

**Obsessive-compulsive disorder and related symptoms amidst the COVID-19 outbreak:****Results from the COLLATE project**

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Studying obsessive-compulsive disorder (OCD) symptoms amidst the COVID-19 pandemic is important for three major reasons. First, health anxiety can be prevalent in OCD, and exacerbated in the prevailing climate.<sup>1</sup> Second, OCD can develop in response to traumatic events.<sup>2</sup> Third, revised health guidelines have likely normalised certain compulsions (e.g. repeated handwashing). These behaviours may extend to the general population, including fears about becoming ill or infecting others with COVID-19. Few studies have explored OCD amidst previous outbreaks of pandemics. Retrospective analysis of an electronic mental health database concluded that patients with OCD were overrepresented in those expressing moderate to severe swine flu concerns.<sup>3</sup> Another study demonstrated that OCD symptoms significantly predicted swine flu fears in a student cohort.<sup>4</sup> Pertaining to COVID-19, an online survey found higher endorsement of OCD symptoms in medical, relative to non-medical, workers.<sup>5</sup> Having an organic disease was an overall risk factor for OCD symptoms, with being female, rural living and potential COVID-19 exposure as added risk factors for medical workers.

Our current study aimed to: i) document COVID-19 concerns in an OCD group relative to a matched general population (GNP) group, ii) compare their mental health status, including negative emotions, and iii) explore endorsement of OCD-related behaviours and associated predictors. We hypothesised that the OCD group would assign higher rankings for concerns related to becoming ill with COVID-19, and be significantly more depressed, anxious and stressed relative to the GNP. These analyses utilised cross-sectional data from Waves 1 (April) and 2 (May) of our COvid-19 and you: mental health in AusTralia now surVEy (COLLATE) survey. The project design has been published elsewhere<sup>6</sup>. Description of methodology and data analyses, including participant matching (and psychiatric comorbidity in the OCD group in Table A) is summarised in Appendix A.

Table 1 shows the top 10 COVID-19 concerns by group in Wave 1. The top two concerns were identical across groups and related to a ***loved one dying*** or ***being infected with***

**COVID-19.** Notably, *oneself dying* or *being infected with COVID-19* was ranked lower in the OCD group relative to the matched GNP sample. The OCD group did however, place *implications for their personal health and well-being* above that of their *family and loved ones*, with the opposite pattern found for the GNP. Group-wise comparisons of mental health in Wave 1 revealed that the OCD group reported significantly increased depression, anxiety and stress as well as poorer quality of life relative to the GNP, with large effect sizes. *Severe* depression and anxiety, and *moderate* stress were more likely in the OCD group, with *mild* depression more likely in the GNP (Table B, which also characterises groups by sociodemographic information and COVID-19-related lifestyle changes).

[Insert Table 1 here]

When these analyses were rerun for Wave 2, the top 10 themes remained largely similar, with a few exceptions (Table C). However, a trend towards poorer mental health was observed; *extremely severe* depression, anxiety and stress were more likely in the OCD group, whereas *moderate* depression, *mild* anxiety and *moderate* stress were more likely in the GNP (Table D1). Notably, washing, checking and obsession scores did not appear significantly elevated (relative to the original validation study;<sup>7</sup> Table D2). Regression analysis revealed that distal,  $F(5,612)=10.3$ ,  $p<.001$ ,  $r^2=.078$ , and proximal,  $F(14,612)=35.9$ ,  $p<.001$ ,  $r^2=.379$ , factors significantly predicted OCD symptoms across the entire Wave 2 cohort (Table E). Only age, education and having an existing medical condition were significant predictors in Block 1 (distal), but were no longer significant in Block 2 (proximal); these were mediated by depression, anxiety and stress, which served as unique predictors for OCD symptoms.

Our hypothesis was partly supported in that though the OCD group did not assign higher rankings for concerns related to becoming ill from COVID-19, significantly increased negative emotions were reported relative to the GNP. When coupled with the finding that

negative emotions were significantly associated with OCD symptoms, this suggests the mental health of persons with OCD may be more adversely affected in the longer run. Study limitations included relying on self-reported OCD, and the inability to perform statistical comparisons between our two data waves (owing to unequal group sizes and few repeat respondents). Previous pandemic research has suggested delayed and prolonged mental health impacts, with time lags from pandemic onset to manifestation of psychopathology.<sup>8</sup> Applying this reasoning, we infer that if effective interventions to address elevated negative emotions are not enacted in a timely manner, OCD symptoms may significantly worsen as the outbreak continues to unfold. This is the challenge that existing mental healthcare systems need to address.

