


Article

# Association between Self-Restraint Behavior, Stigma and Depressive Tendency in Office Workers during the COVID-19 Pandemic in Japan—Self-Restraint Behavior and Depression during the COVID-19

Ryoko Katsuki <sup>1</sup>, Hiroaki Kubo <sup>1</sup>, Itsuki Yamakawa <sup>2,3</sup>, Naotaka Shinfuku <sup>4</sup>, Norman Sartorius <sup>5</sup> , Shinji Sakamoto <sup>3</sup> and Takahiro A. Kato <sup>1,\*</sup>

- <sup>1</sup> Department of Neuropsychiatry, Graduate School of Medical Sciences, Kyushu University, Fukuoka 812-8582, Japan; rkatsuki@npsych.med.kyushu-u.ac.jp (R.K.); hi-kubo@med.kyushu-u.ac.jp (H.K.)
  - <sup>2</sup> Department of Health and Human Services, Faculty of Medical and Welfare, Tohoku Bunka Gakuen University, Miyagi 981-8551, Japan; yamakawa.itsuki@gmail.com
  - <sup>3</sup> Department of Psychology, College of Humanities and Sciences, Nihon University, Tokyo 102-8275, Japan; jcb00146@nifty.com
  - <sup>4</sup> School of Human Sciences, Seinan Gakuin University, Fukuoka 814-8511, Japan; shinfukunaotaka@gmail.com
  - <sup>5</sup> Association for the Improvement of Mental Health Programmes, 1209 Geneva, Switzerland; sartorius@normansartorius.com
- \* Correspondence: takahiro@npsych.med.kyushu-u.ac.jp or kato.takahiro.015@m.kyushu-u.ac.jp; Tel.: +81-92-642-5627



**Citation:** Katsuki, R.; Kubo, H.; Yamakawa, I.; Shinfuku, N.; Sartorius, N.; Sakamoto, S.; Kato, T.A. Association between Self-Restraint Behavior, Stigma and Depressive Tendency in Office Workers during the COVID-19 Pandemic in Japan—Self-Restraint Behavior and Depression during the COVID-19. *Psychiatry Int.* **2021**, *2*, 300–309. <https://doi.org/10.3390/psychiatryint2030023>

Academic Editor: Roger C. M. Ho

Received: 18 June 2021

Accepted: 19 July 2021

Published: 3 August 2021

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Abstract:** Background: The COVID-19 pandemic has forced people to change their lifestyles, especially with respect to restrictions on going out. Forced quarantine (i.e., lockdown) and self-restraint behavior (SRB), including self-quarantine, are suggested to induce potential negative impacts on public mental health. SRB seems to be related to governmental policies, each individual's social background and mental condition; however, no empirical studies have been conducted. Methods: 1053 participants (mainly office workers) from epidemic areas and non-epidemic areas in Japan voluntarily conducted an online survey in June 2020. We assessed COVID-19-related aspects such as the degree of SRB, motivation for SRB, stigma, anxiety and depressive feelings due to COVID-19 by original questionnaires) and general mental health status (social anxiety by MINI-SPIN, depressive tendency by PHQ-9, depression-related personality traits by TACS-22 and resilience by TRS). Results: Regional comparison showed significant differences in SRB and social anxiety. People in epidemic areas tend to refrain from going out. Conversely, people in non-epidemic areas tend to shun the public eye. Regardless of epidemic status, proactive SRB was associated with higher motivation for SRB, higher social anxiety, higher depressive tendency, stronger COVID-19-related psychological factors and lower resilience. Moreover, people with proactive SRB in non-epidemic areas had the highest depressive tendency. Discussion: The present cross-sectional survey among office workers in Japan showed that people with proactive SRB have stronger COVID-19-related anxiety and depressive feelings, regardless of where they live. Our key finding is that people with proactive SRB in non-epidemic areas have the highest depressive tendency. Based on the present finding, we herein propose the following hypothesis: Higher levels of depressive tendency may enhance proactive SRB, which may be partly associated with higher levels of stigma, anxiety and depressive feelings related to COVID-19. Limitations: The general tendencies to avoid danger and stigma were not evaluated. Conclusions: Depressive tendency is suggested to be associated with proactive SRB against COVID-19. Intervention for depressive tendency in non-clinical settings (e.g., workplaces) may help citizens understand the infectious situation appropriately and to behave effectively during the pandemic. Further investigations should be conducted to clarify the present findings.

**Keywords:** depression; social anxiety; COVID-19-related stigma; self-restraint behavior; resilience

## 1. Introduction

### *Background*

The pandemic of COVID-19 has forced people to change their lifestyles especially regarding the restrictions on going out [1]. In early 2020, countries such as China, Italy, India, Spain and the United Kingdom imposed national lockdown to control the COVID-19 [2–4]. Although these policies have helped to control the spread of the disease, it is suggested that the lockdowns had a negative impact on public mental health and the effect may continue [5–15].

Unique in Japan, the government declared a state of emergency on 7 April 2020 in order to request self-restraint behavior (hereafter SRB) from its citizens, including self-quarantine in seven prefectures where the number of infections had increased sharply. On 16 April, the request was extended to the whole country and thirteen prefectures (mainly urban areas) were declared to be in need of special attention. This government's action with respect to the COVID-19 pandemic in Japan was unique in that, unlike lockdowns in other countries, there were no legal penalties.

As recent research in Japan pointed out, people's going-out behavior was suppressed under the declaration and the request even without penalties and the trend continued after the declaration was lifted [16]. Therefore, it is possible that requests for behavioral restrictions under a state of emergency in Japan may have public mental health implications similar to the above-mentioned countries.

How strictly an individual engages in SRB may be influenced not only by a policy of the government but also by the characters each individual possesses.

