

Changes in Symptoms and Severity of Obsessive Compulsive Disorder in Children and Adolescent Patients following the Covid-19 Pandemic

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ABSTRACT

The need to stay at home and follow the rules of personal hygiene for protection are generally stimuli that can increase the anxiety of obsessive compulsive disorder (OCD) patients during covid-19 pandemic. The aim of this study was to examine how this situation has changed the disorder severity and symptoms in OCD patients. This multi-centre study included 73 OCD patients aged 7-17 years, who had been followed up for at least 8 weeks before the pandemic. The range and severity of symptoms were evaluated with the Children's Yale-Brown Obsessive Compulsive Scale (CYB-OCS). The disorder severity scores evaluated in the 8th week of treatment were compared with disorder severity scores after the pandemic, and a statistically significant difference was determined ($p=0.04$). There was seen to be an increase in contamination, illness and sexual obsessions after the pandemic compared to the 8th week of treatment. The study results showed that pandemic-origin stress had a negative effect on young OCD patients. There should be advance planning of how treatment processes will not be interrupted and how children with mental health problems can be helped in times of stress, such as natural disaster and pandemics, which affect the whole population and therefore, children.

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Introduction

Obsessive compulsive disorder (OCD) has a prevalence of approximately 4% and is characterised by various compulsions and obsessions, which make a contribution ranging from mild to severe to the quality of life of the individual¹. Environmental factors are just as important as genetic factors in the development of OCD symptoms, and as a priority there is ongoing research to identify these factors². The effect of stressors has been investigated, including physical abuse, sexual abuse, exposure to regular bullying, exposure to extreme poverty, and lack of social security².

The Covid-19 pandemic has affected the whole world, in accordance with the definition of a pandemic, and is a disease outbreak forming a severe element of unease in the context of the rapid spread and possible fatal results. It is accepted that everyone is at risk of becoming infected in almost equal conditions. Therefore it can be evaluated as an equal stressor. However, individuals with psychiatric diseases may be more affected by emotional responses to the Covid-19 pandemic, and because of their predisposition to high stress compared to the general population, there may be exacerbation or recurrence of a pre-existing mental health condition³.

It has been reported that psychiatric patients are disadvantaged in respect of protection against infection³. It may also be thought that the treatment of psychiatric comorbidities related to Covid-19 may be more difficult and become less effective⁴. The Covid-19

pandemic has caused fear, anxiety and depression in parallel with the outbreak³. Furthermore, since the first cases reported in Turkey, the increasing media reports and increasing numbers of cases may have increased anxiety in society⁵. The decisions for quarantine will also significantly increase concerns⁵. Similar studies have shown that quarantine causes worsening of OCD symptoms⁶. However, longitudinal studies have suggested in the literature to investigate how the OCD clinic is affected by the pandemic⁷.

Of the precautions taken, the measures taken against contact and spread of the infection of attention to hygiene, frequent hand washing and wearing a mask can increase the obsessions of patients with contamination obsession. Functionality can be more impaired with an increase in cleaning compulsions. Obsessions are known to trigger compulsions to minimize anxiety caused by unreasonable fears¹. Therefore, when obsessions increase, compulsions can be expected to increase, and it will be more difficult for the patient to regain insight against irrational anxiety. There are few studies on how this fear affects children and young people. A study conducted in Israel with many limitations showed that the ocd symptoms in children and adolescents were not affected by the first wave of the pandemic⁸.

Community-based studies have shown that there has been an increase in hygiene and avoidance behaviours. Using the Angus Reid questionnaire, a study of 1354 healthy individuals in January 2020 in Canada showed that since hearing of the disease outbreak, 3% of the participants bought a facemask, 41% washed their hands more

frequently, 4% avoided using public transport and 12% avoided public places⁹. Of course, not only concerns about bodily waste and secretions may increase contamination obsessions, but also the worry of becoming ill because of contamination and concern about how they will feel during contamination. An increase may be seen in fear of illness or harm coming to oneself or relatives obsessions such as worry that they could spread the disease to others and that they could harm others. Thus, there may be a change not only in the severity of the disorder, but there may also be changes in obsessive symptoms.

