

Article

Job Stress Related to Burnout Among Emergency Physicians Before the COVID-19 Pandemic in Japan

Hiroteru Okamoto

Department of Health and Welfare, Faculty of Health Sciences, Kyorin University, Tokyo 181-8612, Japan; hph-okamoto@ks.kyorin-u.ac.jp

Abstract: The association between job stress and burnout among emergency physicians is not fully understood. This study aimed to examine the relationship between stressors and burnout among physicians working in tertiary emergency medical centers in Japan. A 2014 cross-sectional study with 256 Japanese emergency physicians from 75 tertiary emergency medical centers incorporated a job stress questionnaire and the Pines Burnout Measure. Multiple logistic regression analysis was performed to determine the odds ratios of job stress factors associated with an increased risk of burnout. Ninety-eight (38.3%) participants were classified as experiencing burnout. The results showed that emergency physicians in the burnout group experienced significantly high physical overload, high interpersonal conflict, low job control, and low job suitability as job stressors. Low supervisor and family/friend support was significantly associated with burnout. Free-response data suggested that factors such as “no discretion or decision-making power”, “awareness that I am not suitable for emergency medical care”, and “dealing with patients and their families” may have contributed to the state of burnout among Japanese emergency physicians before the COVID-19 pandemic. Given the anticipated return to pre-pandemic conditions, addressing the risk factors of burnout identified in this study may assist Japanese emergency physicians in preventing burnout.

Keywords: burnout; emergency physicians; interpersonal conflict; job control; job stress; job suitability



Academic Editor: Domenico De Berardis

Received: 25 February 2025

Revised: 30 March 2025

Accepted: 9 May 2025

Published: 14 May 2025

Citation: Okamoto, H. Job Stress Related to Burnout Among Emergency Physicians Before the COVID-19 Pandemic in Japan. *Psychiatry Int.* **2025**, *6*, 57. <https://doi.org/10.3390/psychiatryint6020057>

Copyright: © 2025 by the author. 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/>).

1. Introduction

Since 2019, several studies have highlighted the prevalence of burnout caused by the recent COVID-19 global pandemic among physicians working in emergency departments [1–6]. Emergency physicians (EPs) on the frontlines were overworked due to the rapid increase in the number of critical patients. Their burnout rates ranged from 47.4% to 80% in countries such as Turkey [2], the US [3], Canada [4], Japan [5], and Argentina [1]. Two years have passed since the end of the COVID-19 pandemic, but no data prove that the work conditions and workload of EPs have returned to the normalcy of the pre-COVID-19 levels [7]. However, a recent study of doctors and nurses working in the emergency department and infected with SARS-CoV-2 revealed job stress due to COVID-19 [7]. Furthermore, a study on female military doctors reported that burnout during the pandemic was influenced by COVID-19-related factors (such as filling in for infected doctors' shifts, long working hours, shortages of personal protective equipment, and difficulties in dealing with deceased patients) [8]. These results suggest that there was a temporary COVID-19-related workload during the COVID-19 pandemic, and now that the COVID-19 pandemic has

ended, the aforementioned COVID-19-related workload has disappeared, and it is speculated that the work conditions and workload of EPs have returned to pre-pandemic levels.

Prior to the pandemic, numerous global studies found that EPs experienced burnout due to excessive routine workloads [9–19], with the prevalence of burnout ranging from 25.4% to 86.1% in China [18], France [11], the US [15–17], Canada [14], Ireland [10], Israel [9], and Russia [13]. In Serbia, EPs had significantly higher scores of both job-related burnout and patient-related burnout than emergency department nurses [19].

This suggests that high levels of burnout among EPs could be associated with working in emergency departments [6,13]. These prior studies also found that females [4,5], medical residents [6,15,17], unsatisfactory work experiences [2,5], inadequate workforce levels [5], work–family conflicts [7,11], poor teamwork [11], extended working hours [7,13], night shifts [13], insufficient sleep [1], a low degree of freedom at work, which was similar to low job control [7], low influence in the workplace [7], and low salaries [13] were significant risk factors for burnout among EPs. Conversely, a study proposed that being of an older age and living with children at home are associated with lower burnout levels [4]. Thus, several studies have suggested a relationship between work-related stress and EPs burnout [2,5,7,11,13].

