has a negative impact on many aspects of children's lives, particularly their self-esteem, academic performance, relationships and emotions (2,3). In addition to genetic factors, environmental factors also influence the severity of ADHD symptoms. While symptoms are less likely to be observed in unfamiliar or quiet environments, factors that increase arousal, such as high visual stimulation, noisy environments and crowded classrooms, can increase impulsivity and inattention (4).

The COVID-19 pandemic is a worldwide health issue, and measures such as the suspension of face-to-face education, restrictions on social life and lockdowns have been implemented in our country since March 2020 to prevent the spread of infection. The long-term isolation experienced as a result of this situation and the uncertainty caused by the pandemic have had a negative impact on people's mental health. Increases in depression, post-traumatic stress disorder, sleep disorders and domestic violence have been observed (5,6). Studies have shown that the pandemic has led to a deterioration in the mental health of the pediatric population due to the suspension of face-to-face education, the implementation of social distancing policies, the reduction of outdoor activities and social interaction, and the increase in time spent online (7,8). In addition to academic learning, continued face-to-face education allows children and adolescents to develop the social skills necessary for their mental health, to maintain contact with their teachers and classmates, and to receive emotional support from their environment (9,10). However, switching to distance learning as a result of the pandemic has isolated children, increased feelings of loneliness and negatively affected their mental health (11,12).

The aim of this study is to investigate whether there is a change in the symptom severity in children and adolescents diagnosed with ADHD and disruptive behavior disorders (DBD) in our department before the pandemic, during the implementation of the COVID-19 pandemic

precautions, and to determine whether there is an association between the children's coping mechanisms with stress and the ADHD and DBD symptom severity.

METHOD

Study approval was obtained from Kocaeli University Clinical Research Ethics Committee under the reference number GOKAEK-2021/4.08 on 18 February 2021. Patients and their families were asked to complete informed consent forms, which were prepared separately for parents and children.

Design and Sample

This was a cross-sectional survey carried out at a university hospital in Kocaeli, Turkey. Patients were taken into the study from the department of child/adolescent psychiatry. All patients who presented to the Child/Adolescent Psychiatry Department of our hospital in the year before the start of the pandemic between the ages of 6-18 years, and diagnosed with ADHD and had the Turgay DSM-IV-based Child and Adolescent Behavioral Disorders Screening and Rating Scale (T-DSM-IV-S), which is routinely administered in our department and completed by parents. Patients with neurological disorders, organic brain damage, major depressive disorder, anxiety disorder, and intellectual disability were not included in the study. Patient files were screened according to the inclusion criteria and these patients were contacted by phone and informed about the study. Forms were given to the patients who agreed to participate in the study and their parents, and they were asked to fill them out online or during outpatient clinic visits. Some of the data obtained in the study were used in a study titled "Being a Child with ADHD, and Parent of them during the Pandemic Period" and the results obtained were sent to another scientific journal for publication.

Data Collection Process

Sociodemographic Data Form

This form, prepared by the researchers, asked about the patient's age, sex, who the patient lived with, what medication the patient was taking, the parents' age, education and health status, and pandemic's effects on the child and the family, was given to parents.

Turgay DSM-IV-Based Child and Adolescent Behavioral Disorders Screening and Rating Scale (T-DSM-IV-S)

The scale was routinely given to parents during our interviews. The scale was developed by Atilla Turgay (13) in 1995. In the scale, 9 questions assess Attention Deficit Disorder (AD), 9 questions assess Hyperactivity-Impulsivity (HI), 8 questions assess Oppositional Defiant Disorder (ODD), and 15 questions assess Conduct Disorder (CD). The validity and reliability of the scale, which consists of 41 questions in Turkish, were ensured by Ercan et al (14). Each item is scored as "0=none, 1=a little, 2=more than a little, 3=a lot". ADHD, ODD and CD were diagnosed using the scale in conjunction with clinical interviews. A minimum of 12 points for ADHD subtypes, 8 points for ODD and 6 points for DD were considered sufficient for diagnosis using the scale. The scale is routinely administered at the first outpatient clinic visit for children suspected of having ADHD. Parents of children and adolescents were completed the scale again during the pandemic.