Especially in periods of pandemic, patients may experience serious problems in presenting at hospitals. Therefore it is important that patients are followed up by a tele-psychiatrist with telephone or virtual environment consultations¹⁰⁻¹². The aim of this study was to evaluate child and adolescents who followed up due to diagnosis of OCD, to determine whether there was any change or not in symptoms and severity after the Covid -19 pandemic compared to the period before the pandemic. The fact that it is a multicenter study with wide participation in which the changes of the patients followed up before the pandemic can be objectively examined in children and adolescents makes this study valuable.

Method

Study sample and data collection

In this multi-centre study, the study sample was taken from 3 different provinces in the east, west and centre of Turkey, child and adolescent units of Ağrı State Hospital, Kutahya Health Sciences University and Aksaray University Faculte of Medicine respectively. The sample was formed of patients who were being followed up in children and adolescent psychiatry outpatient clinic because of OCD. Specialist working in these 3 centers were researchers who completed their residency training at the same faculty. For this reason, they evaluated the patients in a similar way. In addition, CYB-OCS evaluation was routinely performed for every OCD patient who applied to the clinic to create a database. These previously collected data were used after the pandemic. Diagnosis of OCD was made according to DSM-5 criteria by clinical interviews with child and parents. In these 3 pediatric psychiatry clinics, when a diagnosis of OCD was considered, the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS) was applied to patients and follow-up was made accordingly. The Schedule for Affective Disorders and Schizophrenia for School Age Children- Present and Lifetime Version, DSM-5 (K-SADS-PL) applied to every patient at first session of treatment.

When the first Covid-19 case was recorded in Turkey (11 March 2020), precautions against the pandemic were rapidly implemented. One of these precautions was the restriction of non-emergency patients presenting at hospital. Therefore, as recommended, the patients being followed up in outpatient clinics were contacted by telephone, and the evaluations and follow-up after the outbreak of the pandemic were continued in this way¹². Within the context of the Covid-19 pandemic precautions, procurement of medications was facilitated for patients so that they could obtain their regular drug treatments from pharmacies without seeing a doctor.

Data related to the patient age, presence of stressors, treatment duration, presence of comorbidities, and treatments used were obtained from the hospital information management system, the national social security system, the Ministry of Health online personal health management system, and the manually recorded follow-up records¹³⁻¹⁵.

The socioeconomic level (SEL) were classified into 3 groups as

low, moderate and high and scored accordingly: parental education level, parental employment status, monthly household income level, the presence in the home of a washing machine, dishwasher, computer and other technology devices, and whether or not the child benefited from education. When all values are scored, they are divided into 3 groups as low SEL, moderate SEL, high SEL. Psychosocial stressors were accepted as difficult life conditions such as separated parents, mother or father working far from home, exposure to peer bullying, exposure to physical violence and the loss of a loved one.

Study procedures

The participants were drug-naive when they were first examination. During first 8 week period patients were applied both psychotherapy and pharmacological treatment. 8th week examination was second examination in this study. During the covid-19 pandemic examination was included to the study as third examination. For this research patients were evaluated by face to face during first 8 weeks. The reason for this is to be able to examine the change that the covid pandemic has made on patients' symptoms after the treatment begins to take effect. Exclusion criterias for the study group are mental retardation, autism spectrum disorder, psychotic disorders and patients who have been treated for less than 8 weeks.