Interestingly, only one study has addressed burnout among EPs in pre-pandemic Japan, reporting a prevalence rate of 10–20% among 32 EPs in the early 2000s [12]. Following the pandemic, measures to prevent exposure to infectious diseases are expected to persist. However, now that the COVID-19 pandemic has subsided, it is likely that the work situation and workload of EPs in Japan have returned to pre-pandemic levels.

This study aimed to clarify the levels of job stressors and burnout among EPs working at a tertiary emergency medical center in Japan in 2014 and to explore the relationship between them. Now that the COVID-19 pandemic has subsided, the results are expected to be useful in preventing burnout among EPs in Japan.

2. Materials and Methods

2.1. Study Design and Participants

This study involved a cross-sectional, multicenter survey administered during the summer of 2014 involving 845 EPs employed in 86 of Japan's 246 tertiary emergency medical centers. The centers were distributed as follows: 11 in the Hokkaido/Tohoku region, 28 in the Kanto/cosmopolitan area, 17 in the Chubu/Tokai area, 16 in the Kinki area, and seven each in the Chugoku/Shikoku and Kyushu/Okinawa regions. There were no responses from EPs working at nine centers who agreed to participate in this study. Of the 845 physicians, 296 from 77 tertiary emergency medical centers agreed to participate in this study and responded to a self-administered questionnaire during their work hours, leading to a response rate of 35.0%. Finally, 256 physicians from 75 centers were briefed on this study's procedures; they were requested to provide written informed consent and completed the Brief Job Stress Questionnaire (BJSQ) and the Pines Burnout Measure (PBM; Figure 1).

Of the 40 EPs excluded, 10 did not provide informed consent, and 30 responded incompletely to the questionnaires. Three EPs with mental illness were included as they were receiving outpatient treatment and could work without hindrance.

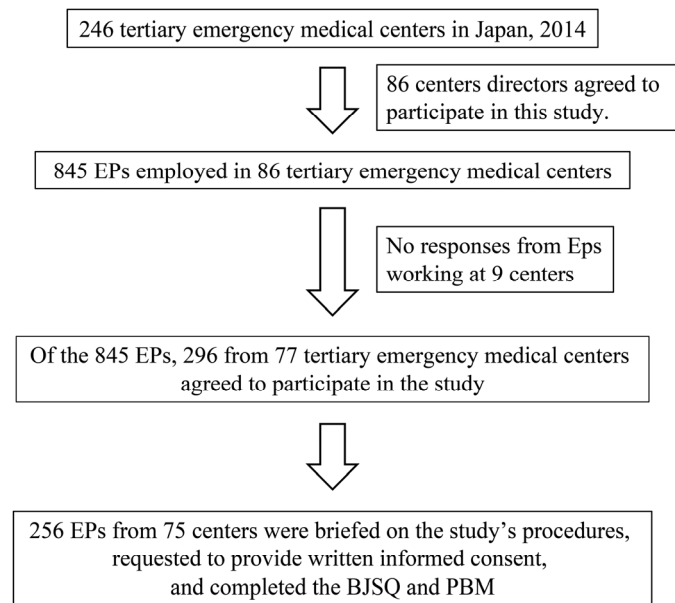


Figure 1. Selection of participants. EPs: Emergency physicians; BJSQ: Brief Job Stress Questionnaire; PBM: Pines Burnout Measure.

2.2. Bias

This study had some selection bias, such as non-respondent bias, volunteer bias, and healthy worker effect. As participants responded to questions about their condition at the time of the survey using a self-administered questionnaire, there was almost no information bias, such as recall or questioner bias.

2.3. Questionnaires

Data from two questionnaires—the BJSQ (Brief Job Stress Questionnaire) and the PBM (Pines Burnout Measure)—were utilized for this study. The BJSQ is a widely utilized instrument for assessing job stress in Japan [20]. Developed as per the NIOSH Generic Job Stress Questionnaire [21] and the job demand–control model [22], it comprises 57 questions, including 17 (Q1–Q17) evaluating nine job stressor items, 29 (Q18–Q46) evaluating five stress reaction items, nine (Q47–Q55) evaluating three social support items, and two evaluating job satisfaction or family life (Q56 and Q57). This study analyzed data from the nine job stressors and three social support items of the BJSQ (Table A1).

