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OCD during COVID-19: Understanding clinical and non-clinical anxiety in the community

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ABSTRACT

The COVID-19 pandemic has created a great deal of anxiety for many individuals. Several papers have noted that individuals with OCD may be particularly negatively impacted by COVID-19, and that the threat of COVID-19 may impact treatment (Banerjee, 2020; Jassi et al., 2020; Sheu et al., 2020). The study presented herein examined OCD-related and COVID-related intrusions in a non-patient sample. Individuals with elevated OCD symptoms reported having both OCD and COVID intrusions at a similar frequency. Further, OCD symptom severity was significantly correlated with the frequency of COVID related intrusions and the amount of distress they caused. However, distress from COVID related intrusions was not significantly correlated with OCD symptom severity. These results shed light on the similarities between reactions to objectively elevated threat and the perceptions of elevated threat experienced in OCD.

1. Introduction

The COVID-19 pandemic has created a great deal of anxiety for many individuals. Information regarding strategies for reducing risk is provided on the news and internet (e.g., frequent handwashing, sanitizing, and wearing face masks). Disseminating information regarding risks and protective behaviors is essential during this public health crisis. Recommendations to address pandemic-related mental health issues have emphasized the needs of vulnerable groups (American Red Cross, 2020; Centers for Disease Control and Prevention, 2020a; Ho et al., 2020; World Health Organization, 2020), but are likely needed for a broader sample.

There is increasing evidence that pandemic-related anxiety is growing in members of the general public. Beginning with the first data from China which showed that COVID-19 related anxiety was common (Wang et al., 2020), there are now many studies from a variety of cultures that replicate the initial findings (Thailand: Goodwin et al., 2020; France: Husky et al., 2020; China: Zhao et al., 2020). Data from the United States showed that approximately 50% of respondents reported anxiety that a family member would be infected (Barzilay et al., 2020). Heightened anxiety is not limited to front-line workers or family members of patients. At least one study has shown that levels of anxiety in non-healthcare workers did not differ from healthcare workers (Barzilay et al., 2020). Elevated anxiety is also not limited to individuals with

pre-existing anxiety disorders (Sher, 2020; Qiu et al., 2020). Efforts to understand pandemic-related anxiety will help us understand whether the negative consequences of the pandemic are maintained over time.

Models of the various anxiety disorders and Obsessive-Compulsive Disorder (OCD) may provide a framework for understanding pandemic-related anxiety. Cognitive-behavioral models of obsessive-compulsive (OC) symptoms and OCD may be particularly useful for several reasons. First, there are clear similarities between pandemic-related fears, contamination fears, and ritualized washing symptoms in OCD (Mataix-Cols et al., 2005; Veale & Roberts, 2014). Indeed, public health recommendations for the pandemic are notably similar to compulsions frequently seen in OCD (e.g., frequent handwashing, sanitizing; Centers for Disease Control and Prevention, 2020b). Framing pandemic anxiety in a similar manner to OCD symptoms may be easier and better received than for some other types of anxiety. OCD is outwardly very recognizable as a mental disorder that is a cause for concern and has been associated with high rates of individuals in the general public recommending treatment-seeking for those who have OCD-like symptoms (Coles & Coleman, 2010). As COVID-19 presents as a pertinent threat, examining individuals' experiences with anxiety related to COVID-19 and OCD-like symptoms is warranted.

The current literature on COVID-19 and OCD centers on the notion that individuals with OCD may be negatively impacted by COVID-19, and how the physical threat of COVID-19 may impact treatment

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(Banerjee, 2020; Jassi et al., 2020; Sheu et al., 2020). There is a lack of data to confirm these concerns and extend to individuals who may be experiencing COVID-19-related anxiety, but do not have an OCD diagnosis. A few studies have been published that exemplify the negative impact of COVID-19 on those with OCD in youth (Seçer and Ulaş, 2020), compared to other anxiety disorders (panic disorder, generalized anxiety disorder, social anxiety disorder; Khosravani et al., 2021). One study made a comparison between clinician-rated OCD severity before and during the pandemic for OCD patients, finding a significant increase in obsession and compulsion severity during the pandemic (Davide et al., 2020). As there seems to be a relative lack of data examining OCD and the impact of COVID-19 over time in clinical and non-clinical individuals, this study aims to understand how COVID-19 is impacting these groups of individuals and whether there is an exacerbation of OCD symptoms.