Approval for the study was granted by the Non-Interventional Ethics Committee of Aksaray University with number 2020/05-01.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 23.0 for Windows software (SPSS Inc., Chicago, IL, USA). The normality of the data distribution was tested with the Shapiro-Wilk test and was found to be normal. The Paired Samples t-test was used to compare the averages of the observed values of a variable in two different conditions. The Chi-square test was used to compare the mean values of categorical variables between the two groups. Pearson correlation analysis was applied to estimate the linear relationship between continuous variables. Binary Logistic regression analysis was used to determine the predictive effect of independent variables on dependent variables. A value of $p < 0.05$ was accepted as statistically significant.

Materials

The Kiddie-schedule for affective disorders and schizophrenia for school-age children, present and lifetime version (K-SADS-PL-DSM5), which is a semi structured interview was developed by Kauffman et al.¹⁶ The initial reliability and validity data of this scale in Turkey was carried out by Ünal et al¹⁷.

The Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS), developed by Goodman et al in 1986, is a semi-structured questionnaire based on clinical interviews¹⁸. The evaluation is made according to the clinical judgement of the interviewer based on the information given by the child and the parents. A total severity score is obtained from the total of the obsession severity points and the compulsion severity points. An inter-observer reliability study of the scale in a Turkish sample was published by Yücelen et al¹⁹.

The national social security system is an automated system providing transfer of invoice information and payment of invoices to facilities for the provision of healthcare services to those who are insured and entitled in the context of the general health insurance. On this system, clinicians can monitor whether patients have obtained drugs from the pharmacy and on which dates they have obtained which doses of drugs¹⁴.

The Hospital Information Management System is an integrated system which manages all the healthcare institutions and facilities throughout Turkey, storing costs and medical information shared

with the systems of units and external stakeholders supervised by the Ministry of Health¹³.

The e-Nabiz system is an application which can be accessed on the internet and mobile devices by citizens and healthcare professionals of the health data collected by healthcare institutions. It is a personal health records system, in which the medical history can be accessed from a single place and physicians can manage all the health information, regardless of where examinations, tests and treatments have been applied. In the framework of time and restrictions authorised by the patient, the healthcare records can be evaluated by physicians, and thus it is an extensive and comprehensive healthcare infrastructure, which can be safely accessed on the internet, providing a strong communication network between patient and physicians, increasing the quality and speed of the diagnosis and treatment process¹⁵.

Results

Table 1 summarizes the study groups' demographic and clinical variables. The study included 73 cases, comprising 49.3% males and 50.7% females with a mean age of 12.82 years ($M=12,82$, $SD=2,72$). The socioeconomic level 1 was determined as low in 19.2% of cases, moderate in 58.9% and high in 21.9%. A comorbid psychiatric disorder was determined in nearly half (52.1%) of the patients. A history of life difficulties before treatment which could be said to be psychosocial stressors was determined in 26% of the patients. The results of the regression analysis showed no relationship between gender and psychosocial stressors before the disorder ($\beta=-179$, $p=.737$, 95%CI: 0,29-2,38). The time from onset of disorder symptoms to diagnosis (duration of illness) was mean 11.27 months ($SD=5,90$, min:4- max:36 months). The duration of treatment after diagnosis was mean 6.39 months ($SD=2,91$, min:3-max:16 months).

Examining the change in disorder severity: CY-BOCS severity scores were used to understand the change in disorder severity. In the comparison of the CY-BOCS severity points at the time of diagnosis before treatment and in the 8th week of treatment, there was a statistically highly significant difference in the CY-BOCS severity points ($p<0.001$, $t=21.58$). A statistically highly significant difference was determined in the total CY-BOCS

severity points following the Covid-19 pandemic compared to the pre-treatment points ($p<.001$, $t=10,61$). The difference between the CY-BOCS severity points during the Covid-19 pandemic compared to the evaluation in the 8th week of treatment was determined to be statistically significant ($p=.004$, $t=-3,01$) When the relationship between the presence of stressors and disorder severity was examined, no significant relationship was found when the first diagnosis was made ($t=.307$, $p=.76$) and during the covid pandemic ($t=.677$, $p=.50$). No statistically significant correlation was determined between the duration of illness before diagnosis and disorder severity in the period after the Covid-19 pandemic ($r(71)=.58$, $p=0.62$). (Figure 1).