The PBM is a self-report questionnaire comprising 21 items, including three components of burnout: physical, emotional, and mental exhaustion. It uses a seven-point rating scale. Scores of 0.0–2.9, 3.0–3.9, 4.0–4.9, and 5.0 or higher represent a healthy state, risk for burnout, a state of burnout, and a state of clinical depression, respectively [23]. The Japanese version was translated by Inaoka et al. [24]. In this study, respondents with a score of 3.0 or less were categorized as the healthy group, while scores higher than 3.0 represented burnout within the group.

2.4. Statistical Analysis

The PBM scores, treated as continuous variables, exhibited non-normal distribution as indicated by the Kolmogorov–Smirnov test ($p < 0.05$). All analyzed data were treated as categorical data, and chi-squared tests were performed.

Multiple logistic regression analyses, employing the stepwise method, or backward elimination, were conducted to adjust for confounding factors and provide odds ratios (adjusted relative risk estimates) reflecting the risk magnitude for burnout states. Each independent variable among the nine job stressors and three types of social support was

binary-coded: amount of work, mental workload, physical overload, interpersonal conflict, and work environment were classified into two categories, the low-normal stress group versus the high-stress group, while job control, skill utilization, job suitability, and job satisfaction were classified into two categories: high-normal versus low. Finally, supervisor support, coworker support, and family/friend support were categorized as high-normal support or low support (Table A2). Independent variables that showed no association in the chi-square test were excluded from multiple logistic regression analysis. The dependent variable utilized two categories of PBM scores—a healthy group (less than 3.0 points) and a burnout group (3.0 points and above).

Statistical analyses were conducted using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA). Statistical significance was defined as $p < 0.05$.

3. Results

Table 1 presents the relationship between characteristics and PBM scores among the 256 EPs. Among them, 98 (38.3%) were classified as the burnout group, defined as having PBM scores of 3.0 or higher; 158 (61.7%) were in the healthy state group (PBM scores of 0.0–2.9). Forty (15.8%) were categorized as experiencing severe burnout, with a PBM score of 4.0 or above. The results of the chi-square test indicated that sex, age, position, marriage, type of emergency medical service, and type of duty were not significantly associated with burnout.

Table 1. Result of the relationship between characteristics and burnout states among 256 emergency physicians.

Characteristics of Participants			All Subjects		Pines Burnout Measure				Chi-Square Test
					Healthy state		Burnout state		
			N = 256		N = 158		N = 98		
Sex	Male	N/%	216	100.0%	136	63.0%	80	37.0%	$p = 0.34$
	Female	N/%	40	100.0%	22	55.0%	18	45.0%	
Age	24–29 years old	N/%	54	100.0%	30	55.6%	24	44.4%	$p = 0.54$
	30–39 years old	N/%	113	100.0%	74	65.5%	39	34.5%	
	40–49 years old	N/%	54	100.0%	31	57.4%	23	42.6%	
	50–61 years old	N/%	35	100.0%	23	65.7%	12	34.3%	
Position	Residents	N/%	72	100.0%	44	61.1%	28	38.9%	$p = 0.64$
	Staff physicians	N/%	132	100.0%	79	59.8%	53	40.2%	
	Managerial physicians	N/%	52	100.0%	35	67.3%	17	32.7%	
Marriage	Married	N/%	179	100.0%	116	64.8%	63	35.2%	$p = 0.13$
	Unmarried	N/%	77	100.0%	42	54.5%	35	45.5%	
Type of emergency medical service (see Table A3)	Tertiary emergency medicine	N/%	76	100.0%	48	63.2%	18	23.7%	$p = 0.95$
	Secondary–tertiary emergency medicine	N/%	42	100.0%	26	61.9%	16	38.1%	
	Primary–tertiary emergency medicine	N/%	138	100.0%	84	60.9%	54	39.1%	

Table 1. Cont.