Previous studies have suggested that the personality tendency to avoid danger is related to the likeliness of an individual to become anxious and depressed [17,18]. Interestingly, Qian and Yahara have suggested that personality tendencies, morality and ideology are associated with SRB during COVID-19 pandemic in Japan [19]. Moreover, Muto et al. have indicated the typical characteristics of people reluctant to implement proper prevention measures (including SRB) are male, younger (under 30 years old), unmarried, with a drinking or smoking habit, higher extraversion and from lower-income households [20].

However, there are no studies that investigated relationship between SRB and the vulnerable aspects of the mental health status that can be risk factors for further mental health problems.

In the case of infectious disease outbreaks, stigma may increase mental health problems and contribute to the spread of infection due to delays in medical examinations [21–23]. Carmen H Logie has proposed that “Stigma is produced in social processes of labeling that differentiate persons characterized as ‘normal’ from the ‘abnormal’ other” [24]. Now in Japan, serious criticisms toward “people who go out”, such as anonymous slander against visitors from epidemic area, are reported [25]. These phenomena are so-called “Jishuku Keisatsu”, meaning that lay persons act similar to police officers and denounce “persons who don't obey the self-restraint request” during the COVID-19 pandemic [26].

However, as far as we know, there is no empirical data on the link between COVID-19, SRB, stigma related to COVID-19 and mental health.

Therefore, the present study examined how the degree of SRB is associated with COVID-19 regional epidemic status, COVID-19-related factors (motivation for SRB, stigma, anxiety and depressive feelings) and general mental health status (social anxiety, depressive tendency, depression-related personality traits and resilience) among residents (office workers) throughout Japan during the COVID-19 pandemic.

## 2. Methods

### *2.1. Data Collection*

This study was performed in accordance with the Declaration of Helsinki and was approved by the ethics committees of Nihon University and Kyushu University, Japan. We conducted a cross-sectional study by using an online survey company (Cross Marketing

Inc., Tokyo, Japan). Participants agreed to join the study after being informed that their anonymity would be maintained and that participation was voluntary.

A set of screening survey was sent to 2182 respondents and 1509 responded to the screening questions. Among them, 1178 respondents who were full-time employees as of April 2019 participated in the online survey between 10 June 2020 and 19, one year before the study. Trap questions were set to maintain the reliability of the responses and the data of 1053 respondents who passed the trap questions were used in the analysis.

All respondents were asked region of residence at the time they answered the questionnaire. Thirteen prefectures (Hokkaido, Ibaraki, Saitama, Chiba, Tokyo, Kanagawa, Gifu, Aichi, Ishikawa, Kyoto, Osaka, Hyogo and Fukuoka) that the Japanese government had designated as “specific warning prefectures” were extracted as epidemic areas of COVID-19 (hereafter, “epidemic areas”). The remaining 34 prefectures were considered as non-pandemic areas of COVID-19 (hereafter, “non-epidemic areas”).

## 2.2. Measures

We assessed the degree of SRB during the COVID-19 pandemic (score range from 2 to 8). Likewise, we assessed the degree of motivation for SRB (score range 7 to 28) by asking for reasons that resulted (or did not result) in a respondent’s willingness to behave. In addition, we used original scales to assess the following aspects that are directly related to COVID-19: stigma (score range from 5 to 20); anxiety (score range from 6 to 24); and depressive feelings (score range from 4 to 16) (Table 1).

**Table 1.** Questions about self-restraint behavior (SRB) and COVID-19-related factors.

(The Following Instructions and Sentences Were Shown to the Respondents.) How Much Has the COVID-19 Pandemic Affected Your Daily Life? As of June 2020 and Presently, What Are Your Thoughts and Feelings about the Following Items?				
	Strongly Disagree	Disagree	Agree	Strongly Agree
1. I proactively avoid direct social interaction.	1	2	3	4
2. I proactively refrain from going out of the house.	1	2	3	4
3 <sup>†</sup> . There is a limit to my patience, so I think it is better to act as freely as possible.	1	2	3	4
4 <sup>†</sup> . I think I can go anywhere I want because there are no punitive laws with movement restriction.	1	2	3	4
5. I think we need to refrain from moving because the populations in Japan are putting up with it.	1	2	3	4
6 <sup>†</sup> . In order to relieve stress, I think it is unavoidable to behave in a manner that breaks the rule of avoiding “three Cs”.	1	2	3	4
7 <sup>†</sup> . Even if there is a chance I am infected with the COVID-19, I still want to go out and take a break.	1	2	3	4
8 <sup>†</sup> . Even if there is a chance that I am infected with the COVID-19, I still want to see people for a break.	1	2	3	4
9. To prevent the spread of the COVID-19, I think it is necessary to refrain from moving.	1	2	3	4
10. I do not want to be around people who have coughs, fevers and other cold symptoms.	1	2	3	4
11. I do not want to be around people from foreign countries or domestic epidemic areas of the COVID-19.	1	2	3	4
12. I do not want to be anywhere near health care workers.	1	2	3	4
13. If I know from the license plate number that a car came from an epidemic area, I get nervous that I am going to be exposed to COVID-19.	1	2	3	4
14. If I know from the license plate number that the car is from an epidemic area, I feel “Restrain yourself and don’t come here!” and become annoyed.	1	2	3	4
15. I am scared of getting infected with the COVID-19 from people around me.	1	2	3	4
16. I am scared of transmitting the COVID-19 to others.	1	2	3	4
17. I am worried about my job status (employment, termination, leave of absence, job change, etc.).	1	2	3	4
18. I am worried about my money (income, guaranteed absence from work, etc.).	1	2	3	4
19. I am worried about my physical health.	1	2	3	4
20. I am worried about my mental health.	1	2	3	4
21. I feel tired.	1	2	3	4
22. I feel irritated and angry.	1	2	3	4
23. I feel depressed.	1	2	3	4
24. I feel lonely.	1	2	3	4

The degree of self-restraint behavior: 1 and 2. The degree of motivation for self-restraint behavior: 3, 4, 5, 6, 7, 8 and 9. COVID-19-related stigma: 10, 11, 12, 13 and 14. COVID-19-related anxiety: 15, 16, 17, 18, 19 and 20. COVID-19-related depressive feelings: 21, 22, 23 and 24.

