

# Changes in Symptom Severity among Children and Adolescents with Obsessive-Compulsive Disorder during the COVID-19 Pandemic: A 2-year Follow-up

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## ABSTRACT

**Background:** The coronavirus disease 2019 (COVID-19) pandemic caused significant global turmoil, including changes in social and societal conduct such as lockdowns, social isolation, and extensive regulations. These changes can be major sources of stress. The first wave of the pandemic (April–May 2020) was a time of global uncertainty. We evaluated symptom severity among 29 Israeli children and adolescents with obsessive-compulsive disorder (OCD). Our previous study found that most of these participants did not experience an exacerbation of symptoms.

**Objectives:** To re-evaluate the OCD symptoms of 18 participants from the original group of 29 children and adolescents during three time points: before the pandemic, during the first wave, and 2 years later.

**Methods:** Obsessive-compulsive symptoms (OCS) were assessed using the Clinical Global Impression Scale (CGI), a functional questionnaire, and the Obsessive-Compulsive Inventory-child version (OCI-CV).

**Results:** OCS in patients did not change significantly during the three time points. Participants reported minimal changes in their general functioning 2 years after the outbreak of COVID-19 and showed minimal change in OCI-CV scale scores.

**Conclusions:** Our results indicated clinical stability of OCD symptoms among most of the participants.

*IMAJ 2024; 26: 8–11*

**KEY WORDS:** adolescents, children, coronavirus disease 2019 (COVID-19), exacerbation, obsessive-compulsive disorder (OCD)

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The coronavirus disease 2019 (COVID-19) pandemic triggered comprehensive safety measures including varying degrees of lockdown, quarantines, hygiene recommendations, and preventive regulations. The implementation of these safety measures, in addition to the fear of infection led to increased stress, isolation, and disruption of both school and recreational activities. These changes

affected patients who presented with psychiatric disorders, which caused deterioration due to reduced availability of mental health services [1]. Specifically, symptoms of individuals with obsessive-compulsive disorder (OCD) may have been exacerbated due to the fear of contamination, viruses, and germs [2]. These symptoms were further exacerbated by their impaired goal-directed control, cognitive inflexibility [3], and fear of inner corruption [2]. We hypothesized that these patients would be more susceptible to deterioration during the COVID-19 pandemic. This belief was supported by several studies of both adult [4–7], and pediatric populations [6,8–10].

In our previous study [11], we investigated the impact of the first wave of the COVID-19 pandemic on children and adolescents with OCD. Our findings showed that during that time, Israeli children and adolescents with OCD coped well with COVID-19 and did not experience an exacerbation of OCD symptoms. We theorized that our results could be temporary and attributed to decreased social and academic expectations, normalization of contamination fear, and a relatively high percentage of participants who continued to receive treatment [8,10]. Therefore, we hypothesized that as society returns to a normal routine, OCD symptoms of these children and adolescents might worsen again.

In the current study, we evaluated the long-term effects of the pandemic on our participants in the context of the revocation of almost all COVID-19-related regulations in a vaccinated population.

## PATIENTS AND METHODS

### PARTICIPANTS

Our study cohort included all the children and adolescents who participated in the previous study [11]. We approached all 29 participants who participated in the first study. The

participants consisted of children and adolescents with OCD and without psychotic disorders, substance abuse disorders, autism spectrum disorders, or intellectual disabilities. They were first evaluated between 15 April 2020 and 5 May 2020 and were approached again between 15 April 2022 and 15 May 2022, to participate in the follow-up study. All participants in this study were of Jewish descent.

## ASSESSMENT

The tools and procedures for study assessments are described in detail in our previous publication [11]. Briefly, diagnoses of OCD and co-morbid disorders were established following a thorough clinical assessment based on the Diagnostic and Statistical Manual version 5 [12]. The severity and improvement of obsessive-compulsive symptoms (OCS) were assessed using the Clinical Global Impression-severity scale (CGI-S) and the Clinical Global Impression-improvement scale (CGI-I) [13], respectively. For each participant, we compared CGI-S scores based on interviews at three different time points: before the COVID-19 outbreak (retrospective), during the outbreak, and 2 years later. The CGI-I scale and OCS (measured by the Obsessive-Compulsive Inventory-child version [OCI-CV] [14]) scores were compared between two time points: during the outbreak of COVID-19 and 2 years later.

To assess a participant's subjective feelings of functioning, we modified the items used by Sasson and colleagues [15]. The question we asked was, "Compared to your condition during the first outbreak of COVID-19, how would you assess your level of functioning?" Scoring ranged from 1 (lack of functioning) to 7 (excellent functioning).