In summary, anxiety regarding the COVID-19 pandemic extends beyond infected individuals and first responders. Indeed, there is a need to address COVID-19 anxiety in the larger community, as well as to understand whether individuals with mental health diagnoses are suffering. In the current paper, we examine whether individuals with high OCD symptoms, as well as non-anxious individuals, are experiencing increased symptom severity and how this may differ between both groups. The study was designed to test the following hypotheses/aims:

- (1) Examine and compare the frequency, distress, and difficulty dismissing of COVID-19-related intrusive thoughts between high and low OC symptom severity groups
- (2) Compare within high and low OC symptom severity groups the difference between OC and COVID-19-related intrusive thoughts on frequency, distress, and difficulty dismissing.
- (3) Examine whether a higher endorsement of OC symptom severity indicates a higher severity of COVID-19-related intrusive thoughts.
- (4) Examine if the severity of COVID-19 related intrusive thoughts is maintained over time in those who are high and low on OC symptom severity.

2. Method

2.1. Participants and procedure

Sixty-six adults between the ages of 18 and 35 ($M = 20.91$, $SD = 3.92$) completed the current study in late February to mid-April 2020. Participants were recruited from a large state university in the northeast and included both undergraduate and graduate students. Participants were not restricted to individuals enrolled in psychology classes. (see Table 1). Consistent with efforts to not limit participation to

undergraduates, 14 participants were age 22 or above, with nine distributed from age 25 to 35.

Methods of recruitment included fliers, advertisements on a daily online bulletin distributed to students, and advertisements for students who required research credits. Participants either contacted the study coordinator or went through a direct link to access information about the study. Informed consent was obtained from those who wished to participate. Once participants accessed the online surveys through Qualtrics, they filled out a set of questionnaires relating to demographics and OCD-related constructs, as well as measures adapted for use to assess COVID-19 specific reactions. All participants received the same set of surveys, whether they were participating for credit (54%) or other compensation (entries into a lottery prize drawing; 46%). Data was pulled from Qualtrics for analysis in SPSS.

Participants were not given diagnostic interviews. However, to better understand the severity of the sample, participants were given quasi-OCD diagnoses utilizing three items added as a supplement to the Obsessive Compulsive Inventory-Revised (OCI-r; see measures; Foa et al., 1998). Specifically, items assessing time taken up by OCD, interference from OCD symptoms and distress from having these symptoms, were added to correspond with criteria from the *Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013)*. Participants had to endorse that their symptoms took up an hour or more of their time per day, and that their symptoms produced moderate to severe distress or interference to receive a quasi-diagnosis. With this criteria, 9% of the sample would be expected to have clinical OCD.

2.2. Measures

The International Intrusive Thoughts Interview Schedule Version 6 (IITIS; Research Consortium on Intrusive Fear, 2007; Radomsky et al., 2014). To examine the applicability of models of OCD to COVID-19-related anxiety we wanted to assess the experience of intrusions and their impact. The IITIS walks through the process of having intrusive thoughts or images, interpreting them based on underlying beliefs, which then lead to emotional and behavioral responses. For the current study, we assessed COVID-19- and general OC-related intrusive thoughts. Examples of intrusive thoughts included “seeing an image of a close relative in the hospital with the coronavirus” or “having an upsetting intrusive thought that the coronavirus is in NY state.” Specifically, the frequency, related distress, and efforts to dismiss general OC and COVID-19-related intrusive thoughts were assessed using Likert-type scales. Each item on the measure is examined individually rather than holistically. Higher scores indicated greater severity. The IITIS has been used with individuals with and without OCD (Bouvard et al., 2017) from multiple countries (Radomsky et al., 2014).

