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Supporting information

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Table S1. Supporting Information.

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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.[1] Second, OCD can develop in response to traumatic events.[2] Third, revised health guidelines have likely normalized certain compulsions (e.g., repeated handwashing). These behaviors 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.[3] Another study demonstrated that OCD symptoms significantly predicted swine flu fears in a student cohort.[4] Pertaining to COVID-19, an online survey found higher endorsement of OCD symptoms in medical, relative to non-medical, workers.[5] 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 group members' mental health status, including negative emotions; and (iii) explore endorsement of OCD-related behaviors and associated predictors. We hypothesized 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 group. These analyses utilized cross-sectional data from Waves 1 (April) and 2 (May) of our COVID-19 and You: Mental Health in Australia Now Survey (COLLATE). The project design has been published elsewhere.[6] A description of methodology and data analyses, including participant matching (and psychiatric comorbidity in the OCD group in Table A), is summarized 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 health and well-being of self' above that of their 'family and loved ones,' with the opposite pattern found for the GNP group. 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 group, 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 group (see Appendix B and Table B, which also characterizes groups by sociodemographic information and COVID-19-related lifestyle changes).

When these analyses were rerun for Wave 2, the top 10 themes remained largely similar, with a few exceptions (Appendix C and 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 group (Appendix D and Table D1). Notably, washing, checking, and obsession scores did not appear significantly elevated (relative to the original validation study[7]; Table D2). Regression analysis revealed that distal, $F(5, 612) = 10.3$, $P < 0.001$, $r^2 = 0.078$, and proximal, $F(14, 612) = 35.9$, $P < 0.001$, $r^2 = 0.379$, factors significantly predicted OCD symptoms across the entire Wave 2 cohort (Appendix E and 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 group. When coupled with the finding that negative emotions were significantly associated with OCD symptoms, this suggests that 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.[8] 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 health-care systems need to address.

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Table 1. Top 10 ranked COVID-19-related concerns by group (Wave 1)

	OCD group (n = 66)				GNP group (n = 198)			
	Mean rank	Mean rating ± SD	n	%	Mean rank	Mean rating ± SD	n	%
Loved one dying from COVID-19	1	2.35 ± 2.51	52	78.8	1	2.59 ± 2.44	162	81.8
Loved one being infected with COVID-19	2	3.96 ± 2.45	51	77.3	2	3.56 ± 2.36	152	76.8
Not being able to attend regular place of worship	3	4.00 ± 2.94	4	6.1	23	7.64 ± 2.58	11	5.6
Dying of COVID-19 myself	4	4.41 ± 2.79	37	56.1	3	4.67 ± 2.80	78	39.4
Implications for health and well-being of self	5	4.54 ± 2.24	48	72.7	8	5.45 ± 2.57	119	60.1
Other	6	4.75 ± 3.28	8	12.1	9	5.69 ± 2.96	16	8.1
Implications for health and well-being of family and loved ones	7	4.83 ± 2.04	52	78.8	4	4.68 ± 2.31	164	82.8
Risk of unemployment or reduced employment	8	4.87 ± 2.68	30	45.5	5	4.72 ± 2.67	122	61.6
Social isolation and social distancing	9	4.90 ± 2.64	31	47.0	11	6.04 ± 2.58	130	65.7
Oneself being infected with COVID-19	10	5.44 ± 2.39	39	59.1	6	5.13 ± 2.75	118	59.6
Balancing work and caring for children or dependents	10	5.44 ± 3.28	9	13.6	7	5.30 ± 2.90	47	23.7
Implications for health and well-being of society	12	5.96 ± 2.56	46	69.7	12	6.31 ± 2.70	131	66.2
Media coverage of the pandemic	13	6.50 ± 2.78	12	18.2	19	7.00 ± 2.67	33	16.7
Domestic violence	14	6.54 ± 2.07	13	19.7	20	7.04 ± 2.24	26	13.1
Access to appropriate medical care	15	6.59 ± 2.58	37	56.1	17	6.80 ± 2.39	85	42.9
Availability of food and medicines	16	6.95 ± 2.37	39	59.1	18	6.88 ± 2.16	95	48.0
The rapidly changing landscape	17	6.96 ± 2.43	26	39.4	13	6.53 ± 2.52	68	34.3
Government communication of key messages	18	7.05 ± 2.92	19	28.8	16	6.79 ± 1.77	34	17.2
Adapting to working from home	19	7.18 ± 2.18	11	16.7	21	7.46 ± 2.59	54	27.3
The Australian economy	20	7.20 ± 2.47	35	53.0	14	6.55 ± 2.59	105	53.0
Personal finances	21	7.29 ± 2.77	28	42.4	10	5.84 ± 3.03	95	48.0
The world economy	22	7.74 ± 2.51	19	28.8	22	7.57 ± 2.36	74	37.4
Travel restrictions	23	8.00 ± 2.11	14	21.2	15	6.64 ± 2.38	61	30.8

For current concerns relating to COVID-19, rankings from 1 (greatest concern) to 5 (least concern) were computed (0 was assigned to options that were not endorsed).
GNP, general population; OCD, obsessive–compulsive disorder.