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**Supporting information legend**

Appendix A: Methods

Appendix B: Sociodemographic information and mental health status by group

Appendix C: Top 10 ranked COVID-19 concerns by group

Appendix D: Negative emotions and obsessive-compulsive symptoms

Appendix E: Regression analyses predicting OCD symptoms

## **Appendix A: Methods**

### ***Participants and procedures***

The COVID-19 and you: mental health in Australia now survey (COLLATE) project was launched on 1 April 2020, as a nationwide mental health survey aimed at identifying and tracking key mental health concerns across the Australian population amidst the unfolding COVID-19 pandemic. In brief, this comprises a series of 12 anonymous, online surveys, activated for 72 hours at the start of each month, followed by four annual surveys thereafter. Members of the general public residing in Australia, aged 18 years or older were invited to complete the survey via social media advertising and other online networks, participant registries held by Swinburne University of Technology as well as non-discriminative snowball sampling stemming from these initial recruitment methods. Past respondents were encouraged to participate in each new round of surveys, but new respondents who had not previously taken part were also accepted. Such a study design facilitates longitudinal tracking (where sufficient repeat respondents are achieved), but also permits timely snapshots across multiple points to gain a broad understanding of population mental health as the COVID-19 situation evolves. The study received ethics approval from the Swinburne University Human Research Ethics Committee (#20202917-4107), and complied with the Declaration of Helsinki. Respondents provided informed consent, and collected responses were anonymous.

### ***Materials and measures***

Three broad areas were examined: i) sociodemographic information, ii) primary COVID-19-related concerns, and iii) mental health status. The current study presented data related to Waves 1 (April 2020) and 2 (May 2020) of the project. Only measures addressing current aims are described. Across both waves of the survey, basic sociodemographic

information was collected, including age, sex, education, employment, existing medical conditions, and COVID-19-related lifestyle changes in eating, exercise, sleep and alcohol use. Respondents were asked to indicate whether they were “A person with lived experience of a mental illness”, and if so, to specify their mental health condition(s). Those who endorsed this option and specified OCD were assigned to the OCD group (see Table A for a breakdown of psychiatric comorbidities for this group), and those who did not elect this option (i.e. no self-reported psychiatric conditions) were designated as the GNP.

Table A

*Breakdown of psychiatric comorbidities for the OCD group (n=66; Wave 1)*

<b>Comorbid psychiatric disorders</b>	<b>n</b>	<b>%</b>
Bipolar disorder	1	1.5
Bipolar disorder, eating disorder	1	1.5
Depression only	1	1.5
Depression, eating disorder	1	1.5
Eating disorder only	1	1.5
Generalised anxiety only	10	15.2
Generalised anxiety, depression	16	24.2
Generalised anxiety, depression, agoraphobia	1	1.5
Generalised anxiety, depression, borderline personality disorder	1	1.5
Generalised anxiety, depression, eating disorder	6	9.1
Generalised anxiety, depression, eating disorder, schizophrenia	1	1.5
Generalised anxiety, depression, eating disorder, trichotillomania	1	1.5
Generalised anxiety, depression, hoarding	1	1.5
Generalised anxiety, depression, post-traumatic stress disorder	4	6.1
Generalised anxiety, depression, social anxiety	2	3.0
Generalised anxiety, eating disorder	2	3.0
Generalised anxiety, eating disorder, post-traumatic stress disorder	1	1.5
Generalised anxiety, schizophrenia	1	1.5
Post-traumatic stress disorder only	1	1.5
Social anxiety, depression	1	1.5
None (OCD only)	12	18.2

*Note.* All psychiatric disorders were disclosed via self-report. OCD=Obsessive-compulsive disorder.

