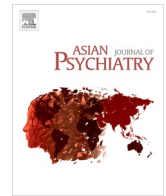




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



## Burnout, depression, anxiety, and insomnia of internists and primary care physicians during the COVID-19 pandemic in Japan: A cross-sectional survey

### ARTICLE INFO

#### Keywords

Burnout, professional  
Anxiety  
Depression  
Sleep initiation and maintenance disorders  
Resilience, psychological  
COVID-19

### 1. Introduction

In Japan, the first COVID-19 case was reported on January 16, 2020; the country has experienced five waves of infection surge as of November 2021 (Supplementary Figure).

Internists and primary care physicians play a central role in the diagnosis and treatment of COVID-19 as frontline healthcare workers. In Japan, internists and primary care physicians account for approximately 40% of all physicians. In this cross-sectional study, we investigated the prevalence of burnout, depression, anxiety, and insomnia in Japanese internists and primary care physicians in March 2021.

### 2. Materials and methods

#### 2.1. Study Design

We conducted a cross-sectional, web-based, anonymous survey of physician members of the American College of Physicians Japan Chapter (ACP-JC). The ACP-JC is composed of internists and primary care physicians, including fellows, residents, and medical students. We sent an invitation to the physician members on March 2, 2021, via email listservs of the ACP-JC, which included a link to the survey on Google Forms. We sent three reminder emails, the last of which was sent on March 16, when we closed the survey. The participants did not receive any incentives. This study was approved by the institutional review board of Kurashiki Central Hospital.

#### 2.2. Questionnaire design

The variables for the questionnaire were selected based on a literature review and discussion within the study group, who included internists, primary care physicians, psychiatrists, a critical care physician, and a resident (Supplementary File). The components included were as follows: (1) personal information; (2) exposure to COVID-19; (3) impact of the pandemic on professional and personal aspects; (4) turnover intention; and (5) six scales, namely, Mini Z 2.0 Survey (Nagasaki et al.,

2021), Patient Health Questionnaire-9 (PHQ-9) (Muramatsu et al., 2018), Generalized Anxiety Disorder-7 (GAD-7) (Muramatsu et al., 2009), Athens Insomnia Scale-Japanese version (AIS-J) (Okajima et al., 2013), Brief Resilience Scale-Japanese version (BRS-J) (Tokuyoshi and Moriya, 2015), and Utrecht Work Engagement Scale (UWES-3) (Schaufeli et al., 2017).

We evaluated turnover intention using the following statement: "Are you currently thinking of leaving your job responsibilities?" We asked the respondents to choose one of the following responses: Yes (I have the plan to do so), Yes (I am vaguely thinking about it), No, or Uncertain. Either of the two former responses of "Yes" indicated turnover intention in this study.

The Mini Z 2.0 Survey is a simple tool that can measure burnout and workplace conditions among physicians. We defined the presence of burnout as a score of  $\geq 3$  on this item. The PHQ-9 is a widely-used screening instrument for major depression. We considered a score  $\geq 10$  to indicate the presence of depression. For generalized anxiety disorder, we used the GAD-7, a validated screening instrument and self-assessment questionnaire. Anxiety was indicated by the cutoff value of  $\geq 10$ . The AIS-J is a Japanese version of the Athens Insomnia Scale, a self-assessment instrument for quantifying sleep difficulty based on ICD-10 criteria. We defined "pathological insomnia" as a score  $\geq 10$ . The BRS-J is a Japanese version of the Brief Resilience Scale, a self-rated tool for assessing an individual's ability to recover or bounce back from stress. We also used the UWES-3 for assessing vigor, dedication, and absorption, with each item rated on a seven-point scale.

#### 2.3. Outcome measures

The primary outcome was the prevalence of burnout. The secondary outcomes were the prevalence of depression, anxiety, insomnia, and turnover intention.

#### 2.4. Statistical analysis

We generated descriptive statistics for the respondents'

<https://doi.org/10.1016/j.ajp.2021.102956>

Received 21 October 2021; Received in revised form 23 November 2021; Accepted 28 November 2021

Available online 2 December 2021

1876-2018/© 2021 Elsevier B.V. All rights reserved.

characteristics. To examine the risk factors for burnout, we conducted multivariable logistic regression analysis. The final model was adjusted for sex, career duration ( $\leq 25$  or  $\geq 26$  years), marital status (having a partner or not), direct involvement with COVID-19 patients, shortage of personal protective equipment (PPE), and self-quarantine (Ng et al., 2020; Rossi et al., 2020; Song et al., 2020; Wadoo et al., 2021), all of which are known risk factors for burnout, anxiety, and insomnia. We further computed the pairwise Pearson's correlation coefficient and coefficient of variation ( $R^2$ ) between the burnout score and work engagement subscales and resilience, respectively. There were no missing data for each item collected. We used Stata version 17.0 (StataCorp, College Station, TX, USA) for analysis. P-values of  $< 0.05$  were considered statistically significant.