The Coping Mechanisms for Stress Scale (CSSS)

The scale was administered to children to determine how they were coping with the traumatic pandemic and the process of restriction. The interviewer helped young children who had difficulty reading or understanding the questions to complete the forms. The scale was developed by Şahin and Durak (15) based on the Coping Mechanisms Inventory developed by Folkman and Lazarus (1980) (16) to assess individuals' coping mechanisms with stress. The scale consists of a total of 30 4-point Likert items and a total of five sub-dimensions: Self-Confident Approach (SCA), Optimistic Approach (OA), Helpless Styles Approach (HSA), Submissive Approach (SA) and Social Support Seeking Approach (SSSA).

Statistical Analyses

The data collected were analyzed using the IBM SPSS 20.0 (SPSS Inc., Chicago, IL, USA) package program. The Kolmogorov-Smirnov test was used to evaluate the suitability of the normal distribution. Normally distributed numerical variables are represented by mean +/- standard deviation, non-normally distributed numerical variables are represented by median (25.-75. percentiles), and categorical variables are represented by frequency (percentiles). The Wilcoxon Test was used to compare before and after pandemic T-DSM-IV-S subscale median scores. Spearman Correlation Analysis was used for correlation between coping mechanisms for stress and ADHD subtypes, ODD, and CD. $p < 0.05$ was considered sufficient for statistical significance.

RESULTS

In the study group consisting of 92 patients, 22 were female (23.9%) and 70 were male (76.1%). The mean age of the group is 12.12 ± 2.44 years, and 14.1% of the group attended primary school, 56.5% of the group attended secondary school and 29.4% of the group attended high school.

The mean age of the mothers was 39.98 ± 5.28 years and the majority of them were high school graduates (35.9%) and housewives (76.1%); 92.4% (n:85) had no mental illness and 90.2% (n:83) had no physical illness.

The mean age of the fathers was 42.34 ± 6.40 years and 43.5% of them were high school graduates, 97.8% were employed, 96.7% (n:89) had no mental illness, and 88% (n:81) had no physical illness.

Looking at the impact of the pandemic on the lives of children in the group, 69.9% of the children reported never or rarely meeting their friends over the internet/phone and 78.8% reported not following online lessons. Other effects are shown in Table 1.

When examining how symptoms of ADHD and DBD changed with the pandemic, it was found that ADHD, ODD and CD scores decreased significantly compared to before the pandemic (Table 2).

Table 1. Effects of the Pandemic Process on the Lives of Children with ADHD

Groups	Features	N	Percentage (%)
How children spend time at home during lockdown	Studying	46	50
	Spending time on the internet	40	43.5
	Doing activities with the family	3	3.3
	Talking or doing activities with friends	3	3.3
Frequency of the childrens' communication with friends over the internet/phone	Never – Rare	64	69.6
	Frequent - Very often	28	30.4
Childrens' follow-upstatus of online lessons	No	72	78.3
	Yes	20	21.7
Change in the childrens' sleep pattern	Same	48	52.2
	Hours have changed	30	32.6
	Total sleep time increased	7	7.6
	Total sleep time decreased	7	7.6
How was the change if the sleep time has changed	Late bedtime	24	54.5
	Irregular bedtime	19	43.2
	Early bedtime	1	2.3
Childrens' history of contracting Covid-19	No	79	85.9
	Yes	13	14.1

ADHD: Attention-Deficit Hyperactivity Disorder

Table 2. T-DSM IV-S Median Scores and Percentiles Before and After the Pandemic

T-DSM IV- S Subscale Scores	Before Pandemic	After Pandemic	P
	Median (25. - 75. percentil)	Median (25. - 75. percentil)	
ADHD-AD	13.50 (9.00-17.00)	10.00 (6.00-15.00)	<0.001*
ADHD- HI	11.50 (6.00-18.50)	7.00 (3.00-13.00)	<0.001*
ADHD- total score	25.00 (17.00-34.75)	20.00 (10.00-25.00)	<0.001*
ODD	7.00 (4.00-14.00)	6.00 (2.00-11.00)	0.006*
CD	1.00 (0.00-3.00)	0.00 (0.00-2.00)	0.002*

*p<0.05, Instatistical analysis, Wilcoxon-T test was used.