Respondents were also asked to identify their top 10 concerns relating to the COVID-19 outbreak, based on a list of 23 pre-generated options (see Table 1 in letter). Mental health status was assessed using a range of measures/questions. The Depression Anxiety Stress Scales (DASS-21)<sup>9</sup> is a 21-item self-report measure with three subscales (nb. DASS-21 scores should be multiplied by two for descriptive interpretation of severity ratings, where **depression**: *normal* 0-9, *mild* 10-13, *moderate* 14-20, *severe* 21-27, *extremely severe* >28; **anxiety**: *normal* 0-7, *mild* 8-9, *moderate* 10-14, *severe* 15-19, *extremely severe* >20; and **stress**: *normal* 0-14, *mild* 15-18, *moderate* 19-25, *severe* 26-33, *extremely severe* >34). The European Health Interview Surveys-Quality of Life (EUROHIS-QoL)<sup>10</sup> was used to measure quality of life across eight principal domains. Unusual thinking styles were assessed with three questions: 'I often feel that others have it in for me', 'No one really cares much what happens to me' and 'It is safer to trust no one', rated on 5-point Likert scales. At Wave 2, three subscales (i.e. checking, washing, obsessing) of the Obsessive-Compulsive Inventory-Revised (OCI-R)<sup>7</sup> were inserted to facilitate further inquiry into OCD symptoms as the COVID-19 outbreak progressed.

### **Statistical analyses**

Statistical analyses were conducted using SPSS, version 26. Cross-sectional data at Waves 1 and 2 were used to address our primary aims of identifying COVID-19-related concerns and assessing the mental health status of those with OCD. In Wave 1, each respondent with OCD was randomly matched on age, sex, and state of residence with three corresponding persons from the GNP (nb. a matching ratio of 1 OCD:3 GNP respondents was chosen, as this was the minimum number of matches yielded across all respondents with OCD). This allowed us to control for the extraneous influence of these demographic factors on our variables of interest. No matching was conducted in Wave 2 due to the relatively modest

number of respondents with OCD. Chi-squared tests for independence were performed for categorical variables, with adjusted residuals ( $AdjR$ ) $\geq 2.5$  signifying important associations. Analyses of variance (ANOVAs) were carried out for continuous variables, with Welch's ratio reported for violations of homoscedasticity; Mann-Whitney  $U$  tests were utilised for non-normal variables. An alpha of .05 was set for statistical significance, and Bonferroni adjustments were applied where appropriate (i.e. DASS-21 and EUROHIS-QoL subscales).

Cross-sectional data at Wave 2 was also employed to explore our third aim involving endorsement levels and predictors of OCD-related behaviours. Mean scores for DASS-21 subscales were contrasted with Wave 1 data (nb. there were insufficient repeat respondents with OCD across the two waves to conduct longitudinal analyses;  $n=11$ ); and mean scores for OCI-R subscales were compared to respective cohort norms from the original validation study.<sup>7</sup> The latter comparison was performed to contextualise OCD symptoms in the Wave 2 OCD and GNP groups (in the absence of baseline OCD data). Regression analysis was employed to identify significant predictors of OCD symptoms across the Wave 2 cohort. This analysis was performed across the entire cohort to gain a continuum understanding of OCD symptoms during the COVID-19 outbreak (irrespective of diagnosis). A composite OCD symptom score (based on summation of our select OCI-R subscales) was designated as the dependent variable, with possible predictors assigned as distal (i.e. pre-existing variables typically associated with sociodemographics) or proximal (i.e. precipitating variables typically linked to COVID-19) factors. Distal predictors (age, sex, education, employment, existing medical condition) were entered as Block 1; and proximal predictors (eating, exercise and sleep behaviours, alcohol use, depression, anxiety, stress, quality of life) were entered as Block 2. The number of predictors was within recommended guidelines for minimum sample size requirements, and residual assumptions of normality and homoscedasticity were supported (i.e. no transformation was required for the OCI-R).

## Appendix B: Sociodemographic information and mental health status by group

### Wave 1

Of the respondents ( $N=5,158$ ) who completed Wave 1, a subset was selected for our analyses. These comprised individuals with self-reported OCD ( $n=66$ ) randomly matched on age, sex and state of residence with those from the GNP ( $n=198$ ) with no mental disorders. In our sample, respondents were aged  $32.9\pm 10.3$  years, 10.6% male, and residing in various Australian states and territories (i.e. Australian Capital Territory=1.5%, New South Wales=12.1%, Queensland=7.6%, South Australia=1.5%, Tasmania=4.5%, Victoria=69.7%, Western Australia=3.0%).