All the patients were taking at least one pharmacological treatment, and 31.5% were taking a combined pharmacological treatment. Of these 30.1% were taking sertraline and 61.7% fluoxetine, 8.2% clomipramine, 21.9% atypical antipsychotics, 6.8% aripiprazole, 15.1% risperidone, 5.5% of patients were taking methylphenidate and 4.1% atomoxetine. However, there was no statistically significant relationship between whether the combined psychopharmacological treatment used by the patients and the change in symptom severity after pandemic ($t = -1.03$, $p = .30$).

Examining the relationship between treatment efficiency and relapse after covid-19: "Treatment efficacy" refers to the patients' CY-BOCS total scores after 8 weeks of treatment. A positive correlation was determined between the CY-BOCS total scores at 8 weeks of treatment and after the outbreak of the Covid-19 pandemic ($r(71) = .43$, $p<.001$). Considering that there may be a relationship between the duration of treatment and relapse, when we examined whether the severity will increase during the pandemic as the duration of the treatment increases, no statistically significant correlation found between the duration of the treatment and the severity of the symptom during the pandemic. ($r(71) = .64$, $p= .59$) (Figure 2)

Examining the change of symptoms with during the covid-19 pandemic: When evaluations were made of how symptoms changed over time, obsessions related to contamination were in 86.3% of patients before treatment, and this receded to 67.1% in the 8th week of treatment and increased to 87.7% during the Covid-19 pandemic. Sexual obsessions were in 12.3% of the patients before treatment, in 4.1% in the 8th week of treatment, and in 8.2% during

Table 1: Sociodemographic Characteristics of Participants at Baseline

Sociodemographic Characteristics						
Gender	n			%		
	36			49,3		
	37			50,7		
Girl Total	73			100		
Age	Minimum age (year)		Maximum age (year)		(Mean ± St.D.)	
	7		17			
	8		17		12,47 ± 2,55	
Boy	8		17		13,16 ± 2,86	
Girl Total	7				12,82 ± 2,72	
Socioeconomic level (sel)	Low		Moderate		High	
	n	%	n	%	n	%
	14	19,2	43	58,9	16	21,9
Presence of psychosocial stressor	Yes			No		
	n	%		n	%	
	19	26,02		54	73,98	
Comorbid psychiatric disorder	Yes			No		
	n	%		n	%	
	38	52,05		35	47,95	

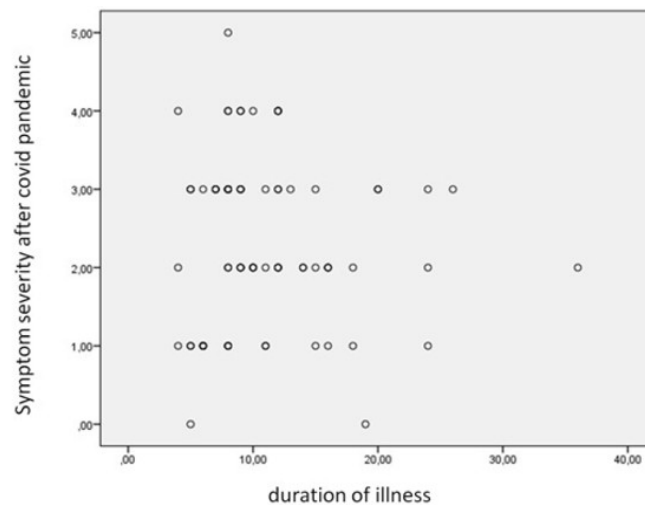


Figure 1. Correlation between duration of illness (weeks) and CY-BOCS symptom severity during the pandemic ($p=0.62$, Pearson coefficient $r=0.58$).