The Obsessive-Compulsive Inventory-Revised (OCI-R; (Foa et al., 2002)). Developed as a shortened version of the 42-item *Obsessive-Compulsive Inventory (OCI; (Foa et al., 1998))*, the 18-item OCI-R measures an individual’s distress related to OCD symptoms across six OCD subtypes (washing, checking, ordering, obsessing, hoarding, and neutralizing). The OCI-R shows high convergent validity with the OCI ($r = 0.98$) and is a widely utilized measure of OCD-related distress. The OCI-R shares good internal consistency with all six of the OCI subscales for individuals with OCD (all above $r = 0.80$) and four out of the six for non-anxious controls (four above $r = 0.72$). The OCI-R also exhibits good convergent validity with the Y-BOCS (total; $r = 0.53$), the GOCS ($r = 0.66$) and the MOCI ($r = 0.85$). The severity of OCD symptoms was represented by total scores on the OCI-R and using high and low groups based on the recommendations of the original authors (≥ 4.0 on the obsessing subscale, (Foa et al., 2002)). Application of the recommended cut score resulted in 33 participants in each group.

Table 1
Sample demographics.

	%
Gender	
Female	57.6
Male	30.3
Did not identify	12.1
Ethnicity	
Asian or Asian American	25.8
Black or African America	4.5
Hispanic or Latino/a	3.0
White	60.6
Native Hawaiian or Pacific Islander	0
American Indian or Alaska Native	0
More than one ethnicity or Other	6.1
	M(SD)
Age, in years	20.91(3.92)

Note. $N = 66$.

3. Results

3.1. COVID-19- and OC-related intrusive thoughts between groups

Examination of the data showed a wide range of OCD symptom severity. Scores spanned from no symptoms to severe symptoms, with the higher scores consistent with levels reported in treatment-seeking samples. Independent samples t-tests were conducted between the high and low groups on the frequency, distress, and difficulty dismissing OC-related intrusive thoughts and COVID-19-related intrusive thoughts. The high severity group was found to score significantly higher on frequency, distress, and difficulty dismissing OC- and COVID-19 related intrusive thoughts when compared to the low severity group (see Table 2).

3.2. COVID-19- and OC-related intrusive thoughts within groups

Next, utilizing the high and low OCD symptom severity groups, paired-sample t-tests were conducted to examine if COVID-19- and OC-related intrusive thoughts differed within groups on frequency, distress, and difficulty dismissing (see Table 2). The low severity group did not show significant differences between severity of COVID-19- and OC-related intrusive thoughts, indicating that both types of intrusions elicited similar amounts of distress, and were similarly frequent and difficult to dismiss. In the high OCD symptom severity group, COVID-19-related intrusion were significantly different on levels of distress elicited by the two types of intrusions, with COVID-19-related intrusions being associated with higher distress than OC-related intrusive thoughts. Frequency and difficulty dismissing did not differ between types of intrusions.

Table 2
Between and within high and low severity group T-tests.

OC-related intrusions	(df) = t, p	High OCD symptoms M (SD)	Low OCD symptoms M (SD)
• Frequency	(64) = -1.93, ns	2.61 (1.45)	1.97 (1.21)
• Distress	(64) = -3.45, p = .001	2.64 (1.56)	1.58 (0.83)
• Difficulty dismissing	(64) = -3.20, p = .002	2.79 (1.58)	1.70 (1.16)
COVID-19 related intrusions			
• Frequency	(64) = -4.12, p < .001	3.24 (1.77)	1.79 (0.99)
• Distress	(64) = -3.81, p < 0.001	3.36 (1.73)	1.94 (1.22)
• Difficulty dismissing	(64) = -4.21, p < .001	3.15 (1.77)	1.67 (0.92)
High OCD symptoms	(df) = t, p	OC-related intrusions M (SD)	CV-related intrusions M (SD)
• Frequency	(32) = -1.82, ns	2.61 (1.45)	3.24 (1.77)
• Distress	(32) = -1.99, p = .05	2.64 (1.56)	3.36 (1.73)
• Difficulty dismissing	(32) = -9.5, ns	2.79 (1.58)	3.15 (1.78)
Low OCD symptoms			
• Frequency	(32) = -0.76, ns	1.97 (1.21)	1.79 (0.99)
• Distress	(32) = -1.46, ns	1.58 (0.83)	1.94 (1.22)
• Difficulty dismissing	(32) = -0.15, ns	1.70 (1.16)	1.67 (0.92)

Note. N = 66, ns = not significant.