Table B shows sociodemographic information and COVID-19-related lifestyle changes by group. Relative to the matched GNP sample, the OCD group was significantly less well-educated ( $AdjR=2.6$ ), with a lower employment rate ( $AdjR=2.6$ ), and higher prevalence of existing medical conditions ( $AdjR=5.7$ ). There were no significant group differences regarding perceived impact of COVID-19 government restrictions. In terms of lifestyle changes, a significantly higher proportion of the OCD group endorsed more food restriction ( $AdjR=2.7$ ), more binge eating ( $AdjR=2.5$ ) and reduced sleep ( $AdjR=3.0$ ) than the matched GNP sample. These latter findings could possibly be explained by comorbid psychiatric conditions in the OCD group, with almost a quarter (22.6%) reporting co-occurring bipolar and/or eating disorders (see Table A). A significantly higher fraction of the OCD group also reported currently working from home ( $AdjR=2.5$ ). No significant group differences were observed in exercise behaviours or alcohol use.

Based on descriptive interpretation of severity ratings for the DASS-21, the highest proportion of the OCD group was classed in the *extremely severe* category across all emotional states. When specific life domains were assessed, the OCD group reported significantly lower

satisfaction with their life (in general), health, activities of daily living and self; no significant group differences were observed for other areas. For unusual thinking styles, the OCD group reported feeling significantly more persecuted, uncared for, and less trusting of others compared to the matched GNP sample, with small to medium effect sizes.

Table B

*Sociodemographic information and mental health status by group (Wave 1)*

	Means $\pm$ standard deviations, medians, or percentages		Statistics		
	OCD ( <i>n</i> =61-66)	GNP ( <i>n</i> =191-198)	<i>F</i> , $\chi^2$ , <i>U</i>	<i>p</i>	$\eta^2$ , <i>V</i> , <i>r</i>
<b>Sociodemographics</b>					
Education (% tertiary)	62.1	78.3	6.8	<b>.009</b>	.160
Employment (% employed)	50.0	67.7	6.5	<b>.011</b>	.158
Existing medical condition (% yes)	60.9	22.7	32.4	<b>&lt;.001</b>	.352
Impact of government restrictions (% positive, neutral, negative)	23.1, 9.2, 67.7	22.2, 18.2, 59.6	3.0	.224	.107
<b>Lifestyle changes (% more, no change, less)</b>					
Food restriction	45.3, 43.8, 10.9	27.3, 62.1, 10.6	7.8	<b>.020</b>	.173
Food bingeing	48.4, 43.8, 7.8	31.3, 81.6, 6.1	7.2	<b>.027</b>	.166
Exercise behaviours	34.4, 21.9, 43.8	43.9, 19.2, 36.9	1.8	.400	.084
Sleep patterns	40.6, 9.4, 50.0	32.8, 27.3, 39.9	8.8	<b>.012</b>	.183
Alcohol use	37.1, 51.6, 11.3	32.1, 56.0, 11.9	0.5	.769	.045
Working from home (% yes)	53.8	36.4	6.2	<b>.013</b>	.154
<b>Mental health</b>					
Depression (DASS-21)	10.5 $\pm$ 6.0	5.0 $\pm$ 4.1	46.1	<b>&lt;.001</b>	.206
Anxiety (DASS-21)	8.3 $\pm$ 5.4	2.9 $\pm$ 2.7	57.0	<b>&lt;.001</b>	.298
Stress (DASS-21)	12.1 $\pm$ 5.0	6.7 $\pm$ 3.9	61.4	<b>&lt;.001</b>	.236
<b>Quality of life (EUROHIS-QoL)</b>					
Life (in general)	3.0	4.0	12.2	<b>&lt;.001</b>	.019
Health	2.0	4.0	9.0	<b>.003</b>	.021
Energy levels	3.0	4.0	6.6	.010	.023

Activities of daily living	3.0	4.0	7.8	<b>.005</b>	.022
Self-satisfaction	2.0	4.0	18.1	<b>&lt;.001</b>	.023
Personal relationships	4.0	4.0	1.9	.171	.011
Finances	4.0	4.0	1.8	.176	.007
Conditions of living	4.0	4.0	0.3	.552	.008
<b>Unusual thinking styles</b>					
Feeling persecuted	2.0	1.0	16.0	<b>&lt;.001</b>	.017
Feeling uncared for	2.0	1.0	11.3	<b>.001</b>	.012
Not trusting others	2.0	1.0	15.9	<b>&lt;.001</b>	.017

