Psychological Impact of COVID-19 on Occupational Therapists: An Online Survey in Japan

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Importance: Coronavirus disease 2019 (COVID-19) has had a severe psychological impact on frontline and second-line medical workers. However, few empirical reports have been published on its impact on occupational therapists. Clarifying the mental health status of occupational therapists is important to maintain care quality and prevent psychological problems in this population.

Objective: To investigate the psychological impact of COVID-19 on Japanese occupational therapists in prefectures with and without severe pandemic-related restrictions and elucidate factors associated with psychological problems such as anxiety, depression, and insomnia.

Design: A cross-sectional online survey using region-stratified two-stage cluster sampling conducted May 28–31, 2020.

Participants: The sample included 371 participants (63.1% women) in the prefectures under specific cautions (i.e., where residents were strictly advised to refrain from outings) and 1,312 in the prefectures without such cautions (61.9% women).

Results: The increase in workload due to the pandemic was significantly related to an increase in anxiety, depression, and insomnia, and an attempt to avoid talking face to face with others was significantly related to an increase in anxiety regardless of area. In prefectures under specific cautions as of May 25, 2020, the provision of sufficient information on COVID-19 by the workplace significantly reduced the risk of insomnia. In other prefectures, the provision of sufficient information significantly reduced the risk of depression.

Conclusions and Relevance: These results demonstrate the severe negative psychological impact of the increase in workload resulting from COVID-19 and suggest the importance of psychological support for occupational therapists, such as the provision of sufficient information by the workplace.

What This Article Adds: This study highlights the importance of providing psychological support for occupational therapists worldwide.

The coronavirus disease 2019 (COVID-19) pandemic has had an unprecedented impact on human lives. This pandemic can be viewed as a global stressor induced by widespread voluntary restraint and social isolation or social distancing and, as previous studies have suggested, it increases the potential risk for mental health problems (Cacioppo & Cacioppo, 2014; Christiansen et al., 2016; Crittenden et al., 2014; Nitschke et al., 2020; Sneed et al., 2012). Several systematic reviews have documented the pandemic's psychological impact on medical workers (Luo et al., 2020; Pappa et al., 2020; Rajkumar, 2020), and the importance of psychological support and maintaining staff mental health has been emphasized (Chen et al., 2020; Kang, Li, et al., 2020; Kang, Ma, et al., 2020). Thus, medical workers, whether directly involved in diagnosis and treatment or indirectly participating in care management, are at high risk of stress owing to the threat of infection; preparations for infection control, such as masking and sanitizing; and sudden and drastic changes in workload or work content (Lai et al., 2020; Pappa et al., 2020).

Occupational therapists are typically classified as second-line medical workers and do not directly care for people with COVID-19 during the acute phase. However, they have direct contact with their clients during treatment programs, which can increase their infection risk and have a negative impact on their mental health (Ito & Ishioka, 2020). Such

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negative psychological effects can affect care quality and lead to client dissatisfaction (Escudero-Escudero et al., 2020). To prevent or mitigate negative psychological effects on occupational therapists that can harm care quality, treatment programs and environments with effective infection prevention need to be established. For example, the Italian Association of Physiotherapy suggested suspending all hands-on treatments except in the case of clients who require urgent care and continuity; the goal is to move toward options such as telerehabilitation (Pedersini et al., 2020). Although such an approach can provide effective psychological support for occupational therapists, limited reports have left unclear the extent of the COVID-19 outbreak's psychological impact on second-line workers (Lu et al., 2020; Yang et al., 2020). Specifically, few empirical reports have been published on the impact of the COVID-19 pandemic on occupational therapists' mental health.

In Japan, a nationwide state of emergency was declared by the Japanese government and imposed in Japan's prefectures from April 16 to May 6, 2020. Several prefectures in which the impact of COVID-19 was most severe were designated as being under specific cautions (i.e., where residents were strictly advised refrain from outings): Tokyo, Kanagawa, Chiba, Saitama, and Hokkaido. Japanese residents were requested to stay home as much as possible, and people in areas under specific cautions were in addition strictly prohibited from unnecessary outings; companies also largely restricted business trips.

The aim of this study was to formally investigate the psychological impact of the COVID-19 outbreak on occupational therapists and clarify the relationship between changes in social participation, such as work environment and daily life, and mental health problems, such as anxiety, depression, and insomnia. Moreover, we sought to separately clarify the risk of anxiety, depression, and insomnia in the 5 prefectures under specific cautions and in the other 42 prefectures not under specific cautions. This approach enabled us to highlight how differences in governmental constraints based on variations in pandemic severity affected occupational therapists' mental health. We were therefore able to provide detailed information on occupational therapists' psychological state and highlight the approach required to reduce or prevent psychological problems in this population.

Method

Research Protocol

This cross-sectional online survey, which was conducted using region-stratified two-stage cluster sampling, was conducted in Japan from May 28 to May 31, 2020. The data were collected through Google Forms (https://www.google.com/forms/about/). All the respondents were occupational therapists who were members of the Japanese Association of Occupational Therapists; a request for participation was sent to all the registered members on May 28, 2020, via email. The study protocol was approved by the ethical committee of Saitama Prefectural University (Acceptance 20003). All participants provided written informed consent.

Sample

Sampling was based on the number of members and ratio of men to women by prefecture as determined by the 2019 report of the Japanese Association of Occupational Therapists. The sample size was calculated using the following formula (Charan & Biswas, 2013):

$$N = Z^2_{1-\alpha/2}\, p(1-p)/d^2,$$

where N = the sample size, Z (value of Z score at the 95% confidence level) = 1.96, p = the population size, d (margin of error in estimating the mean) = 0.05, and sample proportion = 0.5. The finite population correction was applied using a population size of 12,761 (62.8% women, 37.2% men) in the five prefectures under specific cautions. The sample size for those five prefectures was 373 (62.8% women, 37.2% men), and the sample size for other 42 prefectures, considering the ratio in the prefectures under specific cautions, was 1,311 (62.0% women, 38.0% men).