Characteristics of Participants			All Subjects		Pines Burnout Measure				Chi-Square Test
Type of duty	ER	N/%	91	100.0%	56	61.5%	35	38.5%	$p = 0.92$
	ICU	N/%	24	100.0%	16	66.7%	8	33.3%	
	ER and ICU	N/%	130	100.0%	80	61.5%	50	38.5%	
	Others	N/%	11	100.0%	6	54.5%	5	45.5%	

Table 2 shows the relationship between job stress and burnout states among 256 EPs. Job stressors, barring “skill utilization” and three social supports, were found to be significantly associated with burnout (Table 2).

Table 2. Results of relationship with job stress and burnout states among 256 emergency physicians.

Job Stressor and Social Supports			All Emergency Physicians		Pines Burnout Measure				Chi-Square Test
			N = 256		Healthy state N = 158		Burnout state N = 98		
Amount of work	Low-normal stress	N/%	169	100.0%	112	66.3%	57	33.7%	$p = 0.04$
	High stress	N/%	87	100.0%	46	52.9%	41	47.1%	
Mental workload	Low-normal stress	N/%	153	100.0%	104	68.0%	49	32.0%	$p = 0.01$
	High stress	N/%	103	100.0%	54	52.4%	49	47.6%	
Physical overload	Low-normal stress	N/%	97	100.0%	69	71.1%	28	28.9%	$p = 0.02$
	High stress	N/%	159	100.0%	89	56.0%	70	44.0%	
Interpersonal conflict	Low-normal stress	N/%	198	100.0%	137	69.2%	61	30.8%	$p < 0.01$
	High stress	N/%	58	100.0%	21	36.2%	37	63.8%	
Work environment	Low-normal stress	N/%	197	100.0%	131	66.5%	66	33.5%	$p < 0.01$
	High stress	N/%	59	100.0%	27	45.8%	32	54.2%	
Job control	High-normal control	N/%	190	100.0%	134	70.5%	56	29.5%	$p < 0.01$
	Low control	N/%	66	100.0%	24	36.4%	42	63.6%	
Skill utilization	High-normal utilization	N/%	225	100.0%	139	61.8%	86	38.2%	$p > 0.99$
	Low utilization	N/%	31	100.0%	19	61.3%	12	38.7%	
Job suitability	High-normal suitability	N/%	223	100.0%	150	67.3%	73	32.7%	$p < 0.01$
	Low suitability	N/%	33	100.0%	8	24.2%	25	75.8%	
Job satisfaction	High-normal satisfaction	N/%	237	100.0%	153	64.6%	84	35.4%	$p = 0.01$
	Low satisfaction	N/%	19	100.0%	5	26.3%	14	73.7%	

Table 2. Cont.

Job Stressor and Social Supports			All Emergency Physicians		Pines Burnout Measure				Chi-Square Test
Supervisor support	High-normal support	N/%	212	100.0%	147	69.3%	65	30.7%	$p < 0.01$
	Low support	N/%	44	100.0%	11	25.0%	33	75.0%	
Coworker support	High-normal support	N/%	198	100.0%	138	69.7%	60	30.3%	$p < 0.01$
	Low support	N/%	58	100.0%	20	34.5%	38	65.5%	
Family/friend support	High-normal support	N/%	211	100.0%	146	69.2%	65	30.8%	$p < 0.01$
	Low support	N/%	45	100.0%	12	26.7%	33	73.3%	

Table 3 presents the results of the multiple logistic regression analyses. The logistic regression analysis had a sensitivity of 55.1% and a specificity of 89.2%. Among the independent variables, skill utilization was excluded, having a p -value > 0.99 after the chi-square test. The burnout group was significantly associated with high physical overload, high interpersonal conflict, low job control, low job suitability, low supervisor support, and low family/friend support (Table 3).

Table 3. Results of the multiple logistic regression analyses.