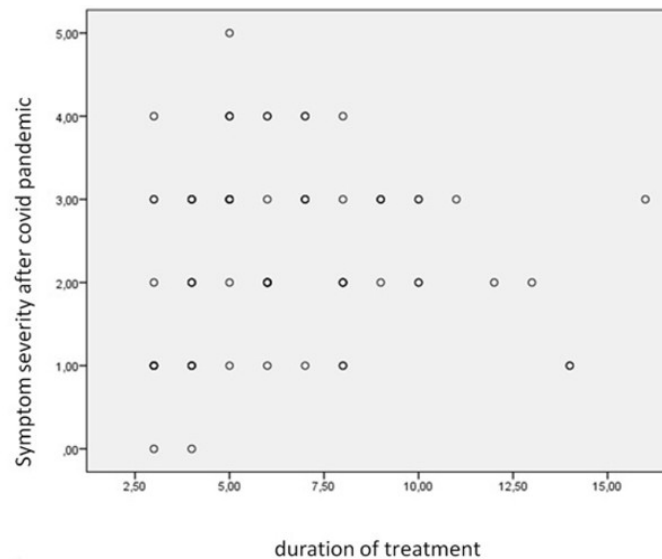


Figure 2. Correlation between duration of treatment (weeks) and CY-BOCS symptom severity during the pandemic ($p=0.59$, Pearson coefficient $r=0.64$).

the pandemic. Other obsessions decreased over time. The changes in symptoms of obsessions are given in Table 2.

In addition to these, it was also examined whether the change in symptom severity was different in age groups. When we compare the general severity of symptoms according to age, we can consider childhood and adolescence as before and after 10 years of age. Symptom severity changed after treatment was observed similarly before and after 10 years of age. In both age groups, the symptom severity decreased considerably with treatment, and there was increase in the symptom severity during the pandemic. However, while the increase in disorder severity during the covid pandemic in the group before the age of 10 was not statistically significant ($t = 1.31$, $p = .26$); this increase was statistically significant in the group older than 10 years ($t = 2.69$, $p = .009$) Symptom severity distributions during the pandemic by age are given in table 3. (Table 3).

When comorbid diseases are examined; no comorbidity was determined in 47.9% of the patients, and generalised anxiety disorder was determined in 11%, attention-deficit hyperactivity disorder in 9.6%, tic disorder in 6.8%, social anxiety disorder in

6.8%, panic disorder in 2.7%, depressive disorder in 2.7%, specific learning disorder in 2.7%, separation anxiety disorder in 2.7%, trichotillomania in 2.7%, oppositional disorder in 2.7%, and enuresis nocturna in 1.4%. Comorbidity in patients is shown in detail in Table 4. (Table 4).

Discussion

A pandemic period is a situation in which it can be predicted that there will be an increase in mental disorders and symptom severity together with the stresses created by the change in daily routine and having to stay at home²⁰. In addition, it can be considered that in the context of the disease outbreak, the predominance of the subjects of cleaning, avoiding contact, protection against contact with the virus, disease and death, will increase the contamination obsessions of children with OCD²¹. The results of this study generally support this view. An increase was determined in both disorder severity and contamination obsessions and compulsions like cleaning symptoms. There are similar data in literature²²⁻²⁴. In twin studies, it has been shown that stressful life events and environmental factors

Table 2: Distribution of obsession types in the first examination, in the 8th week examination and during the pandemic

Types of obsession	Number of obsession types determined in the first examination	Number of obsession types determined in the 8th week examination	Number of obsession types determined during covid-19 pandemic examination
Offensiveness	14	10	2
Contamination	61	49	64
Sexual	14	6	7
Hoarding	4	1	0
Religious	13	7	3
Simetry	13	7	6
Somatic and others	18	11	7
Total	137	91	89

For more than one obsession may had been in a patient, all obsessions in the first examination, 8th week examination and examination during the pandemic were scored. Contamination obsession is the most common type of obsession. While 61 people had contamination obsessions in the first examination, it was determined that contamination obsessions continued in 49 people in the 8th week. However, during the pandemic, contamination obsessions increased again and reached 64 people. In fact, it is possible to say that contamination obsession have been in 3 people who had not contamination obsessions before the pandemic.