Online Questionnaire

Participants were asked to report their sociodemographic characteristics: age, gender, academic background, marital status (married or unmarried), history of psychiatric disorders (yes or no), history of disorders with anxiety or depression symptoms (yes or no), employment type (full time or part time), managerial position (yes or no), and years of service (Table 1).

Effects of the Pandemic on Work Life

Participants were asked to respond to the following items concerning work life: acceptance of patients with COVID-19 at their workplace (yes or no), provision of information on COVID-19 by the workplace (7-point rating scale ranging from 1 = *never* to 7 = *sufficient*), overtime work (yes or no), short-time work (yes or no), work from home (yes or no), increased workload (yes or no), decreased workload (yes or no), changes in commuting options and time, changes in work content, and free description (fill-in-the-blank question).

Effects of the Pandemic on Daily Life

Participants were asked to respond to the following items concerning daily life: efforts to avoid getting COVID-19 (7-point rating scale ranging from 1 = *never* to 7 = *frequent*), efforts to not transmit the virus to others (7-point rating scale), frequency of contact with family (7-point rating scale), frequency of contact with friends (7-point rating scale), changes in daily step count compared with last year (which was evaluated using records automatically logged in health care applications implemented in the participants' phones), fewer outings (yes or no), attempts to avoid face-to-face

Table 1. Sociodemographic Characteristics of the Sample

Characteristic	*n* (%)		
	All 47 Prefectures (*n* = 1,683)	5 Prefectures Under Specific Cautions (*n* = 371)	42 Prefectures Without Specific Cautions (*n* = 1,312)
Age, *M* (*SD*)	35.7 (9.6)	35.4 (9.5)	35.8 (9.6)
Gender			
Female	1,046 (62.2)	234 (63.1)	812 (61.9)
Male	637 (37.8)	137 (36.9)	500 (38.1)
Academic background			
<Bachelor's	897 (53.3)	172 (46.4)	725 (55.3)
≥Bachelor's	786 (46.7)	199 (53.6)	587 (44.7)
Marital status			
Married	747 (44.4)	174 (46.9)	573 (43.7)
Unmarried	936 (55.6)	197 (53.1)	739 (56.3)
History of mental disorders			
Yes	28 (1.7)	5 (1.3)	23 (1.8)
No	1,655 (98.3)	366 (98.7)	1,289 (98.2)
Disorders with symptoms of anxiety or depression			
Yes	51 (3.0)	9 (2.4)	42 (3.2)
No	1,632 (97.0)	362 (97.6)	1,270 (96.8)
Employment type			
Full time	1,584 (94.1)	345 (93.0)	1,239 (94.4)
Part time	99 (5.9)	26 (7.0)	73 (5.6)
Managerial position			
Yes	466 (27.7)	105 (28.3)	361 (27.5)
No	1,217 (72.3)	266 (71.7)	951 (72.5)
Service years, *M* (*SD*)	11.9 (8.8)	11.3 (8.4)	12.1 (8.9)

Note. Prefectures under specific cautions were Tokyo, Kanagawa, Saitama, Chiba, and Hokkaido.

conversations (yes or no), attempts to maintain social distancing during conversations (yes or no), increased standard precautions at home (handwashing and gargling; yes or no), increased frequency of mask wearing (yes or no), increased social networking site usage (yes or no), and free description (fill-in-the-blank question).

Validated Questionnaires

On the basis of a previous study (Lai et al., 2020), we focused on symptoms of anxiety, depression, and insomnia. To assess these symptoms, we used the Zung Self-Rating Anxiety Scale (SAS; Zung, 1971), the Zung Self-Rating Depression Scale (SDS; Zung, 1965), and the Japanese version of the Insomnia Severity Index (ISI–J; Morin et al., 2011; Munezawa et al., 2009).

The SAS and SDS each have 20 items rated on a 4-point Likert scale ranging from 1 (*a little of the time*) to 4 (*most of the time*). The SAS contains 5 items concerning increased anxiety levels and 15 concerning decreased anxiety levels (Zung, 1971). The SDS includes 10 negative statements such as "I feel down and blue" and 10 reverse-scored positive statements such as "Morning is when I feel the best" (Zung, 1965). The ISI–J contains 7 questions assessing the nature, severity, and impact of insomnia, rated on a 5-point Likert scale ranging from 0 (*no problem*) to 4 (*very severe problem;* Bastien et al., 2001). In this study, the cutoffs for detecting the presence of anxiety, depression, and insomnia were ≥40 for the SAS (Dunstan & Scott, 2020), ≥50 for the SDS (Dunstan & Scott, 2019), and ≥10 for the ISI–J (Morin et al., 2011; Munezawa et al., 2009).

Statistical Analysis

Statistical analyses were conducted using jamovi 1.1.9 (https://www.jamovi.org). Fisher's Exact Test was used to compare the presence of anxiety, depression, and insomnia in prefectures with and without specific cautions. In addition, a binary logistic regression model was developed to estimate the risk of anxiety, depression, and insomnia associated with potential predictors, including changes in work life and daily life, as a result of the pandemic. Independent variables and covariates were entered simultaneously, and potential confounding variables were controlled. The variance inflation factor was used to check for multicollinearity. Raw scores on the SAS, SDS, and ISI–J were not normally distributed and are presented as medians with interquartile ranges (Table 2). The results are presented as odds ratios (ORs) with 95% confidence intervals (CIs), and the level of statistical significance was set at $p < .05$ (two-tailed).