	Factors	Categories	N	Odds Ratio	95%CI	p Value
Confounding factors	Sex	Male	216	1.00		
		Female	40	1.31	0.53–3.20	$p = 0.56$
	Positions	Managerial physicians	52	1.00		
		Staff physicians	132	0.58	0.22–1.50	$p = 0.26$
		Residents	72	0.78	0.35–1.77	$p = 0.55$
Independent variables [†]	Physical overload	Low-normal stress	97	1.00		
		High stress	159	2.05	1.06–3.99	$p = 0.03$
	Interpersonal conflict	Low-normal stress	198	1.00		
		High stress	58	2.28	1.08–4.83	$p = 0.03$
	Job control	High-normal control	190	1.00		
		Low control	66	2.48	1.22–5.05	$p = 0.01$
	Job suitability	High-normal suitability	223	1.00		
		Low suitability	33	5.95	2.12–16.69	$p < 0.01$
	Supervisor support	High-normal support	212	1.00		
		Low support	44	2.87	1.20–6.86	$p = 0.02$
	Family/friend support	High-normal support	211	1.00		
		Low support	45	5.23	2.24–12.22	$p < 0.01$

[†] Stepwise method (Hosmer–Lemeshow test: chi-square value = 4.880, $df = 7$, $p = 0.675$).

Table 4 displays the stressors (free answers) among Japanese EPs. The free responses significantly associated with burnout were “no discretion or decision-making power” and “awareness that I am not suitable for emergency medical care”.

Table 4. Type of stressors among EPs (free responses).

Types of Job Stress		Free Responses		Healthy State		Burnout State		Chi-Square Test	
			N	N = 158	%	N = 98	%		
Job stressors related to burnout state	Physical overload	Irregular work burden	50	27	17.1%	23	23.5%	$p = 0.21$	
		Burden as a result of few days off and prolonged working hours	32	18	11.4%	14	14.3%	$p = 0.50$	
		Awareness of physical burden	19	10	6.3%	9	9.2%	$p = 0.40$	
		Lack of sleep	13	9	5.7%	4	4.1%	$p = 0.77^{\dagger}$	
		Physical burden as a result of age	10	6	3.8%	4	4.1%	$p > 0.99^{\dagger}$	
		Chronic fatigue	8	4	2.5%	4	4.1%	$p = 0.49^{\dagger}$	
	Interpersonal conflict	Interpersonal stress relationships with other departments or professionals	39	22	13.9%	17	17.3%	$p = 0.46$	
		Stressful relationship with supervisors	15	6	3.8%	9	9.2%	$p = 0.07$	
		Stressful relationships with co-workers and subordinates	13	7	4.4%	6	6.1%	$p = 0.57^{\dagger}$	
		Poor work atmosphere	10	5	3.2%	5	5.1%	$p = 0.51^{\dagger}$	
		Job control	Heteronomous work	18	10	6.3%	8	8.2%	$p = 0.58$
			No discretion or decision-making power	14	4	2.5%	10	10.2%	$p < 0.01$
	Job suitability	Being unable to work at your own pace as a result of excessive workload	7	2	1.3%	5	5.1%	$p = 0.11^{\dagger}$	
		Awareness that I am not suitable for emergency medical care	22	8	5.1%	14	14.3%	$p = 0.01$	
		The most burdensome stressors	Work other than medical care (education work, management work, etc.)	37	26	16.5%	11	11.2%	$p = 0.25$
			Interpersonal stress in the workplace	26	12	7.6%	14	14.3%	$p = 0.09$
			Touchoku, night shifts, on-call duties	20	11	7.0%	9	9.2%	$p = 0.53$
			Relationship stress with other departments	19	13	8.2%	6	6.1%	$p = 0.53$
Burden of care for critically ill patients	19		14	8.9%	5	5.1%	$p = 0.26$		
Examination of patients with problems other than illness	15		8	5.1%	7	7.1%	$p = 0.49$		
Stressors other than job stress		Low reward	55	32	20.3%	23	23.5%	$p = 0.57$	
		Lack of private and study time	30	14	8.9%	16	16.3%	$p = 0.07$	
		Anxiety about career and future in emergency medicine	27	16	10.1%	11	11.2%	$p = 0.78$	
		Dealing with patients and their families	10	3	1.9%	7	7.1%	$p < 0.05$	

[†] Fisher's exact test

Among other job stressors, “dealing with patients and their families” was significantly associated with the burnout group (Table 4).