<sup>†</sup> Item was reverse-scored.

Regarding mental health status, the nine-item Patient Health Questionnaire (PHQ-9; score range from 0 to 27) was used to assess the severity of depressive tendencies [27]. The MINI-Social Phobia Inventory (MINI-SPIN; score range from 0 to 12) for screening social anxiety disorder (SAD) [28], the 22-item Tarumi's Modern-Type Depression Trait Scale: Avoidance of Social Roles, Complaint and Low Self-Esteem (TACS-22; score range from 0 to 88) [29] and the Tachikawa resilience scale (TRS; score range from 0 to 60) [30] were also used.

### 2.3. Statistical Analysis

We used Student's *t*-test or chi-squared test to compare data between epidemic areas and non-epidemic areas. A  $2 \times 2$  ANOVA with between-subjects factor of region of residence (epidemic areas and non-epidemic areas) and between-subjects factor of SRB (proactive and reluctant) was conducted. The degree of SRB was distinguished based on the point of 5.11 as a mean of SRB scores of all 1053 participants in this study.

All analyses were conducted using IBM SPSS 24 Advanced Statistics for Mac OS with two-sided alpha = 0.05.

### 3. Results

Among 1053 participants, 745 were categorized into epidemic areas and 308 were into non-epidemic areas. Demographic data for each group and descriptive statistics for each variable are shown in Table 2.

**Table 2.** Comparisons of epidemic areas and non-epidemic areas ( $n = 1053$ ).

	Epidemic Areas			Non-Epidemic Areas			Statistics	
	n	Mean	SD	n	Mean	SD	<i>t</i> -Test, U-Test or $\chi^2$	<i>p</i> -Value
Demographics								
Total (Male/Female)	745 (357/388)	-	-	308 (152/156)	-	-	$\chi^2 = 1.850$	0.19
Age		44.88	8.27		44.84	8.284	$t = 0.072$	0.943
Work Status								
Employed/Self-employed	703 (94.4%)	-	-	293 (95.1%)	-	-	$\chi^2 = 1.043$	0.594
Without occupation	33 (4.4%)	-	-	10 (3.2%)	-	-		
House Manager	9 (1.2%)	-	-	5 (1.6%)	-	-		
COVID-19-related Factors								
Self-restraint behavior for COVID-19 prevention	745	5.2	1.531	308	4.91	1.565	$t = 2.774^{**}$	0.006
The degree of motivation for self-restraint behavior	745	22.61	3.73	308	22.56	3.192	$t = 0.206$	0.837
COVID-19-related stigma	745	11.89	2.764	308	12	2.995	$t = -0.59$	0.555
COVID-19-related anxiety	745	14.78	3.785	308	14.35	3.852	$t = 1.665$	0.096
COVID-19-related depressive feeling	745	8.61	2.865	308	8.57	2.934	$t = 0.164$	0.87
Social Anxiety and Depressive Tendency								
MINI-SPIN total	745	4.44	3.391	308	4.94	3.376	$t = -2.174^{*}$	0.03
PHQ-9 total	745	4.7	5.418	308	4.77	5.657	$t = -0.187$	0.852
Psychological Aspects								
TACS-22 total	745	40.73	12.545	308	41.26	12.854	$t = -0.622$	0.534
Avoidance of social roles	745	23.01	5.934	308	22.94	5.664	$t = 0.161$	0.872
Low self-esteem	745	10.53	4.544	308	10.87	4.543	$t = -1.1$	0.272
Complaint	745	7.19	5.054	308	7.45	5.2	$t = -0.746$	0.456
TRS total	745	31.43	10.616	308	30.28	10.888	$t = 1.591$	0.112

Notes. Statistically significant results are shown in bold;  $^{*} = p < 0.05$ ,  $^{**} = p < 0.01$ .

### 3.1. Comparison between Epidemic Areas and Non-Epidemic Areas

We used Student's *t*-test to compare data between epidemic areas and non-epidemic areas. Citizens in epidemic areas showed higher scores on the degree of SRB ( $p = 0.006$ ) and lower scores on MINI-SPIN ( $p = 0.03$ ). Conversely, no significant differences were found on motivation for SRB, depressive tendency (PHQ-9) and COVID-19-related psychological factors such as stigma, anxiety and depressive feelings.

### 3.2. Two-Way ANOVA

A two-way analysis of variance was conducted to examine an interaction between the region of residence and the degree of SRB on the following variables (Table 3). There was a significant interaction on motivation for SRB ( $F(1,1049) = 7.526, p = 0.006$ ). The analysis also showed a significant main effect of SRB ( $F(1,1049) = 39.494, p < 0.001$ ). A post hoc test showed that people reluctant towards SRB in epidemic areas were less motivated than people reluctant towards SRB in non-epidemic areas ( $p < 0.001$ ); however, people with proactive SRB in both areas had stronger motivation for SRB.