Results

Sample Characteristics

The total number of respondents was 5,302. Data from respondents with missing data for step counts ($n = 881$) or inconsistent multiple responses ($n = 58$) or who were unemployed or currently not working because of hospitalization, maternity leave, or child care leave ($n = 8$), were excluded. From among the remaining 4,355 respondents, respondents in the 5 prefectures with specific cautions ($n = 371$) and those in the other 42 prefectures ($n = 1,312$) were randomly chosen on the basis of sample calculation (see "Sample" section for details). Sample characteristics are shown in Table 1. Forty-nine participants (2.9%) filled in the free description (fill-in-the-blank) section; all of the comments concerned changes in work environment as a result of COVID-19.

Psychological Impact

A total of 371 respondents from the 5 prefectures under specific cautions and 1,312 respondents from the other 42 prefectures showed no significant difference in presence of anxiety, depression, and insomnia (Fisher's Exact Test): 37 (10.0%) versus 154 (11.7%), $p = .404$; 37 (10.0%) versus 141 (10.7%), $p = .518$; and 54 (14.6%) versus 228 (17.4%), $p = .209$, respectively (see Table 2). Although significant differences were not observed, to investigate the effect of

Table 2. Questionnaire Results

Survey Item	*n* (%)		
	All 47 Prefectures (*n* = 1,683)	5 Prefectures Under Specific Cautions (*n* = 371)	42 Prefectures Without Specific Cautions (*n* = 1,312)
Cumulative no. of cases of COVID-19 as of the current survey, *M* (*SD*)	727 (1,245)	2,237 (1,841)	300 (453)
Presence of anxiety, depression, and insomnia (cutoff score)			
SAS (≥40)	191 (11.3)	37 (10.0)	154 (11.7)
SDS (≥50)	178 (10.6)	37 (10.0)	141 (10.7)
ISI–J (≥10)	282 (16.8)	54 (14.6)	228 (17.4)
Median score on each questionnaire (IQR)			
SAS	33 (29–37)	31 (28–36)	33 (29–37)
SDS	40 (34–47)	40 (33–46)	40 (34–47)
ISI–J	5 (2–8)	5 (3–8)	5 (2–8)
Effects of COVID-19 on Work Life			
Accepting patients with COVID-19			
Yes	280 (16.6)	75 (20.2)	205 (15.6)
No	1,403 (83.4)	296 (79.8)	1,107 (84.4)
Provision of information on COVID-19 by workplace (1 = *never*, 7 = *sufficient*)			
5–7 (above average)	1,230 (73.1)	275 (74.1)	955 (72.8)
1–3 (below average)	163 (9.7)	35 (9.4)	128 (9.8)
4	290 (17.2)	61 (16.4)	229 (17.5)
Overtime work			
Yes	57 (3.4)	15 (4.0)	42 (3.2)
No	1,626 (96.6)	356 (96.0)	1,270 (96.8)
Short-time work[a]			
Yes	131 (7.8)	38 (10.2)	93 (7.1)
No	1,552 (92.2)	333 (89.8)	1,219 (92.9)
Work from home			
Yes	97 (5.8)	36 (9.7)	61 (4.6)
No	1,586 (94.2)	335 (90.3)	1,251 (95.4)
Increased workload			
Yes	480 (28.5)	86 (23.2)	394 (30.0)
No	1,203 (71.5)	285 (76.8)	918 (70.0)
Decreased workload			
Yes	416 (24.7)	103 (27.8)	313 (23.9)
No	1,267 (75.3)	268 (72.2)	999 (76.1)
Changes in commuting options and time			
Yes	233 (13.8)	74 (19.9)	159 (12.1)
No	1,450 (86.2)	297 (80.1)	1,153 (87.9)
Changes in work content			
Yes	88 (5.2)	24 (6.5)	64 (4.9)
No	1,595 (94.8)	347 (93.5)	1,248 (95.1)
Free description (fill-in-the-blank question)			
Yes	24 (1.4)	6 (1.6)	18 (1.4)
No	1,659 (98.6)	365 (98.4)	1,294 (98.6)
Effects of COVID-19 on Daily Life			
Efforts to avoid getting COVID-19 (1 = *never*, 7 = *frequent*)			
5–7	1,654 (98.3)	365 (98.4)	1,289 (98.2)
1–3	6 (0.4)	2 (0.5)	4 (0.3)
4	23 (1.4)	4 (1.1)	19 (1.4)

(*Continued*)

Table 2. Questionnaire Results (*Cont.*)

Survey Item	*n* (%)		
	All 47 Prefectures (*n* = 1,683)	5 Prefectures Under Specific Cautions (*n* = 371)	42 Prefectures Without Specific Cautions (*n* = 1,312)
Effort not to transmit the virus to others (1 = *never,* 7 = *frequent*)			
5–7	1,644 (97.7)	366 (98.7)	1,278 (97.4)
1–3	5 (0.3)	0 (0)	5 (0.4)
4	34 (2.0)	5 (1.3)	29 (2.2)
Frequency of contact with family (1 = *never,* 7 = *frequent*)			
5–7	1,195 (71.0)	270 (72.8)	925 (70.5)
1–3	188 (11.2)	42 (11.3)	146 (11.1)
4	300 (17.8)	59 (15.9)	241 (18.4)
Frequency of contact with friends (1 = *never,* 7 = *frequent*)			
5–7	494 (29.4)	125 (33.7)	369 (28.1)
1–3	712 (42.3)	150 (40.4)	562 (42.8)
4	477 (28.3)	96 (25.9)	381 (29.0)
Changes in daily step count			
Increased	246 (14.6)	42 (11.3)	204 (15.5)
Decreased	626 (37.2)	171 (46.1)	455 (34.7)
Unchanged	811 (48.2)	158 (42.6)	653 (49.8)
Fewer outings			
Yes	1,593 (94.7)	346 (93.3)	1,247 (95.0)
No	90 (5.3)	25 (6.7)	65 (5.0)
Avoidance of face-to-face conversations			
Yes	519 (30.8)	116 (31.3)	403 (30.7)
No	1,164 (69.2)	255 (68.7)	909 (69.3)
Attempt to maintain social distancing during conversations			
Yes	751 (44.6)	177 (47.7)	574 (43.8)
No	932 (55.4)	194 (52.3)	738 (56.3)
Increased standard precautions at home			
Yes	1,477 (87.8)	336 (90.6)	1,141 (87.0)
No	206 (12.2)	35 (9.4)	171 (13.0)
Increased mask wearing			
Yes	1,591 (94.5)	353 (95.1)	1,238 (94.4)
No	92 (5.5)	18 (4.9)	74 (5.6)
Increased SNS usage			
Yes	607 (36.1)	158 (42.6)	449 (34.2)
No	1,076 (63.9)	213 (57.4)	863 (65.8)
Free description			
Yes	49 (2.9)	15 (4.0)	34 (2.6)
No	1,634 (97.1)	356 (96.0)	1,278 (97.4)