*Note.* Wave 1 of the COLLATE study was launched on 1 April 2020, shortly after Stage 3 COVID-19 restrictions were enforced, where residents were legally mandated to stay at home, except to shop for food and other essential supplies, for medical care and caregiving, to exercise, or for work or education (if unable to do so remotely). OCD=Obsessive-compulsive disorder; GNP=General population; DASS-21=Depression Anxiety Stress Scales (three 7-item subscales assessing negative emotions, rated on 4-point Likert scales (0-3), with higher scores indicating greater psychopathology); EUROHIS-QoL=European Health Interview Surveys - Quality of Life (8-item measure assessing quality of life, rated on five-point Likert scales (1-5), with higher scores indicating greater levels of satisfaction); Unusual thinking styles (three questions rated on 5-point Likert scales (1-5), with higher scores indicating greater psychopathology). Statistics refer to chi-squared tests for independence (Cramer's V: .06=small, .17=medium, .29=large) for Sociodemographics and Lifestyle changes, one-way analyses of variance (ANOVAs;  $\eta^2$ : .01=small, .06=medium, .14=large) for Anxiety, Depression, Stress and Quality of life, and Mann-Whitney *U* tests for EUROHIS-QoL items and Unusual thinking styles (*r*: .1=small, .3=medium, .5=large). Significance was set at  $p < .05$  or Bonferroni adjusted where appropriate (DASS=.05/3=.017, EUROHIS-QoL=.05/8=.006).

### Appendix C: Top 10 ranked COVID-19 concerns by group

Of the respondents who completed Wave 2 ( $N=618$ ), a subset comprising the two groups of interest (OCD  $n=21$ ; GNP  $n=478$ ) were employed in the first part of the analyses (i.e.  $n=119$  respondents with a self-reported psychiatric diagnosis other than OCD were excluded). When the top concerns analysis was rerun for Wave 2, rankings of top COVID-19 concerns by group were not substantially different from those previously endorsed (see Table C). Oneself being infected was ranked the same as the GNP, but oneself dying from COVID-19 was notably ranked higher by the OCD group in Wave 2. This could signify greater mortality fears related to COVID-19 as the outbreak progressed, but small OCD numbers in Wave 2 necessitate caution in drawing firm conclusions. There were however, two exceptions for the OCD group in Wave 2; concerns pertaining to ***domestic violence*** and ***adapting to working from home*** were now prioritised within the top concerns (with ***unemployment or reduced employment, social isolation and social distancing***, and ***not being able to attend their regular place of worship*** less important).

Three possible reasons could explain our patterns of findings from the two waves of data. First, our pre-generated list of COVID-19-related concerns was not specific to OCD pathology. Second, the COVID-19 outbreak has been relatively well-managed in Australia, with low case numbers and limited community transmission from the outset. Third, more than half of our OCD cohort reported working from home during this time. These external circumstances could have helped temper their health anxieties. Possibly owing to their vulnerable mental state, the OCD group also prioritised the health and wellbeing of self over that of family and loved ones, but endorsed fewer economic concerns (i.e. risk of unemployment, personal finances).