**Table 3.** Overview of the results of two-way ANOVA for psychological scales.

	Epidemic Areas (n = 745)				Non-Epidemic Areas (n = 308)				Statistics					
	Proactive (n = 338)		Reluctant (n = 407)		Proactive (n = 120)		Reluctant (n = 188)		Effect of Region		Effect of Self-Restraint Behavior		Interaction	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F(1,1049)	p-Value	F(1,1049)	p-Value	F(1,1049)	p-Value
COVID-19-related Factors														
The degree of motivation for self-restraint behavior	23.78	3.495	21.63	3.639	23.08	3.082	22.23	3.225	0.05	0.823	<b>39.494 **</b>	<b>&lt;0.001</b>	<b>7.526 **</b>	<b>0.006</b>
COVID-19-related stigma	12.93	2.409	11.03	2.746	13.22	2.689	11.23	2.928	1.761	0.185	<b>111.28 **</b>	<b>&lt;0.001</b>	0.054	0.816
COVID-19-related anxiety	15.98	3.608	13.78	3.639	15.98	3.653	13.31	3.614	0.887	0.346	<b>94.801 **</b>	<b>&lt;0.001</b>	0.896	0.344
COVID-19-related depressive feelings	9.14	2.861	8.16	2.794	9.59	3.129	7.93	2.611	0.298	0.585	<b>46.026 **</b>	<b>&lt;0.001</b>	3.096	0.079
Social Anxiety and Depressive tendency														
MINI-SPIN total	4.9	3.536	4.05	3.221	5.79	3.474	4.39	3.203	<b>7.059 **</b>	<b>0.008</b>	<b>23.552 **</b>	<b>&lt;0.001</b>	1.47	0.226
PHQ-9 total	5.52	5.874	4.03	4.913	6.6	6.722	3.61	4.502	0.787	0.375	<b>36.157 **</b>	<b>&lt;0.001</b>	<b>4.061 *</b>	<b>0.044</b>
Psychological Aspects														
TACS-22 total	42.26	12.434	39.45	12.508	44.95	13.652	38.9	11.762	1.538	0.215	<b>26.367 **</b>	<b>&lt;0.001</b>	3.516	0.061
Avoidance of social roles	23.15	5.598	22.88	6.204	23.85	6.124	22.36	5.285	0.048	0.827	<b>4.722 **</b>	<b>0.03</b>	2.29	0.131
Low self-esteem	11.39	4.675	9.82	4.31	12.28	4.197	9.97	4.539	2.852	0.092	<b>39.591 **</b>	<b>&lt;0.001</b>	1.403	0.237
Complaint	7.72	5.149	6.75	4.938	8.83	5.848	6.57	4.542	1.751	0.186	<b>21.426 **</b>	<b>&lt;0.001</b>	3.386	0.066
TRS total	30.67	11.364	32.07	9.922	28.89	10.727	31.16	10.925	<b>3.301</b>	<b>0.07</b>	<b>6.222 *</b>	<b>0.013</b>	0.349	0.555

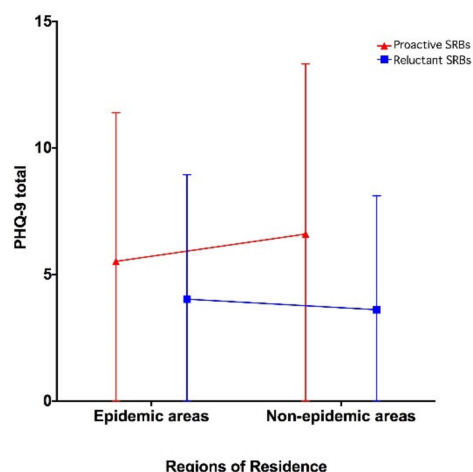
Notes. Statistically significant results are shown in bold; \* =  $p < 0.05$ , \*\* =  $p < 0.01$ .

Regarding mental health status, a  $2 \times 2$  ANOVA showed significant interactions on total scores of PHQ-9 ( $F(1,1049) = 4.061, p = 0.044$ ). In non-epidemic areas, people with proactive SRB had more depressive tendencies than people reluctant towards SRB, whereas people did not differ in epidemic areas. Comparing each condition, those living in non-epidemic areas and engaging in active SRB have the highest depressive tendency (Figure 1).

In addition, the analysis showed the main effects of the degree of SRB on MINI-SPIN ( $F(1,1049) = 23.552, p < 0.001$ ), PHQ-9 ( $F(1,1049) = 36.157, p < 0.001$ ), TACS-22 ( $F(1,1049) = 26.367, p < 0.001$ ) and TRS ( $F(1,1049) = 6.222, p = 0.013$ ). Regardless of where they live, people with proactive SRB differed in terms of having more self-consciousness and avoiding

of public eye, higher depressive tendencies, higher premorbid personality tendency of modern-type depression and lower resilience when compared to people reluctant to SRB.

A  $2 \times 2$  ANOVA also showed a significant main effect of the degree of SRB on COVID-19 related psychological factors. People with proactive SRB tend to have higher COVID-19-related stigma toward others and higher anxious and depressive tendencies due to COVID-19.



**Figure 1.** Total score (mean, SD) of Patient Health Questionnaire-9 (PHQ-9) for all participants ( $n = 1053$ ). PHQ-9 varies with regions of residence (epidemic areas/non-epidemic areas) and proactive/reliant self-restraint behavior (SRB). There is a significant interaction between regions of residence and the degree of SRB ( $F(1,1049) = 4.061, p = 0.044$ ) and a significant main effect of the degree of SRB ( $F(1,1049) = 36.157, p < 0.001$ ). There is a significant difference in PHQ-9 scores between proactive and reluctant SRB in non-epidemic areas in that participants with proactive SRB show higher PHQ-9 total scores than compared to those reluctant toward SRB.

#### 4. Discussion

The present cross-sectional survey among office workers in Japan has showed that people with proactive SRB have stronger COVID-19-related anxiety and depressive feelings, regardless of where they live. This finding supports the previous findings of associations with avoiding danger, anxiety and depression [17,18]. Moreover, we have found that proactive SRB is associated with having stronger COVID-19-related stigma, higher premorbid personality tendencies of modern-type depression (MTD), lower resilience and stronger insecurity about the public, regardless of the epidemic status. Our key finding is that people with proactive SRB in non-epidemic areas have the highest depressive tendency.