### 3. Results

Among the 1173 ACP-JC physicians, 214 (18.2%) completed the survey. Table 1 provides the demographic details and other characteristics of the respondents.

Symptoms of burnout were found in 68 respondents (31.8%; 95% confidence interval [CI]: 25.6–38.4). Sixty-one (28.5%) reported that their level of burnout had worsened compared with December 2019, when the first wave of the COVID-19 pandemic had not yet occurred. Multivariable logistic regression analysis suggested that burnout was associated with having no partner (odds ratio [OR]: 2.41; 95% CI: 1.00–5.77) and shortage of PPE (OR: 2.84; 95% CI: 1.09–7.44) (Table 2). Pairwise Pearson correlation coefficients and unadjusted beta coefficients consistently suggested that higher scores on the engagement subscales and resilience were weakly but significantly correlated with decreased scores for burnout (Table 3).

Symptoms of anxiety, depression, and insomnia were reported by 74 (34.6%; 95% CI: 28.2–41.3), 33 (15.4%; 95% CI: 10.9–21.0), and 78

**Table 1**  
Characteristics of the participants.

Variables	
Sample size	214
Age, median (IQR)	54 (44–59)
Female, n (%)	24 (11.2%)
Career duration (years), n (%)	
1–5	13 (6.0%)
6–15	31 (14.5%)
16–25	47 (22.0%)
26–35	74 (34.6%)
$\geq 36$	49 (22.9%)
Marital status, n (%)	
Married	180 (84.2%)
Divorced	5 (2.3%)
Single with a partner	6 (2.8%)
Single without a partner	21 (9.8%)
Widowed	2 (0.9%)
Total number of COVID-19 patients managed, n (%)	
0	65 (30.4%)
1–30	124 (57.9%)
31–60	11 (5.2%)
$\geq 61$	14 (6.5%)
PPE shortage, n (%)	20 (9.4%)
Reduction of patients and/or salary	42 (19.6%)
Stigmatization, n (%)	19 (8.9%)
For being clinicians	8 (3.7%)
For workplaces being involved in the care of COVID-19 patients	12 (5.6%)
Self-quarantine, n (%)	27 (12.6%)
Perceived risk of infection	56 (26.2%)
Brief Resilience Scale score, mean (SD)	20.5 (5.4)
Utrecht Work Engagement Scale, mean (SD)	
Vigor	3.3 (1.4)
Dedication	4.1 (1.3)
Absorption	3.3 (1.5)

Abbreviation; IQR, interquartile range; COVID-19, coronavirus disease 2019; SD, standard deviation.

(36.5%; 95% CI: 30.0–43.3) respondents, respectively. Multivariable logistic regression analysis suggested that anxiety was associated with having no partner (OR: 3.18; 95% CI: 1.30–7.76), stigma (OR: 2.83; 95% CI: 1.04–7.69), and experience of self-quarantine (OR: 2.62; 95% CI: 1.11–6.18). Insomnia was only associated with having no partner (OR: 2.49; 95% CI: 1.03–6.02) (Table 2).

Eighty-seven respondents (40.7%; 95% CI: 34.0–47.5) had turnover intentions. An exploratory, multivariable logistic regression analysis revealed that only a higher resilience score was associated with a reduced risk of turnover intention (OR: 0.91; 95% CI: 0.86–0.96) (Table 4).

### 4. Discussion

Our results showed that over 30% of the Japanese internists and primary care physicians had symptoms of burnout, anxiety, and insomnia, whereas approximately 15% of them were depressed. Nearly 40% of the participants considered leaving their job or changing professions. Having no partner was consistently associated with the risk of burnout, anxiety, and insomnia.

Our findings revealed consistency with the reported prevalence of burnout (34.4%; 95% CI: 28.8%–53.5%), anxiety (31.9%; 95% CI: 27.9%–36.0%) and insomnia (37.9%; 95% CI: 29.9%–46.2%) among healthcare workers worldwide during the COVID-19 pandemic (Salazar de Pablo et al., 2020; Wu et al., 2021). In contrast, the prevalence of depression in our study (approximately 15%) was lower than that among healthcare workers worldwide in previous reports (31.4%; 95% CI: 27.3–35.5%) (Wu et al., 2021).