AD: Attention-Deficit, HI: Hyperactivity-Impulsivity, ADHD: Attention-Deficit Hyperactivity Disorder, ODD: Oppositional Defiant Disorder, CD: Conduct Disorder

In females, HI and total ADHD scores decreased significantly after the pandemic, whereas the decrease in AD, ODD and CD scores was not significant. In males, AD, HI and total ADHD, ODD and CD scores were found to decrease significantly (p<0.05) after the pandemic.

In the 7-11 age group, AD, HI, total ADHD and CD scores decreased significantly compared to the pre-pandemic period, and the decrease in ODD score was not significant. In the 12-18 age group, AD, HI, total ADHD, ODD and CD scores decreased significantly compared to the pre-pandemic period (p<0.05).

23 (25%) of the children diagnosed with ADHD included in the study were not using medication, 56 (60.9%) of those using medication were using methylphenidate, 9 (9.8%) were

using atomoxetine, 3 (3.3%) were using atomoxetine and methylphenidate. AD, HI, total ADHD, ODD and CD scores decreased significantly in children taking medication compared to those not taking medication ($p < 0.05$). The AD, HI, total ADHD and CD scores of the non-medicated group decreased significantly compared to the pre-pandemic period, but the decrease in ODD scores was not significant.

Table 3. Correlation Between Stress Coping Styles and ADHD Subtypes

T-DSM IV- S Subscale Scores	Coping Styles of Stress Scale				
	SCA	SA	HSA	OA	SSSA
	r (p)	r (p)	r (p)	r (p)	r (p)
ADHD-AD	-0.241 (0.054)	0.263 (0.034*)	0.269 (0.030*)	-0.068 (0.592)	-0.034 (0.790)
ADHD- HI	-0.303 (0.035*)	0.310 (0.030*)	0.209 (0.151)	-0.220 (0.129)	0.030 (0.839)
ADHD- total score	-0.270 (0.012*)	0.396 (<0,001*)	0.254 (0.019*)	-0.176 (0.107)	-0.056 (0.612)
ODD	-0.307 (0.030*)	0.422 (0.002*)	0.357 (0.011*)	-0.204 (0.155)	-0.124 (0.393)
CD	-0.293 (0.309)	0.520 (0.056)	0.649 (0.012*)	-0.338 (0.237)	-0.416 (0.139)

AD: Attention-Deficit, HI: Hyperactivity-Impulsivity, ADHD: Attention-Deficit Hyperactivity Disorder, ODD: Oppositional Defiant Disorder, CD: Conduct Disorder

SCA: Self-Confident Approach, SA: Submissive Approach, HSA: Helpless Styles Approach, OA: Optimistic Approach, SSSA: Seeking of Social Support Approach, r: Correlation Coefficient

* $p < 0.05$

Spearman Correlation Analysis was used.

Considering the characteristics of the pandemic, there was not significant difference between ADHD, ODD and CD scores and the frequency with which the child met friends over the Internet during the pandemic, whether they followed online classes, and the change in sleep patterns and time.

13 (14.1%) of the participants had COVID-19 and there was no significant difference in terms of ADHD subtypes, gender, age and medication use compared to the group without COVID-19 infection. There was no significant difference between pre- and post-pandemic scores for AD, HI, total ADHD, ODD and CD in those with COVID-19 infection.

There was no significant difference between OA and SSSA coping mechanisms for stress and any subgroup (Table 3). A significant difference was observed between all subgroups except SA and CD and all subgroups except HSA and ADHD-HI ($p < 0.05$).