3.3. OCI-R and frequency, distress, and difficulty dismissing of COVID-19-related intrusive thoughts

Further, Pearson correlation coefficients showed that in individuals with heightened OCD symptoms, the severity of these symptoms (OCI-R total) is significantly correlated with increased frequency of intrusive thoughts related to the pandemic, increased distress from them, and more difficulty dismissing the thoughts (r's = 0.46, 0.36 and 0.39 respectively). Finally, a similar pattern of findings was found in individuals with low OCD symptoms. Specifically, both frequency and difficulty dismissing COVID-19 related intrusions were significantly correlated with OCD symptom severity (OCI-R: r's = 0.39 and 0.56 respectively). One difference between the groups is that OCD symptom severity (OCI-R total) was not significantly correlated with increased distress related to COVID-19 intrusions (r = 0.15).

3.4. COVID-19-related intrusive thought severity over time

Finally, a repeated-measures ANOVA was conducted to see if there were differences between the high and low groups on COVID-19-related intrusive thought severity over time. Frequency, distress, and difficulty dismissing were averaged together to create a severity score for COVID-19-related intrusions. The severity score was compared between two time points to see if the two groups maintained severity over time. There was no main effect of time (f(1,43) = 1.39, p = .25), and no interaction between group and time (f(1,43) = 0.15, p = .70). The main effect of group assignment was significant (f(1,43) = 22.18, p < .001), indicating that group determined severity, and COVID-19-related intrusion severity was maintained over time in each of the high and low severity groups.

4. Discussion

Findings from this initial dataset indicate that COVID-19 is eliciting distress in those with OCD, as well as in non-clinical individuals. The two groups considered high and low on the severity of OCD symptoms were significantly different on the severity of COVID-19-related intrusive thoughts, the high group having a greater severity. COVID-19-related intrusions were present in the low OC severity group and were considered mildly distressing. Distress related to intrusive thoughts about COVID-19 was significantly higher than typical OC-related intrusive thoughts for those with a higher OCD severity. Frequency, distress, and difficulty dismissing COVID-19-related intrusive thoughts were all significantly associated with one's OCI-R severity (excluding distress for the low severity group), indicating that the severity of one's OCD symptoms was related to the severity of COVID-19 intrusive thoughts. Also, the severity of COVID-19-related intrusive thoughts was maintained over time in both the high and low OC severity groups. The current findings indicate that individuals with a higher OC severity were more impacted by the presence of COVID-19 intrusive thoughts. Specifically, their COVID-19 intrusive thoughts were significantly more distressing than their typical OC intrusive thoughts. For the entire sample, the higher severity of OC intrusive thoughts, the higher the severity of COVID-19 related intrusive thoughts.

From a cognitive-behavioral perspective, maladaptive beliefs regarding risk and one's ability to cope influence interpretations of physical symptoms, intrusive thoughts, or social interactions, thereby contributing to elevated anxiety. Anxiety occurs when we perceive threat, and individuals with anxiety disorder diagnoses tend to perceive threats as more likely or costly than is objectively the case. However, the same processes would be involved in the case of a real threat. Specifically, substantial distress can also occur from focusing on the aspects of a real threat that one perceives as unchangeable. In addition to cognitive factors, certain behaviors can also exacerbate anxiety. For example, avoidance behaviors may be adaptive to a point, but maladaptive if used too frequently or too broadly. Indeed, finding a healthy balance between

addressing a threat versus suppressing thoughts about it can be difficult. In some cases, the decreases in anxiety from avoidance can tip the balance too far, strengthening beliefs regarding danger and the need to avoid.