The evidence is conflicting regarding whether marital status or having a partner is associated with these mental disorders. Previous studies have suggested that both being married and unmarried/divorced are associated with these disorders during the pandemic (Song et al., 2020). Having a partner could be protective against stress because partners can share mental burdens through communication and emotional support. Partners could also place burdens on each other that those without partners do not bear. Moreover, the fear of infecting one's partner could also be a stressor. In our study, having no partner was consistently associated with the risk of burnout, depression, and insomnia. Further studies on the mental burden of physicians without partners, as well as studies that examine other potential risk factors, are needed in the Japanese context during the pandemic.

Our results also suggested that high work engagement and resilience levels were weakly associated with lower levels of burnout. The UWES-3 measures work engagement in three dimensions: vigor, dedication, and absorption. Vigor is defined as "high levels of energy and mental resilience while working, the willingness to invest in one's work and persistence even in the face of difficulty." Although small, vigor accounted for the greatest part of burnout among these three dimensions ( $R^2 = 0.11$ ). In contrast, resilience is described as a dynamic process encompassing positive adaptation within the context of adversity and is reported to be protective against the incidence of mental health disorders. In our study, resilience was responsible for a similar proportion of burnout ( $R^2 = 0.14$ ). Theoretically, there should be more to burnout than work engagement and resilience, which we failed to find in this study.

Our study suggested that 40.7% of the respondents considered changing or leaving their professional positions. Recent studies have suggested a number of factors associated with turnover intentions in the pandemic, including older age, perceptions of discrimination and threat, financial situation, and resilience (Zhang et al., 2020). Our exploratory analysis suggested that resilience was protective against turnover intention. Training resilience in physicians would be necessary to avoid turnover during the ongoing pandemic.

Our study has several limitations. First, our survey had a low response rate, potentially leading to non-responder bias. However, recent evidence suggests that response rates might be poorly associated

**Table 2**  
Multivariate logistic regression analyses of risk factors for burnout, anxiety, and insomnia.

	Burnout		Anxiety		Insomnia	
	Odds ratio (95% CI)	P-value	Odds ratio (95% CI)	P-value	Odds ratio (95% CI)	P-value
Female	1.30 (0.50–3.36)	0.59	0.66 (0.24–1.80)	0.41	0.40 (0.14–1.16)	0.090
Career duration ≥ 26 years	1.13 (0.62–2.09)	0.68	1.14 (0.62–2.08)	0.67	1.24 (0.70–2.21)	0.47
Without a partner	2.41 (1.00–5.77)	0.049	3.18 (1.30–7.76)	0.011	2.49 (1.03–6.02)	0.042
Direct involvement of COVID-19 patients	0.90 (0.47–1.74)	0.76	1.06 (0.55–2.05)	0.85	1.02 (0.55–1.91)	0.94
Shortage of PPE	2.84 (1.09–7.44)	0.033	1.82 (0.68–4.88)	0.23	1.14 (0.43–3.01)	0.80
Stigma	1.48 (0.54–4.05)	0.44	2.83 (1.04–7.69)	0.041	0.79 (0.28–2.23)	0.66
Self-quarantine	1.92 (0.81–4.54)	0.138	2.62 (1.11–6.18)	0.027	1.44 (0.62–3.33)	0.40

Abbreviations; CI, confidence interval; COVID-19, coronavirus disease 2019; PPE, personal protective equipment.

**Table 3**  
Pearson’s correlation coefficients and coefficients of variance between work engagement, resilience, and burnout.

	r	Beta coefficient (95% confidence interval)	R <sup>2</sup>	T	P-value
Work engagement subscale					
Vigor	-0.34	-0.18 (-0.25 to -0.11)	0.11	-5.23	< 0.001
Dedication	-0.26	-0.13 (-0.20 to -0.05)	0.05	-3.37	0.001
Absorption	-0.16	-0.08 (-0.14 to -0.01)	0.02	-2.34	0.020
Resilience	-0.37	-0.05 (-0.07 to -0.03)	0.14	-5.83	< 0.001