MTD is a syndrome of mood disorders especially shown among young people in Japan who hesitate to go to work/school because of depressive feelings and tend to feel better quickly in non-stressful situations [29,31,32]. The majority of patients with MTD are diagnosed with subthreshold of major depressive disorders in DSM-5 [31]. Interestingly, the self-rated questionnaire of TACS-22 has revealed that proactive SRB is positively linked to personality traits of MTD, which includes the avoidance of social roles, complaint tendencies and low self-esteem. Our recent studies have suggested that MTD and pathological social withdrawal (hikikomori) are likely to coexist [33–35] and that MTD may be a gateway condition to hikikomori [36]. Thus, it is concerned that prolonged self-restraint lifestyles due to COVID-19 pandemic may result in the onset of actual depression and hikikomori [21].

Interestingly, the total scores of MINI-SPIN were significantly higher in non-epidemic areas than in epidemic areas, suggesting that people in non-epidemic areas are more likely to avoid attention and public shaming. In this study, epidemic areas consisted of urban areas while the majority of non-epidemic areas were rural. Japan has long been known as a country with a strong sense of shame, particularly in rural areas [21,33]. As a matter of



fact, there is an idiom in Japan called “ *Murahachibu (ostracism)*” which means that if a person performs an unharmonious action in a *Mura* (rural area, village), he/she will be eliminated [21]. In this manner, Japanese society can easily establish a system that excludes disobedience as a social punishment even without legal penalty and such a collective system may be particularly evident in rural areas. This is directly linked to stigma during this time of COVID-19 and there have been reported cases of actual exclusion due to these things and immediate intervention against such stigma is required [25,26]. Osamu Kitayama, who is a Japanese psychoanalyst, stated the negative and positive impacts of shame in the process of SRB among Japanese based on his cultural psychoanalytic perspectives [26]. In August 2020, in order to combat such concerns, the Japanese government (Ministry of Education, Culture, Sports, Science and Technology) has distributed a statement to all nation students and their parents to explain the risk of the COVID-19-related stigma contributing in spreading the disease and the importance of acting toward others with respect [37]. Stigma related problems are not limited to Japan. A recent large-sample study in Canada and United States has revealed significant correlations among health care workers stigmatization, COVID-19 Stress Syndrome, avoiding others, avoiding visits to the drug store or supermarket and avoiding leaving one’s home [38]. In Bangladesh, the first COVID-19-related suicide case has been reported due to fear of COVID-19 and xenophobia [39]. In addition, recent reports have suggested that COVID-19 is a crucial risk factor for the increase in suicide in public [40,41]. Stigma seriously links to suicide [42] and thus suicide prevention strategies should be developed by focusing on reducing stigma against COVID-19.

A recent study in Australia has shown higher psychological distress in patients with depression and bipolar disorder during the COVID-19 pandemic [43]. The present study suggests that not only patients with mood disorders but also wider citizens with depressive tendencies are more likely to refrain from going out in such a pandemic. Ueda et al. has reported the mental health status of the general population using PHQ-9 to assess depressive symptoms and the Seven Item Generalized Anxiety Disorder Scale was used to measure anxiety symptoms during the COVID-19 pandemic in Japan and is based on the online survey that was conducted during May 2020 [44]. Ueda’s survey comprised 2000 respondents who were representative of the Japanese general population in terms of the area of their residency, sex and age distribution. Interestingly, young or middle aged compared to older aged ( $\geq 60$  years) had worse household financial situations compared to the previous year. Being unemployed, laid off, or on leave and being a part-time or temporary worker were associated with higher odds for depression. This report and the present survey have suggested the importance of working situation to prevent mental health problems and further longitudinal studies to clarify the risk factors of depression and other mental health crisis by the COVID-19 pandemic should be conducted.

Interestingly, a recent study in China has reported that psychoneuroimmunity preventions at both personal and organizational levels such as good ventilation in workplaces, wearing a face mask and maintaining hand hygiene were associated with low prevalence of psychiatric symptoms, suggesting that effective psychoneuroimmunity preventions may result in confidence and thus stable mental health state [45]. At the time of survey in this study, the Japanese government and media were emphasizing the importance of psychoneuroimmunity prophylaxes such as hygiene and wearing a face mask. In the present study, quantitative data regarding psychoneuroimmunity prophylaxis were not evaluated. Therefore, further investigations should consider physical environmental factors including psychoneuroimmunity prophylaxis at the organization level and community level in addition to behavioral and psychological factors at the personal level, such as SRB and stigma related to COVID-19.

## 5. Conclusions

The present study has showed that people with proactive SRB have stronger COVID-19-related anxiety and depressive feelings regardless of where they live. Moreover, we

have found that proactive SRB is associated with having stronger COVID-19-related stigma, higher premorbid personality tendencies of modern-type depression (MTD), lower resilience and stronger insecurity with respect to the public regardless of the epidemic status. Our key finding is that people with proactive SRB in non-epidemic areas have the highest depressive tendency.

Based on the present finding, we herein propose the following hypothesis: Higher levels of depressive tendency may enhance proactive SRB, which may be partly associated with higher levels of stigma, anxiety and depressive feelings related to COVID-19. Therefore, providing support to people with depressive tendency can result in abolishing the stigma related to COVID-19. Furthermore, fear of being stigmatized is related to suicide-related behavior [39]; thus, preventing people from stigmatizing or being stigmatized due to COVID-19 is expected to be useful for suicide prevention. Intervention for depressive tendency in public (e.g., non-clinical settings such as workplaces and schools) may also help him/her understand the infectious situation appropriately and to behave effectively during the pandemic.

There are some limitations. First, the participants' general tendency to avoid danger and degree of stigma were not assessed. Next, this is a cross-sectional study in Japan and thus future prospective studies should be conducted to clarify the causal relationship between stigma, SRB and depression tendency and international studies including other countries are warranted to compare data in different sociocultural backgrounds. Finally, most of the participants in this study were office workers and the pandemic is expected to bring about significant changes in their work styles. Therefore, further investigations on the impact of work environment and socioeconomic factors on the mental health of office workers are required in order to improve mental health measures in COVID-19 and unknown infectious situations that may come in the future.