Note. Prefectures under specific cautions were Tokyo, Kanagawa, Saitama, Chiba, and Hokkaido. Percentages may not total 100 because of rounding. COVID-19 = coronavirus disease 2019; IQR = interquartile range; ISI–J = Insomnia Severity Index, Japanese version; SAS = Zung Self-Rating Anxiety Scale; SDS = Zung Self-Rating Depression Scale; SNS = social networking site.
[a]Short-time work is defined as being required to work fewer hours.

specific cautions, we performed separate binary logistic regression analyses for prefectures with and without specific cautions as of May 25, 2020.

Anxiety

In prefectures under specific cautions, avoiding face-to-face conversations was significantly associated with anxiety risk (OR = 3.34, 95% CI [1.30, 8.60], $p = .012$), and decreased workload (OR = 0.29, 95% CI [0.09, 0.96], $p = .043$) was

negatively associated with anxiety (Table 3). In prefectures without specific cautions, the variables significantly associated with anxiety risk were insufficient information provision (OR = 2.35, 95% CI [1.25, 4.42], p = .008), increased workload (OR = 1.72, 95% CI [1.12, 2.63], p = .013), increased daily step count (OR = 1.92, 95% CI [1.19, 3.10], p = .008), and avoiding face-to-face conversations (OR = 1.72, 95% CI [1.12, 2.63], p = .013; Table 4).

Depression

In prefectures under specific cautions, only increased workload was significantly associated with depression risk (OR = 2.75, 95% CI [1.02, 7.38], p = .045; see Table 3). In prefectures without specific cautions, the variables significantly associated with depression risk were increased workload (OR = 2.21, 95% CI [1.42, 3.46], p < .001), efforts not to transmit the virus to others (OR = 44.82, 95% CI [2.20, 915.34], p = .013), decreased contact with friends (OR = 1.86, 95% CI [1.15, 3.01], p = .011), and avoiding face-to-face conversations (OR = 2.25, 95% CI [1.42, 3.58], p < .001; see Table 4). Sufficient information provision (OR = 0.61, 95% CI [0.38, 0.98], p = .042) and efforts to avoid getting COVID-19 (OR = 0.02, 95% CI [0.001, 0.35], p = .006) were negatively associated with depression risk.

Insomnia

In prefectures under specific cautions, increased workload (OR = 3.45, 95% CI [1.40, 8.54], p = .007) and increased daily step count (OR = 3.63, 95% CI [1.20, 10.96], p = .022) were significantly associated with insomnia risk (see Table 3). Sufficient information provision about COVID-19 from the workplace (OR = 0.34, 95% CI [0.14, 0.79], p = .013) was negatively associated with insomnia. Increased workload was also significantly associated with insomnia (OR = 2.62, 95% CI [1.82, 3.77], p < .001) in prefectures without specific cautions (see Table 4).

Discussion

This is the first report on mental health problems and risk factors faced by Japanese occupational therapists during the COVID-19 outbreak based on region-stratified two-stage cluster sampling. Overall, 11.3%, 10.9%, and 16.8% of Japanese occupational therapists exhibited symptoms of anxiety, depression, and insomnia, respectively. The psychological impact of the COVID-19 outbreak between the 5 prefectures under specific cautions and the other 42 prefectures did not significantly differ (anxiety, 10.0% and 11.7%; depression, 10.0% and 10.7%; and insomnia, 14.6% and 17.4%, respectively). The prevalence of anxiety and depression among occupational therapists was generally lower than among frontline medical workers (Luo et al., 2020), supporting previous findings that such variations might be due to the differences in exposure to infection between occupational therapists and frontline medical workers (Lai et al., 2020). Notably, the prevalence of anxiety and depression among occupational therapists in Japan was lower than among South Korean physical therapists (anxiety, 32.3%, and depression, 18.5%; Yang et al., 2020). The different prevalence rates of psychological problems among second-line medical staff might vary across countries and care systems, as do those among frontline medical workers (Luo et al., 2020). To elaborate on the factors behind such differences, international data sharing and collaboration among national occupational therapy associations must be leveraged.

Here, we provide the first evidence of the relationship between the psychological impact of COVID-19 and social participation, including work state and daily life, among Japanese occupational therapists in regions with differing pandemic severity levels. Our findings indicate that the attempt to avoid face-to-face conversations is associated with anxiety, regardless of area. These findings are consistent with those of an Italian survey wherein the link between perceived social isolation and perceived COVID-19 impact on health status was mediated by perceived distress (Cerami et al., 2020). Overall, it is plausible that the attempt to avoid face-to-face conversation may lead to psychological distress, increasing the risk of anxiety.