**Table 4**  
Multivariable logistic regression analysis of risk factors for turnover intention.

	Odds ratio (95% Confidence Interval)	P-value
Age ≥ 50	0.93 (0.51–1.67)	0.81
Perceived risk of infection	1.37 (0.71–2.64)	0.34
Reduction in patients and/or salary	1.12 (0.54–2.33)	0.76
Stigma	1.60 (0.56–4.55)	0.44
Resilience score	0.91 (0.86–0.96)	< 0.001

with non-responder bias (Hendra and Hill, 2019). Thus, the low response rate may not have impacted the relevance of our study. Second, we did not evaluate the organizational- and society-level contexts as risk factors for mental health disorders. Third, this cross-sectional study does not necessarily suggest that the COVID-19 pandemic was responsible for the psychological burden. However, approximately 30% of the respondents reported an exacerbation of burnout level compared with the time prior to the COVID-19 pandemic—it is likely that the COVID-19 had some impact on the mental health of the participants. Fourth, this study was conducted before the COVID-19 vaccine distribution in Japan. Availability of the vaccines as well as their impact on the pandemic may have changed the prevalence of mental health disorders among healthcare workers. Thus, further studies on prevalence are warranted. Despite these limitations, our participants included respondents from 40 out of the 47 prefectures in Japan. To the best of our knowledge, our study is the first to show the prevalence of mental health disorders among internists and primary care physicians across Japan.

In addition to causing physical complications, the COVID-19 pandemic has also placed a burden on the mental health of the general population that may persist after the pandemic (Asmundson and Taylor, 2020). However, society at large has not attended to mental health during the pandemic, and there has been a lack of accurate information and public health messages that focus on this issue (Tandon, 2021a, 2021b). The COVID-19 pandemic has further exposed an

important issue, that is, healthcare workers in general are also vulnerable to this disease and can suffer from mental health disorders. However, healthcare workers worldwide have difficulty in accessing psychiatric care (Capraz et al., 2020; Grover et al., 2020; Ng et al., 2020; Oladunjoye and Oladunjoye, 2020; Wadoo et al., 2021). Some interventions aimed at mitigating the mental burden of healthcare workers have thus been developed (Capraz et al., 2020). While the long-term mental outcomes of the COVID-19 pandemic remain to be elucidated, our study underscores the urgent need for psychological support for healthcare workers.

## 5. Conclusions

Approximately 30% of the Japanese internists and primary care physicians who participated in our study had symptoms of burnout, anxiety, and insomnia, whereas 15% were depressed during the COVID-19 pandemic. Interventions to help mitigate mental health disorders in internists and primary care physicians are needed.

## Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Acknowledgments

The authors would like to sincerely thank the participants who responded to the survey.

## Conflicts of interest

The authors have no conflicts of interest to declare.

## Financial Disclosure

The authors have no financial disclosure.

## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.ajp.2021.102956](https://doi.org/10.1016/j.ajp.2021.102956).

## References

- Asmundson, G.J.G., Taylor, S., 2020. Coronaphobia: fear and the 2019-nCoV outbreak. *J. Anxiety Disord.* 70, 102196.
- Capraz, N., Erim, B.R., Kucukparlak, I., Sercan, M., 2020. A specific mental health intervention for healthcare workers in Turkey. *Asian J. Psychiatry* 54, 102315.
- Grover, S., Dua, D., Sahoo, S., Mehra, A., Nehra, R., Chakrabarti, S., 2020. Why all COVID-19 hospitals should have mental health professionals: The importance of mental health in a worldwide crisis! *Asian J. Psychiatry* 51, 102147.
- Hendra, R., Hill, A., 2019. Rethinking response rates: new evidence of little relationship between survey response rates and nonresponse bias. *Eval. Rev.* 43, 307–330.