4. Discussion and Conclusions

The results indicate that 38.3% of Japanese EPs experienced burnout in 2014, highlighting associations between burnout and factors like low family/friend support and low job suitability, supervisor support, and job control. Concrete job stressors were identified as potential contributors to burnout, including “no discretion or decision-making power”, “awareness that I am not suitable for emergency medical care”, and “dealing with patients and their families”.

4.1. Ratio of Burnout States

The results indicated that 38.3% of EPs were experiencing burnout, 22.7% were at risk of experiencing burnout (having scored 3.0–3.9 points on the PBM), and 15.6% worked while being in a state of burnout (having scored more than 4.0 points on the PBM). The Japanese EPs are categorized into three main types based on their workplaces: EPs dedicated to the emergency room (ER type), those dedicated to ICUs (ICU type), and those who served in the ER and ICU (ER and ICU types) [25,26]. When comparing the prevalence of burnout with other countries, it is necessary to consider the complexity of the Japanese emergency medical services system (Table A3), the diversity of EPs’ work, and the differences in the burnout measurement tools used.

4.2. Job Stressors Related to Burnout

“No discretion or decision-making power” related to job control and “awareness that I am not suitable for emergency medical care” related to job suitability could have been risk factors for burnout among Japanese EPs in 2014. The former appeared to be a common stressor related to job control. However, the latter might suggest that EPs are required to have an aptitude for emergency medicine.

Concrete job stressors such as irregular work, limited days off, and prolonged working hours, despite being frequently reported among Japanese EPs, were not identified as risk factors for burnout because of their lack of association with the burnout group. This is possibly because of the notion that these job stressors are common stressors for Japanese EPs regardless of whether they experience burnout or not.

Since April 2024, the revised Industrial Safety and Health Act has required Japanese physicians to enforce mandatory rest days and restrict prolonged working hours. Consequently, these steps ensured a reduction in EPs’ physical overload. Among interpersonal conflicts, “interpersonal relationship stress with other departments or professionals” might be a unique stressor for Japanese EPs given the lack of cooperation from doctors in other departments toward emergency medical care in 2014. Among job control, “heteronomous work”, considered to be a distinctive form of job stress within the medical field, arises because of the unpredictability of patient visits. Other concrete job stressors were not associated with the burnout group, possibly because these stressors were present across the Japanese EP population, without distinguishing between normal and burnout groups.

Regarding social support, it was found that low support from superiors may lead to burnout among trainees and young EPs, and low support from family/friends may lead to social isolation.

4.3. Most Burdensome Stressors

It was noted that the most burdensome stressors of EPs were present regardless of whether they had burnout, indicating that the most burdensome stressors of EPs were not associated with burnout. Given that many Japanese physicians are engaged in a variety

of clinical tasks such as outpatient work, ward work, laboratory work, and desk work, “work other than medical care” is a job stressor unique to Japanese physicians. Mitigation measures for “working other than medical care”, which had a high proportion of burnout group respondents, would be useful in reducing stress among Japanese EPs. In Japanese healthcare, touchoku, a conventional practice among physicians of keeping a watch over the ward all night while ensuring adequate sleep, was customarily treated as the night shift [26]. Therefore, touchoku was one of the causes of long working hours for Japanese EPs. Currently, shift work such as night and day duty is becoming increasingly common; thus, the situation of prolonged working hours for EPs is expected to improve.

4.4. Stressors Other than Job Stress

“Dealing with patients and their families” may burden some Japanese EPs experiencing burnout, as emergency medical situations often elicit emotional, sometimes violent responses from patients/families.

The top three stressors (“low reward”, “lack of private and study times”, and “anxiety about career and future in emergency medicine”) were commonly experienced by the Japanese EPs regardless of their burnout. Therefore, there was no relationship between these stressors and burnout.