**Author Contributions:** T.A.K. initially designed the study. R.K. participated in study design, conducted statistical analyses and the literature searches and wrote the manuscript. H.K., I.Y. and S.S. participated in study design, oversaw data analysis and interpreted the data. N.S. (Naotaka Shinfuku) and N.S. (Norman Sartorius) participated in data interpretation. T.A.K. oversaw data analysis and participated in data interpretation and the writing of the manuscript. All authors have read and agreed to the published version of the manuscript.

**Funding:** This work was partially supported by the Grant-in-Aid for Scientific Research on (1) Innovative Areas “Will-Dynamics” of The Japan Society for the Promotion of Science (JP16H06403 to T.A.K.), (2) KAKENHI—the Japan Society for the Promotion of Science (JP26713039, JP15K15431, JP16H03741, JP18H04042 and JP19K21591 to T.A.K.; 20H01773 to S.S.), (3) The Japan Agency for Medical Research and Development (AMED) (Syogaisya-Taisaku-Sogo-Kenkyu-Kaihatsu-Jigyō (JP17dk0307047, JP19dk0307073 and JP18dk0307075 to T.A.K.) and (4) SENSHIN Medical Research Foundation (to T.A.K.). The funders had no role in study design, data collection and analysis, in the decision to publish or the preparation of the manuscript.

**Institutional Review Board Statement:** This study was performed in accordance with the Declaration of Helsinki and was approved by the ethics committees of Nihon University and Kyushu University, Japan. We conducted a cross-sectional study by using an online survey company (Cross Marketing Inc., Tokyo, Japan). Participants agreed to join the study after being informed that their anonymity would be maintained and that participation was voluntary.

**Informed Consent Statement:** This study was performed in accordance with the Declaration of Helsinki and was approved by the ethics committees of Nihon University and Kyushu University, Japan. We conducted a cross-sectional study by using an online survey company (Cross Marketing Inc., Tokyo, Japan). Participants agreed to join the study after being informed that their anonymity would be maintained and that participation was voluntary.

**Data Availability Statement:** The datasets generated and/or analyzed during the current study are not publicly available due to their use in further research but are available from the corresponding author upon reasonable request.



**Acknowledgments:** This study was partially conducted as a task force of The Urban Mental Health Section, World Psychiatric Association (WPA).

**Conflicts of Interest:** All the authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Abbreviations

COVID-19: Coronavirus disease 2019; SRB: Self-restraint behavior; PHQ-9: the nine-item Patient Health Questionnaire; MINI-SPIN: MINI-Social Phobia Inventory; SAD: social anxiety disorder; TACS-22: the 22-item Tarumi's Modern-Type Depression Trait Scale; TRS: Tachikawa resilience scale; ANOVA: Analysis of variance; MTD: Modern-type depression; WPA: World Psychiatric Association; SD: Standard deviation.