Table C

*Top 10 ranked COVID-19-related concerns by group (Wave 2)*

	OCD ( <i>n</i> =21)				GNP ( <i>n</i> =478)			
	Mean rank	Mean rating ± StdDev	<i>n</i>	%	Mean rank	Mean rating ± StdDev	<i>n</i>	%
Balancing work and caring for children or dependents	1	1.00±0	1	4.8	2	3.77±2.78	98	20.5
Dying of COVID-19 myself	2	2.50±1.72	10	47.6	5	4.80±2.98	173	36.2
Other	2	2.50±2.12	2	9.5	12	5.77±3.65	60	12.6
Loved one dying from COVID-19	4	3.06±2.86	16	76.2	1	3.29±2.81	333	69.7
Implications for health and well-being of self	5	4.19±2.32	16	76.2	7	5.26±2.54	340	70.1
Loved one being infected with COVID-19	6	4.40±2.47	15	71.4	3	3.88±2.63	336	70.3
Implications for health and well-being of family and loved ones	7	4.44±2.31	18	85.7	4	4.23±2.29	422	88.3
Domestic violence	8	5.00±2.00	7	33.3	16	6.61±2.64	87	18.2
Adapting to working from home	8	5.00±2.83	2	9.5	17	6.66±2.65	82	17.2
Oneself being infected with COVID-19	8	5.00±3.57	12	57.1	8	4.80±2.98	173	36.2
Implications for health and well-being of society	11	5.53±2.94	17	81.0	9	5.55±2.52	357	74.7
Risk of unemployment or reduced employment	12	6.00±3.46	10	47.6	6	5.17±2.92	220	46.0
Travel restrictions	13	6.17±1.72	6	28.6	15	6.31±2.60	248	51.9
The Australian economy	14	6.19±2.48	16	76.2	13	6.16±2.54	342	71.5
The world economy	15	7.11±1.54	9	42.6	18	6.74±2.52	234	49.0
Availability of food and medicines	16	7.22±2.22	9	42.6	22	7.52±2.27	133	27.8
Social isolation and social distancing	17	7.31±2.06	13	61.9	10	5.66±2.76	322	67.4
Access to appropriate medical care	18	7.45±2.38	11	52.4	19	6.75±2.33	137	28.7
Media coverage of the pandemic	19	7.60±1.67	5	23.8	23	7.59±2.38	128	26.8
Not being able to attend regular place of worship	20	7.67±3.22	3	14.3	11	5.70±2.91	27	5.6
Personal finances	21	8.00±1.41	5	23.8	14	6.28±2.76	184	38.5
Government communication of key messages	22	8.33±2.08	3	14.3	21	7.21±2.20	109	22.8

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The rapidly changing landscape	23	8.75±1.50	4	19.0	20	7.02±2.40	154	32.2
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*Note.* For current concerns relating to COVID-19, rankings from 1 (greatest concern) to 10 (least concern) were computed (0 was assigned to options that were not endorsed). StdDev=standard deviation; OCD=Obsessive-compulsive disorder; GNP=General population.

**Appendix D: Negative emotions and obsessive-compulsive symptoms**

Table D1 displays means and descriptive interpretation of severity ratings for DASS-21 subscales by group across time. Comparing descriptive interpretation of severity ratings across the two waves suggested substantial differences with time; the Wave 2 OCD group reported *extremely severe* depression, anxiety and stress, and Wave 2 GNP reported *moderate* depression and stress as well as *mild* anxiety. Despite overall higher means across all emotional states in Wave 2, respondents with OCD were more evenly spread across the descriptive categories (away from *extremely severe* in Wave 1), possibly signifying some degree of adaptive coping. Yet these findings are of concern as they denote suboptimal mental health in the OCD cohort.

Table D1

Means and descriptive interpretation of severity ratings for DASS-21 subscales by group across time (Waves 1 and 2)

	Wave 1						Wave 2					
	Depression		Anxiety		Stress		Depression		Anxiety		Stress	
	OCD (n=63)	GNP (n=197)	OCD (n=62)	GNP (n=198)	OCD (n=62)	GNP (n=198)	OCD (n=12)	GNP (n=438)	OCD (n=17)	GNP (n=472)	OCD (n=13)	GNP (n=425)
<b>Mean ± StdDev (DASS-21 multiplied by two)</b>	21.0±11.9	10.0±8.2	16.6±10.8	5.8±5.4	24.2±9.9	13.4±7.7	37.9±23.8	17.1±15.8	23.6±20.7	8.7±10.6	37.8±22.6	23.0±15.1
<b>Respondents (%)</b>												
<b>Normal</b>	12.7	46.7	21.0	65.2	4.8	21.2	33.3	58.2	52.9	80.1	30.8	34.4
<b>Mild</b>	6.3	7.6	3.2	9.6	1.6	8.6	0	9.6	11.8	5.5	7.7	12.0
<b>Moderate</b>	17.5	21.8	25.8	18.2	12.9	30.8	25.0	17.4	17.6	6.6	23.1	21.4
<b>Severe</b>	11.1	8.6	12.9	3.5	11.3	19.7	25.0	9.1	0	6.1	7.7	19.3
<b>Extremely severe</b>	52.4	15.2	37.1	3.5	69.4	19.7	16.7	5.7	17.6	1.7	30.8	12.9

Note. StdDev=standard deviation; OCD=Obsessive-compulsive disorder; GNP=General population; DASS-21=Depression Anxiety Stress Scales (three 7-item subscales assessing negative emotions, rated on 4-point Likert scales (0-3), with higher scores indicating greater psychopathology). DASS-21 scores were multiplied by two for descriptive interpretation of severity ratings, where **depression**: normal 0-9, mild 10-13, moderate 14-20, severe 21-27, extremely severe >28; **anxiety**: normal 0-7, mild 8-9, moderate 10-14, severe 15-19, extremely severe >20; and **stress**: normal 0-14, mild 15-18, moderate 19-25, severe 26-33, extremely severe >34.