## PROCEDURE

The follow-up phase of this study was conducted after the COVID-19 vaccination was available for the pediatric population in Israel. The percentage of Israeli vaccinated children and adolescents ranged from 23% (5–11 years) to 67% (12–15 years) to 77% (16–19 years). Interviews were conducted via phone calls. Sociodemographic, psychiatric diagnoses, and medication regimens were collected from participant electronic charts. Informed consent was waived due to the retrospective study design.

## STATISTICAL ANALYSIS

The CGI-S scores from before, during, and 2 years after the outbreak of COVID-19 were compared using a non-parametric Friedman test. The CGI-I scores were classified as improved (scores 1–3), no change (score 4), and deteriorated (scores 5–7). Based on the CGI-I scores, we

calculated the proportion of participants who improved vs. those who deteriorated using McNemar's test. The proportion of participants who presented with a good subjective feeling of functioning vs. poor subjective functioning, according to the single question delineated above, was calculated using the z score test for the two population proportions. Demographic characteristics of the study group and non-participants were compared using the non-parametric Mann-Whitney U test. The relationships between age, gender, OCI-total, CGI-S, CGI-I (binary and continuous score), subjective feeling of functioning, and SSRI use were analyzed using the Spearman Correlation.

## RESULTS

Of the 29 children and adolescents with OCD who participated in the first study, only 18 (62.1%) participated in the current follow-up. Reasons for not participating included: unavailability (5), substance abuse (1), and choice not to participate (5). The demographic and clinical characteristics of the study population are presented in Table 1. We found no significant differences between participants and those who declined to participate in age ( $16.27 \pm 3$  years, range 10–21 vs.  $12.96 \pm 3.57$  years, range 8.2–17.5, respectively) or gender (males/females 10/8 vs. males/females = 3/2, respectively).

The mean OCI-CV scores were in the low-medium range of the scale (mean  $11.56 \pm 10.23$ ). We found no statistically significant differences in CGI-S scores between the current study (3.60), from 2 years ago (3.44), and

**Table 1.** Demographic and clinical characteristics of the study sample

Age in years, mean $\pm$ SD, (range)	16.27 $\pm$ 3.00 (10–21)
Males/females, n (%)	10/8 (55.6%/44.4%)
OCI-CV score, mean $\pm$ SD, (range)	
Total	11.56 $\pm$ 10.23 (0–30)
Doubting/ checking	3.18 $\pm$ 3.43 (0–9)
Obsessing	2.89 $\pm$ 2.74 (0–8)
Washing	1.22 $\pm$ 1.72 (0–6)
Hoarding	0.94 $\pm$ 1.25 (0–3)
Ordering	2.29 $\pm$ 2.41 (0–6)
Neutralizing	0.94 $\pm$ 1.63 (0–6)
SSRIs, n (%)	12 (66.67%)

OCI-CV = Obsessive-Compulsive Inventory-child version, SD = standard deviation, SSRIs = serotonin specific reuptake inhibitors

from before the COVID-19 pandemic (3.22) of the same participants (chi-square 0.23,  $P = 0.88$ ). In addition, there was no significant difference in the subjective feeling of functioning between the first time point (COVID-19 outbreak) and 2 years later, as determined by a two proportions z-test ( $z = -0.68$ ,  $P = 0.49$ ) [Table 2].

At follow-up, the majority of participants ( $n=11$ , 61%) were receiving treatment with selective serotonin reuptake inhibitors (SSRIs) medication. We found that there was a significant gender difference between those receiving SSRI medications to those not receiving them, with a higher proportion of females receiving SSRI medications (Mann-Whitney U 10.5,  $n_1 = 10$ ,  $n_2 = 8$ ,  $P < 0.05$  two-tailed). In addition, we found a positive correlation between females and exacerbation of OCD symptoms during the current investigated period, as measured by the CGI-I scores ( $r = 0.49$ ,  $P = 0.038$ ) and the OCI-CV scores ( $r = 0.48$ ,  $P = 0.046$ ).

Females use of SSRIs were negatively associated with subjective feeling of functioning ( $r = -0.79$ ,  $P < 0.001$ ,  $r = -0.52$ ,  $P = 0.027$ ; respectively). Participants who reported a better subjective feeling of functioning had lower severity of symptoms, as measured by the CGI-S and OCI-CV scores ( $r = -0.69$ ,  $P = 0.001$ ,  $r = -0.75$ ,  $P < 0.001$ ; respectively). In addition, we found a negative association between subjective feeling of functioning to CGI-I scores (lower scores indicated improved OCS), showing that better subjective feeling of functioning was associated with improvement of OCS ( $r = -0.77$ ,  $P < 0.001$ ).