### References

1. Hellewell, J.; Abbott, S.; Gimma, A.; Bosse, N.I.; Jarvis, C.I.; Russell, T.W.; Munday, J.D.; Kucharski, A.J.; Edmunds, W.J. Centre for the Mathematical Modelling of Infectious Diseases C-WG et al.: Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts. *Lancet Glob. Health* **2020**, *8*, e488–e496. [\[CrossRef\]](#)
2. Xiang, M.; Yamamoto, S.; Mizoue, T. Depressive symptoms in students during school closure due to COVID-19 in Shanghai. *Psychiatry Clin. Neurosci.* **2020**, *74*, 664–666. [\[CrossRef\]](#) [\[PubMed\]](#)
3. Pattojoshi, A.; Sidana, A.; Garg, S.; Mishra, S.N.; Singh, L.K.; Goyal, N.; Tikka, S.K. Staying home is NOT 'staying safe': A rapid 8-day online survey on spousal violence against women during the COVID-19 lockdown in India. *Psychiatry Clin. Neurosci.* **2020**. [\[CrossRef\]](#)
4. Torricelli, L.; Poletti, M.; Raballo, A. Managing COVID-19-related psychological distress in health workers: Field experience in northern Italy. *Psychiatry Clin. Neurosci.* **2021**, *75*, 23–24. [\[CrossRef\]](#) [\[PubMed\]](#)
5. Mallik, C.I.; Radwan, R.B. Impact of lockdown due to COVID-19 pandemic in changes of prevalence of predictive psychiatric disorders among children and adolescents in Bangladesh. *Asian J. Psychiatry* **2021**, *56*, 102554. [\[CrossRef\]](#)
6. Mackolil, J.; Mackolil, J. Addressing psychosocial problems associated with the COVID-19 lockdown. *Asian J. Psychiatry* **2020**, *51*, 102156. [\[CrossRef\]](#) [\[PubMed\]](#)
7. Stavridou, A.; Stergiopoulou, A.A.; Panagouli, E.; Mesiris, G.; Thirios, A.; Mougiakos, T.; Troupis, T.; Psaltopoulou, T.; Tsolia, M.; Sergeantanis, T.N.; et al. Psychosocial consequences of COVID-19 in children, adolescents and young adults: A systematic review. *Psychiatry Clin. Neurosci.* **2020**, *74*, 615–616. [\[CrossRef\]](#) [\[PubMed\]](#)
8. Pignon, B.; Gourevitch, R.; Tebeka, S.; Dubertret, C.; Cardot, H.; Dauriac-Le Masson, V.; Trebalag, A.K.; Barruel, D.; Yon, L.; Hemery, F.; et al. Dramatic reduction of psychiatric emergency consultations during lockdown linked to COVID-19 in Paris and suburbs. *Psychiatry Clin. Neurosci.* **2020**, *74*, 557–559. [\[CrossRef\]](#)
9. Muhidin, S.; Vizheh, M.; Moghadam, Z.B. Anticipating COVID-19-related stigma in survivors and health-care workers: Lessons from previous infectious diseases outbreaks-An integrative literature review. *Psychiatry Clin. Neurosci.* **2020**, *74*, 617–618. [\[CrossRef\]](#)
10. Kuki, K.; Yamaguchi, Y.; Makinodan, M.; Honda, M.; Ueda, J.; Okazaki, K.; Okamura, K.; Kimoto, S.; Kishimoto, T. Effects of contacting with COVID-19 patients on the mental health of workers in a psychiatric hospital. *Psychiatry Clin. Neurosci.* **2020**, *75*, 67–69. [\[CrossRef\]](#) [\[PubMed\]](#)
11. Do Duy, C.; Nong, V.M.; Van, A.N.; Thu, T.D.; Do Thu, N.; Quang, T.N. COVID-19 related stigma and its association with mental health of health-care workers after quarantined in Vietnam. *Psychiatry Clin. Neurosci.* **2020**, *74*, 566–568. [\[CrossRef\]](#) [\[PubMed\]](#)
12. Sun, Y.; Bao, Y.; Lu, L. Addressing mental health care for the bereaved during the COVID-19 pandemic. *Psychiatry Clin. Neurosci.* **2020**, *74*, 406–407. [\[CrossRef\]](#)
13. Shigemura, J.; Ursano, R.J.; Morganstein, J.C.; Kurosawa, M.; Benedek, D.M. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin. Neurosci.* **2020**, *74*, 281–282. [\[CrossRef\]](#) [\[PubMed\]](#)
14. Cheung, D.; Ip, E.C. COVID-19 Lockdowns: A Public Mental Health Ethics Perspective. *Asian Bioeth. Rev.* **2020**, *12*, 503–510. [\[CrossRef\]](#)
15. Diamond, R.; Byrd, E. Standing up for health-improving mental wellbeing during COVID-19 isolation by reducing sedentary behaviour. *J. Affect. Disord.* **2020**, *277*, 232–234. [\[CrossRef\]](#)
16. Katafuchi, Y.; Kurita, K.; Managi, S. COVID-19 with Stigma: Theory and Evidence from Mobility Data. *Econ. Disasters Clim. Chang.* **2020**, *5*, 71–95. [\[CrossRef\]](#)
17. Cloninger, C.R.; Svrakic, D.M.; Przybeck, T.R. Can personality assessment predict future depression? A twelve-month follow-up of 631 subjects. *J. Affect. Disord.* **2006**, *92*, 35–44. [\[CrossRef\]](#) [\[PubMed\]](#)
18. Shirahama, M.; Terao, T.; Ishii, N.; Hatano, K.; Hirakawa, H.; Kohno, K. Relationship between anxious temperament and harm avoidance in medical students and staff. *Psychiatry Clin. Neurosci.* **2018**, *72*, 322–328. [\[CrossRef\]](#) [\[PubMed\]](#)
19. Qian, K.; Yahara, T. Mentality and behavior in COVID-19 emergency status in Japan: Influence of personality, morality and ideology. *PLoS ONE* **2020**, *15*, e0235883.