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Disclosure statement

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Supporting information

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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.

PCN Psychiatry and Clinical Neurosciences

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Association between living with others and depressive symptoms in Japanese hospital workers during the COVID-19 pandemic

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This Letter presents the findings of a cross-sectional study on the association between living with others and depressive symptoms among 1228 workers, aged 21–73 years, from a large hospital and its affiliated institute in Tokyo, 66.8% of whom had engaged in some sort of COVID-19-related work. The Introduction, Methods, Results, Discussion, and Tables are presented as an online supplement (Appendix S1).

The COVID-19 pandemic is having a particularly significant psychological impact on health-care workers, with 25% reported to be depressed during the pandemic.[1] Health-care workers are not only at higher risk of exposure to SARS-CoV-2 and increased workloads,[2] but also social isolation and rejection due to the high probability that they will come into contact with potentially infectious COVID-19 patients.[3]

Social support has been recognized as a protective factor for mental health among health-care workers during the COVID-19 pandemic.[4] However, social restrictions lead to reduced access to support from family and friends, and degrade social support systems, which can cause loneliness and depressed mood.[5] In particular, individuals who live alone may be at high risk of adverse psychological conditions when they miss out on opportunities for emotional exchange and social support with cohabitants. These findings indicate the need to explore the relation between living alone and depressive symptoms during pandemic-related restrictions.

While accumulating evidence suggests that living alone exacerbates depressive symptoms,[6] research on this issue among health-care workers during the COVID-19 pandemic is scarce. To our knowledge, only one recent study in China has investigated the relation between living alone and depression symptoms in medical staff during the COVID-19 pandemic.[7]

The aim of this study was to examine the cross-sectional association of living with others with depressive symptoms among staff members at the National Center for Global Health and Medicine (NCGM) in Tokyo, Japan, a leading institute in the response to COVID-19 in Japan.

Data for the present study were derived from the NCGM Clinical Epidemiology Study on SARS-CoV-2 Antibody, an ongoing clinical epidemiological study conducted among workers at NCGM. The first wave of the survey, conducted in July 2020, mainly targeted those who had engaged in COVID-19-related work or had worked in a department with high risk of SARS-CoV-2 infection. Of 1579 eligible participants, 1228 employees participated in the survey. Depressive symptoms were assessed using a two-question case-finding instrument for depression.[8] Living status was categorized into living 'alone,' 'with one person,' 'with two people,' 'with three people,' or 'with four people or more.' To examine the cross-sectional association between living with others and depressive symptoms, we performed multiple logistic regression analysis and calculated the odds ratios (OR) and 95% confidence intervals of depressive symptoms for living with others, using those who lived alone as the reference group. Variables adjusted in the multivariate model were age, sex, occupation, working hours, degree of possible exposure to SARS-CoV-2, leisure-time physical activity, smoking status, alcohol consumption, sleep duration, body mass index, comorbidity of chronic disorders, and dietary factors. Details of variables used in this analysis are described in Appendix S2.

Of 1228 participants, 268 participants (21.8%) were identified as having depressive symptoms. The OR of depressive symptoms tended to decrease with increasing number of cohabitants. To our knowledge, this is one of only a few studies to have investigated the association between living with others and depressive symptoms in hospital workers during the COVID-19 pandemic.

Our findings agree with those of a meta-analysis of observational studies among the elderly, which indicated that older people living alone have a higher risk of depression than those living with others.[6] In a cross-sectional study conducted in China during the COVID-19 pandemic, medical staff living alone reported significantly higher depressive symptoms than those living with others.[7] We confirmed that living with others is associated with the mental health of hospital workers during the COVID-19 pandemic, even after adjustment for sleep and mood-related dietary factors. The present study is limited due to its cross-sectional design and lack of detailed information on family members/cohabitants. Further studies are required to address these issues.

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Disclosure statement

The authors declare no conflicts of interest.

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