DISCUSSION

Our study aimed to investigate the impact of the COVID-19 pandemic on the severity of ADHD, ODD and CD symptoms, to assess their interaction with socio-demographic data and to determine patients' coping mechanisms with stress. In a study by Lee (17), school routines were a supportive and important coping mechanism, especially for children and adolescents with mental health problems. During the pandemic the schools were closed and this protective mechanism disappeared. It has therefore been suggested that patients' symptoms may have increased. In another study, it was emphasized that as a result of the closure of schools due to COVID-19 restrictions, children and adolescents with ADHD may suddenly cease their relationships with classmates, which may lead to adaptation problems and this feeling of

Loneliness may negatively affect mental health (17,18). However, our study found a significant decrease in the severity of ADHD, ODD and CD symptoms during the pandemic. One study suggested that the increase in well-being of children with ADHD during the quarantine period may be due to a reduction in school-related anxiety, parents' flexibility in adapting to their children's rhythms, and increased awareness of their children's daily difficulties.

Similar to our findings, this study found that attention problems were improved. This situation was associated with a more suitable home environment for learning. It is suggested that the absence of the excessive stimuli of the classroom environment in the home environment may have led to a reduction in inattention and impulsivity during the quarantine period, and that a flexible study program designed to take account of the child's fatigue status, the presence of both parents to help with homework, and personalized help for the child increased the child's success at school. It has been noted that as a result of the reduction in time constraints caused by school, longer, more consistent and better quality time may have been spent with family, which may have strengthened family relationships and led to a reduction in symptoms of ODD and CD (19). Similarly, in our patients, family relationships were strengthened during the pandemic, which may have led to a decrease in the symptoms of ODD and CD.

A study conducted by Dvorsky et al (20) found that, contrary to what was expected, young people with ADHD were less distressed by COVID-19 than their peers without ADHD. The fact that young people with ADHD experience emotion regulation disorder has been found to be related to co-diagnosis (21). It has been reported that while emotion regulation disorder may be a risk factor for psychopathology, well-developed emotion regulation capabilities may also serve as an essential buffer against chronic stress (22). The fact that most of the patients participating in our study are currently taking medication and continuing their regular follow-up appointments in the last year before the pandemic may have prevented ADHD symptoms from being adversely affected as a result of resolving their emotion regulation problems and reducing their anxiety levels. Despite the negative effects of the pandemic and increased risks, some factors, such as flexibility and increased time spent with family, less exposure to negative peer interactions at school, suggest that children and adolescents with ADHD may also experience positive effects in some areas during the COVID-19 pandemic (23). In particular, home-based education may remove some of the school-related stressors, such as frustration and social difficulties resulting from failure, that children and adolescents with ADHD often experience (24,25). In our study, the fact that clinical symptoms decreased in children and adolescents with ADHD suggests that patients may have experienced positive effects for similar reasons. In addition, the fact that 78.3% of our participants did not attend online classes and 43.5% spent time on the Internet in their spare time suggests that an uncontrolled environment may have developed at home and that children/adolescents may not have been forced to engage in boring activities such as listening to lectures and studying. In addition, the exclusion of patients with comorbidities such as major depressive disorder and anxiety disorder from the study and the continuation of the follow-up and treatment process in our clinic, albeit online, may have played a role in the reduction of symptoms. Although patients experienced some positive effects during this period, it is likely that continued school attendance is as important for children with ADHD as it is for other children. Contrary to the results of our study, many published studies have shown that the severity of ADHD symptoms increased during the COVID-19 pandemic (22,26). These studies show that pandemic-related disruptions in daily routines and stay away from life activities significantly exacerbate the impairment in functioning experienced by individuals with ADHD (27). Reduced exercise and time spent outdoors, less enjoyment of activities performed and increased screen time have been associated with the development of negative mood (28).