Replication of these findings in larger samples is needed. While studies have recently been published on OCD in clinical populations during the pandemic (Chakraborty and Karmakar, 2020; Davide et al., 2020), the presence of intrusive thoughts, or obsessions, in the general population has not been studied to our knowledge at this point. Given the link between COVID-related anxiety and features of OCD found herein, it is reasonable to speculate that interventions that have been developed to address OCD and related disorders may be helpful to individuals experiencing distress from pandemic-related thoughts.

It would be beneficial for future work to encompass a wider range of individuals from diverse backgrounds, as well as a larger sample size. Our study only included students enrolled in undergraduate or graduate studies at a state university with a limited sample size, whereas opening the study to the public may have produced different results. However, young adults have been identified as an at-risk population for mental health issues specifically during this pandemic (Glowacz and Schmits, 2020). Also, due to our sample not concentrating on only clinical individuals, collecting data on symptoms preceding the pandemic was not possible. Improvements in the psychometric properties of the measures may provide more confidence in the findings. We would also like to recognize that after our data had already been collected, the Coronavirus Anxiety Scale was validated and published (Lee, 2020). This measure serves as a brief screener for COVID-19 related anxiety and would have been beneficial. Finally, it will likely be useful to test anxiety levels again as the pandemic continues. However, the findings of the current study and related work are encouraging that we may have tools to alleviate some of the COVID-related distress.

CRedit authorship contribution statement

Cohley P. Acenow: Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Project administration. **Meredith E. Coles:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Visualization, Supervision.

Declaration of Competing Interest

None.