- Muramatsu, K., Muramatsu, Y., Miyaoka, H., Fuse, K., Yoshimine, F., Hosaka, M., Katagiri, A., Kutsumi, R., 2009. Validation and utility of a Japanese version of the GAD-7, PANMINERVA MEDICA 20th World Congress on Psychosomatic Medicine Abstracts Book.
- Muramatsu, K., Miyaoka, H., Kamijima, K., Muramatsu, Y., Tanaka, Y., Hosaka, M., Miwa, Y., Fuse, K., Yoshimine, F., Mashima, I., Shimizu, N., Ito, H., Shimizu, E., 2018. Performance of the Japanese version of the patient health questionnaire-9 (J-PHQ-9) for depression in primary care. *Gen. Hosp. Psychiatry* 52, 64–69.
- Nagasaki, K., Shikino, K., Nishimura, Y., Kuriyama, A., Nonaka, S., Izumiya, M., Makiishi, T., 2021. Translation, cultural adaptation, and validation of the mini-Z 2.0 survey among Japanese physicians and residents. *Intern. Med.* 60, 2405–2411.
- Ng, Q.X., De Deyn, M., Lim, D.Y., Chan, H.W., Yeo, W.S., 2020. The wounded healer: a narrative review of the mental health effects of the COVID-19 pandemic on healthcare workers. *Asian J. Psychiatry* 54, 102258.
- Okajima, I., Nakajima, S., Kobayashi, M., Inoue, Y., 2013. Development and validation of the Japanese version of the Athens insomnia scale. *Psychiatry Clin. Neurosci.* 67, 420–425.
- Oladunjoye, A., Oladunjoye, O., 2020. An evolving problem-mental health symptoms among health care workers during COVID-19 pandemic. *Asian J. Psychiatry* 54, 102257.
- Rossi, R., Soggi, V., Pacitti, F., Di Lorenzo, G., Di Marco, A., Siracusano, A., Rossi, A., 2020. Mental health outcomes among frontline and second-line health care workers during the coronavirus disease 2019 (COVID-19) pandemic in Italy. *JAMA Netw. Open* 3, e2010185.
- Salazar de Pablo, G., Vaquerizo-Serrano, J., Catalan, A., Arango, C., Moreno, C., Ferre, F., Shin, J.I., Sullivan, S., Brondino, N., Solmi, M., Fusar-Poli, P., 2020. Impact of coronavirus syndromes on physical and mental health of health care workers: systematic review and meta-analysis. *J. Affect. Disord.* 275, 48–57.
- Schaufeli, W.B., Shimazu, A., Hakkanen, J., Salanova, M., De Witte, H., 2017. An ultra-short measure for work engagement. *Eur. J. Psychol. Assess.*
- Song, X., Fu, W., Liu, X., Luo, Z., Wang, R., Zhou, N., Yan, S., Lv, C., 2020. Mental health status of medical staff in emergency departments during the Coronavirus disease 2019 epidemic in China. *Brain Behav. Immun.* 88, 60–65.
- Tandon, R., 2021a. The bitter lessons of COVID-19: acknowledging and working through many points of tension. *Asian J. Psychiatry* 55, 102545.
- Tandon, R., 2021b. COVID-19 and suicide: just the facts. Key learnings and guidance for action. *Asian J. Psychiatry* 60, 102695.
- Tokuyoshi, Y., Moriya, M., 2015. Development and validation of the brief resilience scale Japanese version (BRS-J). *Proc. Annu. Conv. Jpn. Psychol. Assoc.* 79, 055.
- Wadoo, O., Latoo, J., Iqbal, Y., Chandrappa, N.S.K., Chandra, P., Masoodi, N.A., Al-Maslmani, M., Alabdulla, M., 2021. Mental wellbeing of frontline healthcare workers during COVID-19 pandemic in Qatar. *Asian J. Psychiatry* 55, 102517.
- Wu, T., Jia, X., Shi, H., Niu, J., Yin, X., Xie, J., Wang, X., 2021. Prevalence of mental health problems during the COVID-19 pandemic: a systematic review and meta-analysis. *J. Affect. Disord.* 281, 91–98.
- Zhang, X., Bian, L., Bai, X., Kong, D., Liu, L., Chen, Q., Li, N., 2020. The influence of job satisfaction, resilience and work engagement on turnover intention among village doctors in China: a cross-sectional study. *BMC Health Serv. Res.* 20, 283.
- Akira Kuriyama\*  
Emergency and Critical Care Center, Kurashiki Central Hospital, Okayama, Japan
- Kiyoshi Shikino  
Department of General Medicine, Chiba University Hospital, Chiba, Japan
- Mitsuru Moriya  
Department of Psychosomatic Internal Medicine, Health Sciences University of Hokkaido, Hokkaido, Japan
- Michito Sadohara  
Department of Community, Family, and General Medicine, Kumamoto University, Kumamoto, Japan
- Saori Nonaka  
Department of General Medicine, Taito Hospital, Tokyo, Japan
- Kazuya Nagasaki  
Department of Internal Medicine, Mito Kyodo General Hospital, Ibaraki, Japan
- Yoshito Nishimura  
Department of General Medicine, Okayama University Hospital, Okayama, Japan
- Takahiro Matsuo  
The Department of Infectious Diseases, St. Luke's International Hospital, Tokyo, Japan
- Kumiko Muramatsu  
Department of Clinical Psychology, Graduate School of Niigata Seiryō University, Niigata, Japan
- Tetsuya Makiishi  
Department of General Medicine, Faculty of Medicine, Shimane University, Shimane, Japan

\* Correspondence to: Emergency and Critical Care Center, Kurashiki Central Hospital, 1-1-1 Miwa Kurashiki, Okayama 710-0052, Japan.  
E-mail address: ak13568@kchnet.or.jp (A. Kuriyama).