In their guidelines on the assessment and management of ADHD during the COVID-19 pandemic (27), the European ADHD Guideline Group stated that if individuals with ADHD are clinically diagnosed following an appropriate assessment, they should be started on treatment or continue taking medication if they are already on medication. Given that COVID-19 restrictions and physical distancing can increase the risks associated with ADHD, it is reported in the guideline that there is no need for a drug holiday during the current crisis period. In our patients, drug treatment was continued in a similar way, necessary dose adjustments were made by continuing drug treatments with online interviews during the most severe periods of the pandemic, patients' access to medication was facilitated, and drug holidays were not recommended to patients in accordance with the guidelines. As a result of our study, it was found that patients taking medication during the pandemic period showed significant improvement in ADHD, ODD and CD symptoms compared to the pre-pandemic period, and patients were in relatively good condition.

Understanding the factors that improve resilience, particularly in individuals with neurodevelopmental disorders, and thus prevent the negative psychological impact of COVID-19, is critical to facilitating individuals' adaptation to their current situation and reducing risk (20). Based on this perspective, our study investigated the coping mechanisms used by children and adolescents with ADHD to cope with stress. In a previous study, individuals with ADHD were found to use significantly more maladaptive and less flexible coping mechanisms than controls (29). As ADHD severity increases, the likelihood of using adaptive coping mechanisms for stress such as distraction, minimization, self-glorification by comparing with others, and seeking social support decreases, while the risk of using maladaptive coping mechanisms for stress, such as avoidance and social withdrawal increases (30). Dvorsky et al (20) found that adolescents with ADHD used adaptive coping behaviors less during the COVID-19 pandemic. In our study, it was found that ADHD-AD patients were significantly more likely to use negative coping mechanisms for stress, such as submissive and helpless approaches. This may be due to the fact that patients in this group were calmer, less intrusive and more introverted than those with ADHD-HI, ADHD-total, ODD or CD. Although it was observed that both positive and negative coping mechanisms were used together in patients with ADHD-HI, ADHD-total and ODD, it can be thought that the methods used contradict each other. This may be due to the age difference between the patients included in the study and the fact that the young age group's ability to cope with stress had not yet developed. The fact that patients co-diagnosed with CD were significantly more likely to use the helplessness approach suggests that they were blaming themselves for the problems they were experiencing and looking for outside help rather than seeking a solution. In addition, our study found that the least used methods by patients were the optimistic approach and seeking social support. The lack of an optimistic approach shows that the patients exaggerated when trying to solve the problems and they were angry about the events, they looked at the events from a negative angle and they did not treat themselves tolerantly. The absence of seeking social support means that they did not share their problems with others. Failure to use these methods may be due to previous negative experiences of patients such as being labelled in social settings, difficulty in making friends, not finding the support they expected when seeking social support, and fear of negative feedback/criticism.

A study of children and adolescents diagnosed with ADHD in France during the quarantine period assessed the impact of the COVID-19 pandemic on the psychological well-being of children and adolescents. This study reported that children and adolescents had fewer difficulties due to school closures during the quarantine period, their anxiety about school was reduced, and there was no deterioration in their general well-being (19). In addition, the fact that ADHD symptoms were more likely to be observed in the classroom environment and that

less negative feedback was received from teachers and friends as a result of school closures may have supported this situation. According to our results, in particular, ADHD symptoms decreased significantly during the pandemic period in both the child (7-11 years) and adolescent (12-18 years) age groups, and there was no significant difference in coping mechanisms. This situation also suggests that patients with ADHD in both age groups have adapted well to the pandemic period.

Limitations of our study include the cross-sectional nature of the study, the lack of a control group, diagnoses not made by semi-structured interviews such as the K-SADS-PL, scores based on parental report only, and ADHD symptoms not measured by neuropsychological tests.

CONCLUSION

In conclusion, children and adolescents with ADHD are particularly at risk when adapting to chronic stressful situations such as the COVID-19 pandemic. Therefore, the importance of teaching adaptive coping strategies and establishing consistent daily routines is emphasized to increase resilience in these individuals (20). The researchers' literature review did not find a similar study conducted during the pandemic. Therefore, it is expected that the results of our study will contribute to the literature. In addition, it is predicted that our study may be essential to draw attention to the assessment of coping mechanisms and the development of healthy practices among ADHD patients and their parents who sought assistance from child and adolescent mental health outpatient clinics.

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