References

- American Red Cross. (2020). *Coping with Sheltering at Home during COVID-19*. <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-0A%09emergencies/coronavirus-safety/coping-with-stress-during-covid-19.html%0A>.
- Banerjee, D., 2020. The other side of COVID-19: impact on obsessive compulsive disorder (OCD) and hoarding. *Psychiatry Res.* 288 (January).
- Barzilay, R., Moore, T.M., Greenberg, D.M., DiDomenico, G.E., Brown, L.A., White, L.K., Gur, R.C., Gur, R.E., 2020. Resilience, COVID-19-related stress, anxiety and depression during the pandemic in a large population enriched for healthcare providers. *Transl. Psychiatry* (1), 10. <https://doi.org/10.1038/s41398-020-00982-4>.
- Bouvard, M., Fournet, N., Denis, A., Sixdenier, A., Clark, D., 2017. Intrusive thoughts in patients with obsessive compulsive disorder and non-clinical participants: a comparison using the International Intrusive Thought Interview Schedule. *Cogn. Behav. Ther.* 46 (4), 287–299. <https://doi.org/10.1080/16506073.2016.1262894>.
- Centers for Disease Control and Prevention. (2020). *Coronavirus Disease 2019 (COVID-19): Stress and Coping*. <https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/managing-stress-anxiety.html>.
- Chakraborty, A., Karmakar, S., 2020. Impact of COVID-19 on obsessive compulsive disorder (OCD). *Iran. J. Psychiatry* 15 (3), 256–259. <https://doi.org/10.18502/ijps.v15i3.3820>.
- Davide, P., Andrea, P., Martina, O., Andrea, E., Davide, D., Mario, A., 2020. The impact of the COVID-19 pandemic on patients with OCD: effects of contamination symptoms and remission state before the quarantine in a preliminary naturalistic study. *Psychiatry Res.* 291 (April), 113213 <https://doi.org/10.1016/j.psychres.2020.113213>.
- Diagnostic and Statistical Manual of Mental Disorders: DSM-5* (Vol. 5). (2013). American Psychiatric Association.
- Foa, E.B., Huppert, J.D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., Salkovskis, P.M., 2002. The Obsessive-Compulsive Inventory: development and validation of a short version. *Psychol. Assess* 14 (4), 485.
- Foa, E.B., Kozak, M.J., Salkovskis, P.M., Coles, M.E., Amir, N., 1998. The validation of a new obsessive-compulsive disorder scale: the Obsessive-Compulsive Inventory. *Psychol. Assess* 10 (3), 206.
- Glowacz, F., Schmits, E., 2020. Psychological distress during the COVID-19 lockdown: the young adults most at risk. *Psychiatry Res.* 293 (May), 113486 <https://doi.org/10.1016/j.psychres.2020.113486>.
- Goodwin, R., Wiwattanapantuwong, J., Tuicomepee, A., Suttiwan, P., Watakakosol, R., 2020. Anxiety and public responses to covid-19: early data from Thailand. *J. Psychiatr. Res.* 129 (June), 118–121. <https://doi.org/10.1016/j.jpsychires.2020.06.026>.
- Ho, C.S., Chee, C.Y., Ho, R.C., 2020. Mental health strategies to combat the psychological impact of COVID-19 beyond paranoia and panic. *Ann. Acad. Med. Singap.* 49 (1), 1–3.
- Husky, M., Kovess-Masfety, V., Swendsen, J.D., 2020. Stress and anxiety among university students in France during Covid-19 mandatory confinement. *Compr. Psychiatry* 102. <https://doi.org/10.1016/j.comppsy.2020.152191>.
- Jassi, A., Shahriyarmolki, K., Taylor, T., Peile, L., Challacombe, F., Clark, B., Veale, D., 2020. OCD and COVID-19: a new frontier. *Cognit. Behav. Ther.* 13 (2020), 1–11. <https://doi.org/10.1017/S1754470X20000318>.
- Khosravani, V., Asmundson, G., Taylor, S., Bastan, F.S., Ardestani, S.M.S., 2021. The Persian COVID stress scales (Persian-CSS) and COVID-19-related stress reactions in patients with obsessive-compulsive and anxiety disorders. *J. Obsessive Compuls. Relat. Disord.* 28.
- Lee, S.A., 2020. Coronavirus Anxiety Scale: a brief mental health screener for COVID-19 related anxiety. *Death Stud.* 44 (7), 393–401. <https://doi.org/10.1080/07481187.2020.1748481>.
- Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., Xu, Y., 2020. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *Gen. Psychiatry* 33 (2), 19–21. <https://doi.org/10.1136/gpsych-2020-100213>.
- Radomsky, A.S., Alcolado, G.M., Abramowitz, J.S., Alonso, P., Belloch, A., Bouvard, M., Clark, D.A., Coles, M.E., Doron, G., Fernández-Álvarez, H., García-Soriano, G., Ghisi, M., Gomez, B., Inozu, M., Moulding, R., Shams, G., Sica, C., Simos, G., Wong, W., 2014. Part 1-You can run but you can't hide: intrusive thoughts on six continents. *J. Obsessive Compuls. Relat. Disord.* 3 (3), 269–279. <https://doi.org/10.1016/j.jocrd.2013.09.002>.
- Research Consortium on Intrusive Fear, 2007. *The International Intrusive Thoughts Interview Schedule, Version 6*. Barcelona, Spain.
- Seçer, İ., Ulaş, S., 2020. An Investigation of the Effect of COVID-19 on OCD in Youth in the Context of Emotional Reactivity, Experiential Avoidance, Depression and Anxiety. *Int. J. Ment. Health Addict.* 1–14.
- Sher, L., 2020. The impact of the COVID-19 pandemic on suicide rates. *QJM* (May), 1–6. <https://doi.org/10.1093/qjmed/hcaa202>.
- Sheu, J.C., Mckay, D., Storch, E.A., 2020. COVID-19 and OCD: Potential impact of exposure and response prevention therapy. 76(January). *J. Anxiety Disord.* <https://doi.org/10.1016/j.janxdis.2020.102314>.
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C.S., Ho, R.C., 2020. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int. J. Environ. Res. Public Health* (5), 17. <https://doi.org/10.3390/ijerph17051729>.
- World Health Organization. (2020). *Mental Health and Psychosocial Considerations During COVID-19 Outbreak*. <https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf>.
- Zhao, H., He, X., Fan, G., Li, L., Huang, Q., Qiu, Q., Kang, Z., Du, T., Han, L., Ding, L., Xu, H., 2020. COVID-19 infection outbreak increases anxiety level of general public in China: involved mechanisms and influencing factors. *J. Affect. Disord.* 276 (February), 446–452. <https://doi.org/10.1016/j.jad.2020.07.085>.