Table 3. Binary Logistic Regression Results Concerning Mental Health Decline Among Occupational Therapists From Prefectures Under Specific Cautions

Variables	SAS				SDS				ISI–J			
	N				*n*				*n*			
	Score ≥40	Score <40	OR [95% CI]	*p*	Score ≥50	Score <50	OR [95% CI]	*p*	Score ≥10	Score <10	OR [95% CI]	*p*
Effects of COVID-19 on Work Style												
Accepting patients with COVID-19												
Yes	6	69	0.541 [0.173, 1.692]	.291	4	71	0.360 [0.097, 1.330]	.125	9	66	0.627 [0.244, 1.610]	.333
No (Ref.)	31	265	1.000	—	33	263	1.000	—	45	251	1.000	—
Provision of information about COVID-19 by workplace (1 = *never*, 7 = *sufficient*)												
5–7 (above average)	26	249	0.582 [0.194, 1.739]	.332	22	253	0.403 [0.144, 1.130]	.083	31	244	0.335 [0.142, 0.791]	.013*
1–3 (below average)	4	31	0.468 [0.095, 2.300]	.350	6	29	1.050 [0.259, 4.240]	.945	8	27	0.772 [0.227, 2.625]	.679
4 (Ref.)	7	54	1.000	—	9	52	1.000	—	15	46	1.000	—
Overtime work												
Yes	1	14	0.149 [0.013, 0.632]	.119	2	13	0.652 [0.103, 4.090]	.648	3	12	0.729 [0.136, 3.889]	.711
No (Ref.)	36	320	1.000	—	35	321	1.000	—	51	305	1.000	—
Short-time work[a]												
Yes	2	36	0.362 [0.066, 1.960]	.238	4	34	1.077 [0.283, 4.090]	.913	4	34	0.454 [0.119, 1.722]	.246
No (Ref.)	35	298	1.000	—	33	300	1.000	—	50	283	1.000	—
Work from home												
Yes	2	34	0.207 [0.026, 1.628]	.134	3	33	0.956 [0.182, 5.010]	.958	6	30	2.113 [0.579, 7.711]	.257
No (Ref.)	35	300	1.000	—	34	301	1.000	—	48	287	1.000	—
Increased workload												
Yes	12	74	2.365 [0.913, 6.127]	.076	12	74	2.746 [1.021, 7.380]	.045*	16	70	3.454 [1.397, 8.538]	.007*
No (Ref.)	25	260	1.000	—	25	260	1.000	—	38	247	1.000	—
Decreased workload												
Yes	6	97	0.292 [0.088, 0.964]	.043*	8	95	0.747 [0.256, 2.180]	.593	16	87	1.676 [0.713, 3.939]	.236
No (Ref.)	31	237	1.000	—	29	239	1.000	—	38	230	1.000	—
Changes in commuting options and time												
Yes	10	64	1.622 [0.591, 4.448]	.347	10	64	1.328 [0.479, 3.670]	.585	13	61	1.008 [0.410, 2.478]	.985
No (Ref.)	27	270	1.000	—	27	270	1.000	—	41	256	1.000	—
Changes in work content												
Yes	4	20	1.766 [0.436, 7.134]	.425	3	21	1.254 [0.273, 5.760]	.771	6	18	2.965 [0.881, 9.974]	.079
No (Ref.)	33	314	1.000	—	34	313	1.000	—	48	299	1.000	—

(*Continued*)

Table 3. Binary Logistic Regression Results Concerning Mental Health Decline Among Occupational Therapists From Prefectures Under Specific Cautions (*Cont.*)

Variables	SAS				SDS				ISI–J			
	N				*n*				*n*			
	Score ≥40	Score <40	OR [95% CI]	*p*	Score ≥50	Score <50	OR [95% CI]	*p*	Score ≥10	Score <10	OR [95% CI]	*p*
Free description												
Yes	2	4	6.46 [0.622, 67.012]	.118	2	4	8.058 [0.875, 74.200]	.065	2	4	5.56 [0.648, 47.659]	.118
No (Ref.)	35	330	1.000	—	35	330	1.000	—	52	313	1.000	—
Effects of the COVID-19 Outbreak on Daily Lifestyle												
Efforts to avoid getting COVID-19 (1 = *never*, 7 = *frequent*)												
5–7	36	329	0.115 [0.004, 3.105]	.198	36	329	1.282 [0.046, 35.470]	.883	1	3	0.277 [0.013, 5.730]	.407
1–3	0	2	7.73E-08 [0.000, Inf]	.997	0	2	9.59E-07 [0.000, Inf]	.996	53	312	4.63E-07 [0.000, Inf]	.989
4 (Ref.)	1	3	1.000	—	1	3	1.000	—	0	2	1.000	—
Effort not to transmit the virus to others (1 = *never*, 7 = *frequent*)												
5–7	37	329	4.87E+07 [0.000, Inf]	.994	35	331	0.125 [0.007, 2.330]	.163	53	313	1.607 [0.092, 27.868]	.744
1–3	0	0	—	—	0	0	—	—	0	0	—	—
4 (Ref.)	0	5	1.000	—	2	3	1.000	—	1	4	1.000	—
Frequency of contact with family (1 = *never*, 7 = *frequent*)												
5–7	30	240	1.850 [0.539, 6.340]	.328	24	246	0.709 [0.233, 2.150]	.543	36	234	0.779 [0.299, 2.030]	.610
1–3	3	39	0.800 [0.125, 5.095]	.813	6	36	0.850 [0.196, 3.670]	.828	8	34	1.020 [0.289, 3.596]	.975
4 (Ref.)	4	55	1.000	—	7	52	1.000	—	10	49	1.000	—
Frequency of contact with friends (1 = *never*, 7 = *frequent*)												
5–7	14	111	1.135 [0.393, 3.277]	.814	17	108	2.260 [0.691, 7.390]	.177	20	105	1.061 [0.425, 2.649]	.898
1–3	13	137	0.767 [0.264, 2.219]	.624	14	136	1.459 [0.438, 4.860]	.538	20	130	0.748 [0.304, 1.842]	.529
4 (Ref.)	10	86	1.000	—	6	90	1.000	—	14	82	1.000	—
Changes in daily step count												
Increased	17	154	1.653 [0.451, 6.057]	.448	6	36	1.717 [0.493, 5.970]	.395	10	32	3.632 [1.204, 10.957]	.022*
Decreased	6	36	1.243 [0.493, 3.131]	.644	20	151	1.467 [0.597, 3.600]	.403	29	142	1.557 [0.718, 3.377]	.262
Unchanged (Ref.)	14	144	1.000	—	11	147	1.000	—	15	143	1.000	—