20. Muto, K.; Yamamoto, I.; Nagasu, M.; Tanaka, M.; Wada, K. Japanese citizens' behavioral changes and preparedness against COVID-19: An online survey during the early phase of the pandemic. *PLoS ONE* **2020**, *15*, e0234292.
21. Kato, T.A.; Sartorius, N.; Shinfuku, N. Forced social isolation due to COVID-19 and consequent mental health problems: Lessons from hikikomori. *Psychiatry Clin. Neurosci.* **2020**, *74*, 506–507. [[CrossRef](#)] [[PubMed](#)]
22. Fischer, L.S.; Mansergh, G.; Lynch, J. Santibanez S: Addressing Disease-Related Stigma During Infectious Disease Outbreaks. *Disaster Med. Public Health Prep.* **2019**, *13*, 989–994. [[CrossRef](#)]
23. Person, B.; Sy, F.; Holton, K.; Govert, B.; Liang, A. Fear and stigma: The epidemic within the SARS outbreak. *Emerg. Infect. Dis.* **2004**, *10*, 358–363. [[CrossRef](#)] [[PubMed](#)]
24. Logie, C.H. Lessons learned from HIV can inform our approach to COVID-19 stigma. *J. Int.* **2020**, *23*, e25504. [[CrossRef](#)]
25. Yamauchi, M. Naze Umareta “Jishuku Keisatsu” “Labeling” No Hitori Aruki, Massmedia Mo Katan? *The Mainichi Newspapers*. 2020. Available online: <https://mainichi.jp/articles/20200818/k00/00m/040/229000c> (accessed on 1 July 2021).
26. Yoshida, M. Nihon-jin No Shinwateki-Shikou ga Kinou Seishin-Bunseki-i ga Yomitoku Korona. *The Asahi Shimbun*. 2020. Available online: <https://www.asahi.com/articles/ASN5T3J9LN5RUCFI001.html> (accessed on 1 July 2021).
27. Muramatsu, K.; Miyaoka, H.; Kamijima, K.; Muramatsu, Y.; Tanaka, Y.; Hosaka, M.; Miwa, Y.; Fuse, K.; Yoshimine, F.; Mashima, I.; et al. Performance of the Japanese version of the Patient Health Questionnaire-9 (J-PHQ-9) for depression in primary care. *Gen. Hosp. Psychiatry* **2018**, *52*, 64–69. [[CrossRef](#)] [[PubMed](#)]
28. Connor, K.M.; Kobak, K.A.; Churchill, L.E.; Katzelnick, D.; Davidson, J.R. Mini-SPIN: A brief screening assessment for generalized social anxiety disorder. *Depress. Anxiety* **2001**, *14*, 137–140. [[CrossRef](#)]
29. Kato, T.A.; Katsuki, R.; Kubo, H.; Shimokawa, N.; Sato-Kasai, M.; Hayakawa, K.; Kuwano, N.; Umene-Nakano, W.; Tatenno, M.; Setoyama, D.; et al. Development and validation of the 22-item Tarumi's Modern-Type Depression Trait Scale: Avoidance of Social Roles, Complaint, and Low Self-Esteem (TACS-22). *Psychiatry Clin. Neurosci.* **2019**, *73*, 448–457.
30. Nishi, D.; Uehara, R.; Yoshikawa, E.; Sato, G.; Ito, M.; Matsuoka, Y. Culturally sensitive and universal measure of resilience for Japanese populations: Tachikawa Resilience Scale in comparison with Resilience Scale 14-item version. *Psychiatry Clin. Neurosci.* **2013**, *67*, 174–181.
31. Kato, T.A.; Hashimoto, R.; Hayakawa, K.; Kubo, H.; Watabe, M.; Teo, A.R.; Kanba, S. Multidimensional anatomy of 'modern type depression' in Japan: A proposal for a different diagnostic approach to depression beyond the DSM-5. *Psychiatry Clin. Neurosci.* **2016**, *70*, 7–23. [[CrossRef](#)]
32. Kato, T.A.; Shinfuku, N.; Fujisawa, D.; Tatenno, M.; Ishida, T.; Akiyama, T.; Sartorius, N.; Teo, A.R.; Choi, T.Y.; Wand, A.P.; et al. Introducing the concept of modern depression in Japan; an international case vignette survey. *J. Affect. Disord.* **2011**, *135*, 66–76. [[CrossRef](#)] [[PubMed](#)]
33. Kato, T.A.; Kanba, S.; Teo, A.R. Hikikomori: Multidimensional understanding, assessment, and future international perspectives. *Psychiatry Clin. Neurosci.* **2019**, *73*, 427–440. [[CrossRef](#)] [[PubMed](#)]
34. Teo, A.R.; Nelson, S.; Strange, W.; Kubo, H.; Katsuki, R.; Kurahara, K.; Kanba, S.; Kato, T.A. Social withdrawal in major depressive disorder: A case-control study of hikikomori in Japan. *J. Affect. Disord.* **2020**, *274*, 1142–1146. [[CrossRef](#)] [[PubMed](#)]
35. Katsuki, R.; Tatenno, M.; Kubo, H.; Kurahara, K.; Hayakawa, K.; Kuwano, N.; Kanba, S.; Kato, T.A. Autism spectrum conditions in hikikomori: A pilot case-control study. *Psychiatry Clin. Neurosci.* **2020**, *74*, 652–658. [[CrossRef](#)] [[PubMed](#)]
36. Kato, T.A.; Kanba, S. Modern-Type Depression as an “Adjustment” Disorder in Japan: The Intersection of Collectivistic Society Encountering an Individualistic Performance-Based System. *Am. J. Psychiatry* **2017**, *174*, 1051–1053. [[CrossRef](#)] [[PubMed](#)]
37. Hagiuda, K. *Preventing Discrimination and Prejudice Related to Novel Coronavirus Infections*; Japan Ministry of Education, Culture, Sports, Science and Technology: Tokyo, Japan, 2020.
38. Taylor, S.; Landry, C.A.; Rachor, G.S.; Paluszek, M.M.; Asmundson, G.J.G. Fear and avoidance of healthcare workers: An important, under-recognized form of stigmatization during the COVID-19 pandemic. *J. Anxiety Disord.* **2020**, *75*, 102289. [[CrossRef](#)]
39. Mamun, M.A.; Griffiths, M.D. First COVID-19 suicide case in Bangladesh due to fear of COVID-19 and xenophobia: Possible suicide prevention strategies. *Asian J. Psychiatry* **2020**, *51*, 102073. [[CrossRef](#)]
40. Kahil, K.; Cheaito, M.A.; El Hayek, R.; Nofal, M.; El Halabi, S.; Kudva, K.G.; Pereira-Sanchez, V.; El Hayek, S. Suicide during COVID-19 and other major international respiratory outbreaks: A systematic review. *Asian J. Psychiatry* **2020**, *56*, 102509. [[CrossRef](#)]
41. Panigrahi, M.; Pattnaik, J.I.; Padhy, S.K.; Menon, V.; Patra, S.; Rina, K.; Padhy, S.S.; Patro, B. COVID-19 and suicides in India: A pilot study of reports in the media and scientific literature. *Asian J. Psychiatry* **2021**, *57*, 102560. [[CrossRef](#)]
42. Sudak, H.; Maxim, K.; Carpenter, M. Suicide and stigma: A review of the literature and personal reflections. *Acad. Psychiatry* **2008**, *32*, 136–142. [[CrossRef](#)]
43. Van Rheenen, T.E.; Meyer, D.; Neill, E.; Phillipou, A.; Tan, E.J.; Toh, W.L.; Rossell, S.L. Mental health status of individuals with a mood-disorder during the COVID-19 pandemic in Australia: Initial results from the COLLATE project. *J. Affect. Disord.* **2020**, *275*, 69–77. [[CrossRef](#)] [[PubMed](#)]
44. Ueda, M.; Stickley, A.; Sueki, H.; Matsubayashi, T. Mental health status of the general population in Japan during the COVID-19 pandemic. *Psychiatry Clin. Neurosci.* **2020**, *74*, 505–506. [[CrossRef](#)] [[PubMed](#)]
45. Tan, W.; Hao, F.; McIntyre, R.S.; Jiang, L.; Jiang, X.; Zhang, L.; Zhao, X.; Zou, Y.; Hu, Y.; Luo, X.; et al. Is returning to work during the COVID-19 pandemic stressful? A study on immediate mental health status and psychoneuroimmunity prevention measures of Chinese workforce. *Brain Behav. Immun.* **2020**, *87*, 84–92. [[CrossRef](#)] [[PubMed](#)]