Table D2 displays current (i.e. past four weeks) OCI-R subscales by group, alongside means and standard deviations derived from the original validation study.<sup>7</sup> As can be seen, values were mostly aligned with those from the validation study, especially on the washing subscale, with the checking and obsession subscales rated slightly lower (but still less than one standard deviation discrepant). No statistical group-wise comparisons were conducted for this portion of the analyses owing to highly uneven group sizes. Evidently, the OCD and GNP groups demonstrated similar symptom ratings relative to their respective cohort norms across the categories of washing, checking and obsessions, even in the face of the COVID-19 outbreak. This could again be partly attributed to a relatively well-managed medical crisis and high fraction of the Wave 2 OCD cohort (52.4%) also working from home. Indeed, being in a ‘safe’ home environment in the current climate could somewhat alleviate OCD symptoms.

Table D2

Means and standard deviations for OCI-R subscales by group (Wave 2)

	Mean ± standard deviation			
	Current study		Foa et al. (2002)	
	OCD (n=21)	GNP (n=467-471)	OCD (n=215)	GNP (n=477)
<b>OCI-R subscales</b>				
Washing	4.5±3.7	2.4±2.4	4.4±4.3	2.4±2.5
Checking	3.4±3.4	1.2±1.7	4.8±3.9	2.9±2.6
Obsessions	6.9±3.8	1.9±2.5	7.2±3.8	2.9±2.7

*Note.* Wave 2 of the COLLATE study was launched on 1 May 2020, where Stage 3 restrictions had been enforced for approximately four weeks. OCD=Obsessive-compulsive disorder; GNP=General population; OCI-R=Obsessive-Compulsive Inventory-Revised (selected three 3-item subscales assessing OCD symptom dimensions, rated on 5-point Likert scales (0-4), with higher scores indicating higher psychopathology).

### Appendix E: Regression analysis predicting OCD symptoms

Exploratory regression analysis uncovered depression, anxiety and stress as the only significant predictors of OCD symptoms (after controlling for distal factors) across the Wave 2 sample. On the whole, our model accounted for 45.7% of the variance in OCD symptoms.

Table E1

*Distal and proximal predictors of OCD symptoms (Wave 2)*

	Standardised coefficient $\beta$	95% confidence interval	<i>p</i>	Part correlations
<b><i>Block 1 (distal predictors only)</i></b>				
Age	-.220	-.130 to -.060	<.001	-.208
Sex	.056	-.292 to 1.89	.151	.056
Education	-.106	-.916 to -.138	.008	-.104
Employment	-.070	-.108 to .066	.083	-.068
Existing medical condition	.125	.553 to 2.41	.002	.122
<b><i>Block 2 (distal and proximal predictors)</i></b>				
Age	-.049	-.049 to .007	.149	-.044
Sex	-.009	-.992 to .724	.759	-.009
Education	-.002	-.324 to .299	.938	-.002
Employment	.039	-.177 to .737	.229	.036
Existing medical condition	.023	-.484 to 1.03	.480	.021
Food restriction	-.050	-.734 to .071	.106	-.049
Food bingeing	-.034	-.729 to .222	.296	-.032
Exercise behaviours	-.056	-.559 to .022	.070	-.055
Sleep patterns	.034	-.144 to .503	.275	.033
Alcohol use	.008	-.328 to .423	.805	.007
Depression	.172	.044 to .163	.001	.103
Anxiety	.321	.195 to .344	<.001	.214
Stress	.189	.063 to .194	<.001	.116
Quality of life	-.071	-.148 to .014	.104	-.049

*Note.* A three-subscale composite OCD symptom score was designated as the dependent variable, with distal predictors (age, sex, education, employment, existing medical condition) entered as Block 1, and proximal predictors (eating, exercise and sleep behaviours, alcohol use, depression, anxiety, stress, quality of life) entered as Block 2.