(*Continued*)

Table 3. Binary Logistic Regression Results Concerning Mental Health Decline Among Occupational Therapists From Prefectures Under Specific Cautions (*Cont.*)

	SAS				SDS				ISI–J			
	N				*n*				*n*			
Variables	Score ≥40	Score <40	OR [95% CI]	*p*	Score ≥50	Score <50	OR [95% CI]	*p*	Score ≥10	Score <10	OR [95% CI]	*p*
Fewer outings												
Yes	36	310	3.172 [0.186, 53.827]	.424	35	311	0.898 [0.138, 5.850]	.911	51	295	0.957 [0.176, 5.191]	.960
No (Ref.)	1	24	1.000	—	2	23	1.000	—	3	22	1.000	—
Avoiding face-to-face conversations												
Yes	18	98	3.341 [1.297, 8.600]	.012*	15	101	1.851 [0.738, 4.640]	.189	17	99	0.763 [0.345, 1.686]	.505
No (Ref.)	19	236	1.000	—	22	233	1.000	—	37	218	1.000	—
Attempt to keep social distance when talking to others												
Yes	20	157	1.050 [0.418, 2.632]	.918	18	159	0.804 [0.332, 1.940]	.629	24	153	0.780 [0.370, 1.648]	.516
No (Ref.)	17	177	1.000	—	19	175	1.000		30	164	1.000	—
Increased standard precautions at home												
Yes	34	302	2.441 [0.471, 12.642]	.288	33	303	1.178 [0.305, 4.550]	.812	49	287	1.311 [0.373, 4.602]	.672
No (Ref.)	3	32	1.000	—	4	31	1.000	—	5	30	1.000	—
Increased mask wearing												
Yes	34	319	0.145 [0.020, 1.038]	.055	35	318	0.272 [0.039, 1.860]	.185	53	300	4.771 [0.445, 51.090]	.196
No (Ref.)	3	15	1.000	—	2	16	1.000	—	1	17	1.000	—
Increased SNS usage												
Yes	20	138	1.547 [0.664, 3.605]	.312	23	135	1.955 [0.852, 4.490]	.114	32	126	1.858 [0.926, 3.727]	.081
No (Ref.)	17	196	1.000	—	14	199	1.000	—	22	191	1.000	—
Free description												
Yes	0	15	4.29E-08 [0.000, Inf]	.991	0	15	9.54E-08 [0.000, Inf]	.986	1	14	0.351 [0.039, 3.127]	.348
No (Ref.)	37	319	1.000	—	37	319	1.000	—	53	303	1.000	—

Note. *N* = 371. In this model, independent variables and covariates were entered simultaneously, and potential confounding variables were controlled. Covariates were standardized age, gender dummy (female = 1, male = 0), academic background level dummy (<bachelor's = 1, ≥bachelor's = 0), marital status dummy (unmarried = 1, married = 0), psychiatric disorder dummy (no = 1, yes = 0), disorders with symptoms of anxiety or depression dummy (no = 1, yes = 0), employment type dummy (part time = 1, full time = 0), managerial position (yes = 1, no = 0), standardized service years, and standardized cumulative number of cases as of the current survey. Dashes indicate data that are not applicable. COVID-19 = coronavirus disease 2019; CI = confidence interval; Inf = infinity; ISI–J = Insomnia Severity Index, Japanese version; OR = odds ratio; Ref. = reference; SAS = Zung Self-Rating Anxiety Scale; SDS = Zung Self-Rating Depression Scale; SNS = social networking site.

[a]Short-time work is defined as being required to work fewer hours.

*$p < .05$.

Intriguingly, increased workload was significantly related to increased anxiety, depression, and insomnia, regardless of area. These findings are in accord with the results of a meta-analysis on burnout among mental health professionals (O'Connor et al., 2018) that suggested that role clarity, professional autonomy, a sense of fair treatment, and access to regular clinical supervision may support workers. Although direct evidence is needed, these factors, in addition to reduced workload and enhanced communication, can be significant in preventing burnout among occupational therapists (Escudero-Escudero et al., 2020). In our study, in prefectures under specific cautions, sufficient information from the workplace significantly reduced insomnia risk, whereas in other areas it significantly reduced depression risk. These findings support recent studies on the relationship between the psychological impact of an infectious outbreak and the amount of information provided by one's workplace (Matsuishi et al., 2012; Sin & Huak, 2004). Information provision by the workplace may indirectly support occupational therapists' mental health by contributing to role clarity and a sense of fair treatment.

Infection prevention efforts were effective in reducing depression risk in prefectures without specific cautions. This supports the results of a previous study that demonstrated the link between the frequency of preventive measures, such as avoiding sharing utensils, handwashing, and wearing masks, and anxiety and depression levels in the general population (Wang et al., 2020). In contrast, infection prevention efforts were not significantly related to depression in the prefectures under specific cautions. Although Japanese occupational therapists generally pay considerable attention to infection prevention and show a certain ceiling effect, these differences can still be explained by the ostensible difference in the rate of increase in standard precautions at home, such as handwashing and gargling (areas with specific cautions, 90.6%; areas without specific cautions, 87.0%). Nevertheless, regardless of area, intensive efforts to accomplish substantial improvement in infection prevention practices are needed because they can protect and support not only clients but also therapists and can reduce the risk of mental health problems.

Limitations

In this survey, we did not use a control group of frontline workers, such as physicians and nurses, or second-line workers, such as physical therapists and speech therapists, because our primary focus was a detailed exploration of the impact of COVID-19 on the mental health of occupational therapists in Japan. Therefore, we were unable to determine whether these results were unique to occupational therapists. Moreover, this study was cross-sectional; therefore, we are unable to make causal inferences.