Table 3: relationship between age and symptom severity

	Age	Symptom overall severity scores (symptom severity)													
		0		1		2		3		4		5		6	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Symptom severity (overall severity of symptoms)in the first Examination (1st examination)	≤10 year (n:17)	0	0	0	0	0	0	7	41,2	9	52,9	1	5,9	0	0
	>10 year	0	0	0	0	0	0	22	39,3	23	41,1	9	16,1	2	3,6
	(n:56)														
Symptom severity (overall severity of symptoms)in th 8th week examination (2nd examination)	≤10 year (n:17)	0	0	2	11,8	14	82,4	1	5,9	0	0	0	0	0	0
	>10 year	4	7,1	7	12,5	33	58,9	11	19,6	1	1,8	0	0	0	0
	(n:56)														
Symptom severity (overall severity of symptoms)During the covid-19 pandemic (3rd examination)	≤10 year (n:17)	0	0	4	23,5	6	35,3	6	35,3	1	5,9	0	0	0	0
	>10 year	2	3,6	12	21,4	16	28,6	17	30,4	8	14,3	1	1,8	0	0
	(n:56)														

The relationship between symptom severity and age according to the age distribution of patients

CYB-OCS is a likert type scale. Overall severity is scored from 0 to 6. 0 was scored as the lightest, 6 as the heaviest. This table shows how the overall severity level varies by age at the 1st, 2nd, and 3rd examination. Around 10 years old is the age at which OCD's first peaks. However, it can be considered as early adolescence after 10 years of age. For this reasons, a table was created by separating patients under 10 years of age and above.

Table 4. Psychiatric comorbidities in the first examination

	N	%
GAD	8	11,0
SAD	5	6,8
Panic Disorder	2	2,7
ADHD	7	9,6
Depressive disorder	2	2,7
Learning Disorder	2	2,7
Seperation anxiety	2	2,7
Tic disorder	5	6,8
Trikotillomani	2	2,7
Enürezis nokturna	1	1,4
ODD	2	2,7
Total	38	52,1

GAD: generalize anxiety disorder, SAD: social anxiety disorder, ADHD: attention deficit hyperactivity disorder, ODD: oppositional defiant disorder

could play a role in the development of obsessive compulsive symptoms^{22,23}. There are also data demonstrating an increase in obsessiveness and intrusive thoughts with exposure to acute stress, even in healthy individuals²⁴.

It has been reported that a low socioeconomic level could be a risk factor for the development of OCD². In the current study no significant correlation was determined between socioeconomic level and the increased intensity of OCD symptoms following the pandemic. Further research of how families of high and low socioeconomic levels are affected by the stress that emerges in the visual media and social media with a pandemic, and details of the changes in OCD symptoms in these families would provide important data in this field.

Almost half of the children in this study had a comorbid disorder. Consistent with previous information in literature, the most frequent comorbidities were determined to be anxiety disorder, ADHD, tic disorder, depressive disorder and trichotillomania^{1,25}. These data are of value in respect of strengthening the characteristic that this study group represents an average OCD group.

From the moment of the outbreak of Covid-19, many studies have been made of the psychiatric effects, primarily in China. In a study conducted in a Chinese city that was greatly affected, an increase in PTSD was reported, and it was determined that females were more affected by this increase²⁶. A questionnaire survey conducted in China where the pandemic originated reported from a large sample that females were exposed to more stress than males. In the same study, there was determined to be a lower rate of stress responses in children below the age of 18 years compared to adults¹². On the basis of these data, a difference may be seen between the genders in respect of the change in the level of anxiety. But in the current study, no difference was determined between the genders in respect of the changes in OCD course.