We did not find a significant difference in OCI-CV, CGI-S, or CGI-I scores between participants with co-morbidities and those without co-morbidities.

## DISCUSSION

We conducted a follow-up of children and adolescents with OCD who were assessed at the outbreak of the COVID-19 pandemic and again 2 years later. We provide a unique perspective on the long-term effects of the COVID-19 pandemic on the pediatric OCD population in the context of the revocation of nearly all related restrictive regulations. This study offers a novel long-term perspective, as no other study, to the best of our knowledge, has examined pediatric participants from a highly vaccinated population with nearly no pandemic-related regulations and compared the outbreak of the pandemic to a follow-up 2 years later [4-10, 16,17].

Contrary to our hypothesis, we did not find exacerbation in OCS in the current follow-up. We found no significant difference in disease severity, as measured by CGI-S scores during the study periods: before, during, and 2 years after the first wave of the COVID-19 pandemic in Israel. The severity of OCS, as measured by the OCI-CV total score, remained on the low end of the scale. There was no difference in CGI-I scores between the outbreak of the COVID-19 pandemic period and the current evaluation, 2 years later.

**Table 2.** Evaluations of changes in obsessive-compulsive disorder before, during, and after COVID-19 outbreak in Israel

	Time 1 (before the first wave of COVID-19 pandemic)	Time 2 (during the first wave of COVID-19 pandemic)	Time 3 (2 years after the first wave of COVID-19 pandemic)
CGI-S, mean $\pm$ SD (range)	3.6 $\pm$ 2.14 (1-7)	3.44 $\pm$ 1.15 (2-5)	3.22 $\pm$ 1.7 (1-7)
CGI-I, mean $\pm$ SD (range)		3.4 $\pm$ 4.10 (1-7)	3.06 $\pm$ 2.01 (1-7)
Distribution, n (%)			
CGI-I > 4 (worsened)		6 (21%)	5 (27.77%)
CGI-I < 4 (improved)		13 (45%)	11 (61.11%)
CGI-I = 4 (no change)		10 (34%)	2 (11.1%)
General functioning scores, mean $\pm$ SD (range)		4.83 $\pm$ 1.53 (2-7)	5.55 $\pm$ 1.58 (2-7)
Distribution, n (%)			
Score < 4 (poor functioning)		6 (21%)	2 (11.11%)
Score > 4 (good functioning)		16 (55%)	13 (72.22%)
Score = 4 (average functioning)		7 (24%)	3 (10.3%)

CGI-I = Clinical Global Impression-improvement scale, CGI-S = Clinical Global Impression-severity scale, COVID-19 = coronavirus disease 2019, SD = standard deviation

These surprising findings were supported by a follow-up study conducted on pediatric OCD patients in Australia [9]. That study found that participants evaluated post-lockdown had a significant reduction in symptom severity compared to the severity during lockdowns. Their finding suggests that the return to routine may have mitigated the stress associated with the demands of normalcy, resulting in a low symptom severity score.

Another possible explanation for these findings is that pediatric OCD patients tend to have long-term remissions that can last several years [17]. Therefore, the remission that began during the start of the pandemic may have persisted. Furthermore, the natural progression of pediatric OCD patients might also explain our results, as several studies have shown high remission rates of pediatric-onset OCD in adulthood, especially in treated patients [18].

We found a positive correlation between females and exacerbation of OCS during the study period, similar to some adult OCD studies [7]. However, the correlation is weak, and due to the small size of our sample, it may not have clinical significance. Therefore, future pediatric studies with a larger sample size are necessary for further analysis. Female gender was also positively correlated with the use of SSRIs, which was supported by the nationwide Swedish cohort study [19].

One limitation of our study is the small sample size, which may have limited our ability to detect small effects and differences in our participants. In addition, the OCI-CV demonstrated good internal consistency and good-to-adequate short-term test-retest reliability. However, its convergent validity with the CY-BOCS is fair to poor, and its diagnostic accuracy has not been examined [20]. Last, data on OCS severity were self-reported and are subject to the limitations of such measures.

## CONCLUSIONS

OCS among children and adolescents diagnosed with OCD were not exacerbated during the 2-year follow-up period of the COVID-19 pandemic in Israel. To the best of our knowledge, this study is the only one to assess the course of OCS in children in such a time frame. However, due to the small sample size, further research is needed to confirm our findings.

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