We should also note that this study was a one-shot survey and could not capture the dynamic relationship between the mental health of occupational therapists and the pandemic. A longitudinal follow-up survey is needed to explain how COVID-19 has affected the occupational therapy community and how occupational therapists are adjusting to the current challenging situation.

Internal comparisons are also needed to infer how differences between health care systems are related to occupational therapists' mental health problems. We hope that international data sharing and collaboration with national professional associations will be leveraged to support occupational therapists worldwide.

Implications for Occupational Therapy Practice

The findings from this study have the following implications for occupational therapy practice:

- Excessive workload and attempts to minimize face-to-face conversations should be avoided.
- Institutional support for occupational therapists, such as facilitating information updates and sufficient communication, is essential to mitigate mental health problems.

Table 4. Binary Logistic Regression Results Concerning Mental Health Decline Among Occupational Therapists From Prefectures Without Specific Cautions

Variables	SAS				SDS				ISI–J			
	N				*n*				*N*			
	Score ≥40	Score <40	OR [95% CI]	*p*	Score ≥50	Score <50	OR [95% CI]	p	Score ≥10	Score <10	OR [95% CI]	*p*
Effects of COVID-19 on Work Style												
Acceptance of patients with COVID-19												
Yes	17	188	0.622 [0.354, 1.092]	.099	21	184	0.893 [0.517, 1.542]	.685	27	178	0.710 [0.448, 1.123]	.143
No (Ref.)	137	970	1.000	—	120	987	1.000	—	201	906	1.000	—
Information provision about COVID-19 by workplace (1 = *never*, 7 = *sufficient*)												
5–7 (above average)	99	856	0.985 [0.605, 1.605]	.954	85	870	0.612 [0.381, 0.982]	.042*	154	801	0.780 [0.525, 1.158]	.218
1–3 (below average)	29	99	2.352 [1.252, 4.418]	.008*	21	107	0.949 [0.484, 1.860]	.879	29	99	1.069 [0.604, 1.893]	.818
4 (Ref.)	26	203	1.000	—	35	194	1.000	—	45	184	1.000	—
Overtime work												
Yes	9	33	1.593 [0.671, 3.779]	.291	9	33	1.694 [0.664, 4.323]	.269	15	27	2.002 [0.978, 4.095]	.057
No (Ref.)	145	1,125	1.000	—	132	1,138	1.000	—	213	1,057	1.000	—
Short-time work												
Yes	7	86	0.888 [0.380, 2.077]	.785	7	86	1.087 [0.438, 2.693]	.857	12	81	0.941 [0.478, 1.849]	.859
No (Ref.)	147	1,072	1.000	—	134	1,085	1.000	—	216	1,003	1.000	—
Work from home												
Yes	4	57	0.594 [0.197, 1.788]	.355	1	60	0.177 [0.023, 1.367]	.097	8	53	0.785 [0.336, 1.832]	.576
No (Ref.)	150	1,101	1.000	—	140	1,111	1.000	—	220	1,031	1.000	—
Increased workload												
Yes	63	331	1.716 [1.121, 2.627]	.013*	63	331	2.213 [1.418, 3.455]	<.001*	105	289	2.617 [1.816, 3.770]	<.001*
No (Ref.)	91	827	1.000	—	78	840	1.000	—	123	795	1.000	—
Decreased workload												
Yes	28	285	0.943 [0.574, 1.551]	.819	19	294	0.632 [0.354, 1.129]	.121	49	264	1.454 [0.962, 2.197]	.075
No (Ref.)	126	873	1.000	—	122	877	1.000	—	179	820	1.000	—
Changes in commuting options and time												
Yes	15	144	0.963 [0.523, 1.774]	.905	19	140	1.376 [0.755, 2.507]	.297	25	134	0.976 [0.593, 1.605]	.924
No (Ref.)	139	1,014	1.000	—	122	1,031	1.000		203	950	1.000	—
Changes in work content												
Yes	6	58	0.787 [0.314, 1.971]	.609	5	59	0.846 [0.310, 2.307]	.745	7	57	0.700 [0.298, 1.643]	.413
No (Ref.)	148	1,100	1.000	—	136	1,112	1.000	—	221	1,027	1.000	—

(*Continued*)

Table 4. Binary Logistic Regression Results Concerning Mental Health Decline Among Occupational Therapists From Prefectures Without Specific Cautions (*Cont.*)