Just as stressful life events can trigger OCD, it is also known that they affect disorder severity²⁷. The rate of psychosocial stressors in cases in the current study (26%) was seen to be lower than rates in literature (67%)²⁸. As previously stated, stressors have been reported to affect females more, and it has been determined that contamination symptoms are more affected and that stressors play a greater role in the etiology of cases with later onset²⁹. In the current study, the psychosocial stressor rate was equal between the genders before the disease, and no correlation was determined between the increase in symptoms that occurred after the pandemic and previous stressful life events. Similarly, no relationship was found between the type of symptoms and previous psychosocial stressors.

Consistent with the literature, a significant increase was determined in contamination obsessions in the current study. As shown in our study, contamination obsession may increase due to traumatic reasons such as the covid 19 pandemic. If the patient's contamination obsession increases throughout the covid 19 pandemic, it may be more important to address this traumatic situation in therapy rather than changing drug doses. Increasing the capacity of patients to cope with psychosocial stressors will provide better control of contamination obsessions. According to the results of the current study, it can be said that however good the improvement was in the 8th week of treatment, this well-being may deteriorate when a stressor is encountered.

As expected in the current study cases, the most frequently used drug group was SSRIs and the agent most used was fluoxetine. At the same time, these cases were being followed up with a cognitive behaviour-based therapeutic approach applied with a varying number and regularity of sessions. No statistically significant difference was determined when the intensity of

symptoms seen after the pandemic was examined in respect of the psychopharmacological agent prescribed for OCD, the cognitive behaviour-based therapy and the frequency of seeing the physician.

However, while there was a high probability of increased symptoms related to contagion and disease following a stressor awakening fears of contamination and disease such as the pandemic, it was interesting that a partial increase was seen in those with sexual obsession. Despite a decrease from 12.3% to 4.1% in the 8th week with treatment, sexual obsessions increased again to 8.2% after the pandemic. This can be interpreted as symptoms which have not been fully treated can regain strength even in the presence of a stressor considered to be unrelated.

Although there was a statistically significant increase in disorder severity and the intensity of symptoms in children with OCD together with the pandemic, it did not reach the level of the pre-treatment period. This demonstrates that even if a good treatment course is disrupted by stressful periods, generally the good status continues. Knowing that functions will not deteriorate to the level of the initial period, even if exposure of children to other stressors worsens the OCD, and sharing this information with the family could be an important factor in treatment³⁰. Nevertheless, there is a need for further long-term studies to evaluate whether the deterioration in the stressful period remains permanent.

Conclusion

The results of this study showed that there were negative effects of pandemic-related stress in young OCD patients, independently of gender, type of treatment, age, time from onset of the disorder to diagnosis, history of psychosocial stressors and socioeconomic level. Patients who were followed up with OCD did not return to their pre-treatment conditions during the pandemic. But they lost some of the gains from the treatment.

There should be forward planning to establish how children with mental health problems can be helped and how treatments can be maintained without disruption in times of stress such as pandemics and natural disasters which affect all of society and therefore, children.

Limitations

Although this study showed that OCD symptoms increased in children in times of stress and a period of viral pandemic which involves the whole of society, it did not include data of whether or not this effect continues. There is a need for further long-term extensive studies with long-term follow-up of cases whether not to determine the effect of remaining away from school and daily routines, or a family member contracting the virus on disorder severity and symptom distribution.

However, not working with a control group prevented us from seeing the true placebo effect³¹. This could affect the results of the study. Although we included those who received treatment in the study, the fact that OCD was not treated sufficiently or the presence of resistant OCD cases may have affected the results of the study³².

It is not known why some children with OCD are not negatively affected by the stress created by the processes related to the pandemic. Studies to reveal this would contribute to the field of preventative mental health.

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