	SAS				SDS				ISI–J			
	N				*n*				*N*			
Variables	Score ≥40	Score <40	OR [95% CI]	*p*	Score ≥50	Score <50	OR [95% CI]	p	Score ≥10	Score <10	OR [95% CI]	*p*
Free description												
Yes	4	14	2.141 [0.599, 7.653]	.241	2	16	1.848 [0.363, 9.399]	.459	3	15	1.009 [0.261, 3.891]	.989
No (Ref.)	150	1,144	1.000	—	139	1,155	1.000	—	225	1,069	1.000	—
Effects of the COVID-19 Outbreak on Daily Lifestyle												
Efforts to avoid getting COVID-19 (1 = *never*, 7 = *frequent*)												
5–7	152	1,137	0.862 [0.11, 6.735]	.887	136	1,153	0.024 [0.001, 0.349]	.006*	5	14	0.385 [0.083, 1.771]	.22
1–3	0	4	9.36E-07 [0.000, Inf]	.972	0	4	3.99E-08 [0.000, Inf]	.985	223	1,066	7.61E-07 [0.000, Inf]	.973
4 (Ref.)	2	17	1.000	—	5	14	1.000	—	0	4	1.000	—
Effort not to transmit the virus to others (1 = *never*, 7 = *frequent*)												
5–7	151	1,127	2.547 [0.364, 17.789]	.346	139	1,139	44.824 [2.195, 915.340]	.013*	221	1,057	1.378 [0.365, 5.191]	.636
1–3	1	4	12.463 [0.282, 549.600]	.192	0	5	4.20E-05 [0.000, Inf]	.99	1	4	3.282 [0.128, 83.952]	.472
4 (Ref.)	2	27	1.000	—	2	27	1.000	—	6	23	1.000	—
Frequency of contact with family (1 = *never*, 7 = *frequent*)												
5–7	104	821	1.338 [0.815, 2.197]	.249	79	846	0.862 [0.528, 1.407]	.553	152	773	1.025 [0.682, 1.541]	.904
1–3	25	121	1.685 [0.877, 3.239]	.117	31	115	1.575 [0.840, 2.956]	.157	35	111	1.410 [0.809, 2.456]	.225
4 (Ref.)	25	216	1.000	—	31	210	1.000	—	41	200	1.000	—
Frequency of contact with friends (1 = *never*, 7 = *frequent*)												
5–7	37	332	0.838 [0.503, 1.395]	.497	27	342	0.733 [0.41, 1.311]	.296	72	297	1.320 [0.872, 1.999]	.189
1–3	79	483	1.332 [0.854, 2.078]	.205	81	481	1.861 [1.149, 3.013]	.011*	101	461	1.167 [0.794, 1.714]	.432
4 (Ref.)	38	343	1.000		33	348	1.000	—	55	326	1.000	—
Changes in daily step count												
Increased	57	398	1.915 [1.185, 3.096]	.008*	26	178	1.027 [0.596, 1.769]	.923	45	159	1.485 [0.975, 2.259]	.065
Decreased	36	168	1.521 [0.999, 2.314]	.05	46	409	0.946 [0.607, 1.474]	.808	85	370	1.374 [0.967, 1.952]	.076
Unchanged (Ref.)	61	592	1.000	—	69	584	1.000	—	98	555	1.000	—
Fewer outings												
Yes	142	1,105	0.506 [0.247, 1.037]	.063	132	1,115	0.469 [0.205, 1.075]	.074	215	1,032	0.767 [0.390, 1.508]	.442
No (Ref.)	12	53	1.000	—	9	56	1.000	—	13	52	1.000	—

(*Continued*)

Table 4. Binary Logistic Regression Results Concerning Mental Health Decline Among Occupational Therapists From Prefectures Without Specific Cautions (*Cont.*)

	SAS				SDS				ISI–J			
	N				*n*				*N*			
Variables	Score ≥40	Score <40	OR [95% CI]	*p*	Score ≥50	Score <50	OR [95% CI]	p	Score ≥10	Score <10	OR [95% CI]	*p*
Avoiding face-to-face conversations												
Yes	60	343	1.725 [1.119, 2.659]	.013*	62	341	2.254 [1.418, 3.581]	<.001*	81	322	1.229 [0.853, 1.771]	.268
No (Ref.)	94	815	1.000	—	79	830	1.000	—	147	762	1.000	—
Attempt to keep social distance when talking to others												
Yes	69	505	0.867 [0.568, 1.323]	.509	62	512	0.799 [0.505, 1.265]	.339	106	468	1.037 [0.729, 1.475]	.838
No (Ref.)	85	653	1.000	—	79	659	1.000	—	122	616	1.000	—
Increased standard precautions at home												
Yes	135	1,006	1.221 [0.665, 2.243]	.518	126	1,015	1.816 [0.898, 3.671]	.097	205	936	1.521 [0.881, 2.626]	.132
No (Ref.)	19	152	1.000	—	15	156	1.000	—	23	148	1.000	—
Increased mask wearing												
Yes	143	1,095	0.645 [0.287, 1.449]	.289	131	1,107	0.506 [0.205, 1.244]	.138	216	1,022	0.867 [0.410, 1.834]	.709
No (Ref.)	11	63	1.000	—	10	64	1.000	—	12	62	1.000	—
Increased SNS usage												
Yes	58	391	1.053 [0.716, 1.549]	.792	58	391	1.251 [0.828, 1.890]	.287	85	364	1.007 [0.726, 1.398]	.964
No (Ref.)	96	767	1.000	—	83	780	1.000	—	143	720	1.000	—
Free description												
Yes	6	28	1.471 [0.523, 4.138]	.464	2	32	0.484 [0.098, 2.396]	.374	7	27	1.42 [0.560, 3.596]	.459
No (Ref.)	148	1,130	1.000	—	139	1,139	1.000	—	221	1,057	1.000	—

Note. *N* = 1,312. In this model, independent variables and covariates were entered simultaneously, and potential confounding variables were controlled. Covariates were standardized age, gender dummy (female = 1, male = 0), academic background level dummy (<bachelor's = 1, ≥bachelor's = 0), marital status dummy (unmarried = 1, married = 0), psychiatric disorder dummy (no = 1, yes = 0), disorders with symptoms of anxiety or depression dummy (no = 1, yes = 0), employment type dummy (part time = 1, full time = 0), managerial position (yes = 1, no = 0), standardized service years, and standardized cumulative number of cases as of the current survey. Dashes indicate data that are not applicable. COVID-19 = coronavirus disease 2019; CI = confidence interval; Inf = infinity; ISI–J = Insomnia Severity Index, Japanese version; OR = odds ratio; Ref. = reference; SAS = Zung Self-Rating Anxiety Scale; SDS = Zung Self-Rating Depression Scale; SNS = social networking site.
*$p < .05$.

Conclusion

We investigated the psychological impact of COVID-19 on Japanese occupational therapists by specifically focusing on anxiety, depression, and insomnia and their relation to work life and daily life. Increased workload and an attempt to avoid face-to-face conversations were associated with an increased risk of psychological problems. Sufficient information from the workplace and efforts to prevent transmission of COVID-19 were associated with decreased risk of psychological problems. These results highlight the urgent need for institutional support for occupational therapists, to facilitate information updates and sufficient communication, and further personal infection prevention efforts by occupational therapists themselves. By doing so, clients can receive high-quality care even in challenging situations.

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