In Japan, COVID-19 precautions were relaxed on 8 May 2023, and emergency medical settings reverted to their pre-pandemic conditions. Consequently, EPs’ daily routine work is expected to return to its pre-pandemic state. Mitigating the risk factors for burnout identified in this study may help Japanese EPs prevent burnout in the post-COVID-19 period, as well as improve their mental health. Through improving the health of EPs, the results of this study may also contribute to improving the quality of the Japanese emergency medical system.

4.5. The Need for These Research Results in Japan

Of the prior studies, only one has addressed burnout among EPs in Japan [12], and no studies have examined the relationship with job stress. Although the data were 10 years old, considering the unique circumstances of Japanese EPs (the emergency medical system and the work that EPs are involved in are different from those in other countries) [26], the results of this study are expected to be useful in preventing burnout among Japanese EPs. Furthermore, as mentioned above, it has now been two years since the COVID-19 pandemic ended, and it is assumed that the temporary burden of emergency work such as COVID-19 infectious disease work [7,8] has disappeared and work has returned to the pre-pandemic state. Therefore, we believe that taking measures against job stress related to burnout obtained from this study’s results will also be useful in managing the health of EPs. For example, it is believed that early recognition of job stress, which is one of the causes of burnout among EPs in Japan, by EPs themselves and their superiors, and reduction in job stress and strengthening of support from superiors will be helpful in preventing burnout among EPs. Measures that contribute to the health management of EPs in this way are expected to help improve the quality of the emergency medical system.

4.6. Limitations

This study has several limitations. The data in this study are from 10 years ago; however, they are valuable as there are few reports regarding Japanese EPs. It has been observed that even after the COVID-19 pandemic, infection exposure prevention measures continue. However, as the number of COVID-19-infected patients decreases dramatically, it is expected that the workload of EPs will return to pre-pandemic levels. Therefore, even the data from 10 years ago may be useful for improving job stress and burnout in EPs.

Furthermore, the sample size of this study is 250, which may be relatively small. Nonetheless, limited studies exist regarding EP burnout with a large sample size. Due to the large number of questions, the crude response rate (296/845, Figure 1) was low at 35.0%, suggesting the presence of selection bias.

This study did not assess burnout utilizing the commonly used Maslach Burnout Inventory (MBI), which evaluates burnout on three subscales: emotional exhaustion, depersonalization, and personal accomplishment [27]. Its shortcoming is that it cannot evaluate burnout comprehensively given the different cut-off points. Although PBM is not the gold standard on burnout, it corresponds to the emotional exhaustion subscale of the MBI, a primary symptom of burnout. The PBM also has advantages in allowing the degree of burnout to be converted into sequential data [24] and in terms of higher response levels as opposed to the MBI [28].

As shown in Table A3, the emergency medical system in Japan differs from that in Europe and the United States, so it is difficult to generalize the data from this study to countries outside Japan.

4.7. Contribution of This Study

Our results suggest that job stressors related to burnout among Japanese EPs in 2014, before the COVID-19 pandemic, were high physical overload, high interpersonal conflict, low job control, and low job suitability. Additionally, contributing factors include “no discretion or decision-making power”, “awareness that I am not suitable for emergency medical care”, and “dealing with patients and their families”. Following the COVID-19 pandemic, the work burden of EPs is expected to be dominated by job stress from daily tasks, similar to the situation in 2014. These results may be useful for preventing burnout in EPs and managing their health, which may also contribute to improving the quality of the Japanese emergency medical system.

Funding: This research was funded by the Health Science Center Foundation in 2013 (no grant number). A grant title was “A Study for the Health and Job Stress Among Japanese Physicians Working in Emergency Medical Service Centers (Research Director: Hiroteru Okamoto)”.

Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Review Committee of the School of Medicine, Kyorin University (Approval No. 461). It was also conducted in accordance with the Ethical Guidelines for Medical and Health Research Involving Human Subjects in Japan. Written informed consent was obtained from all participants.

Informed Consent Statement: Informed consent was obtained from all subjects involved in this study.

Data Availability Statement: Data are contained within the article.

Acknowledgments: The author thanks all the physicians who participated in this study, Koji Teruya for his advice on data analysis.

Conflicts of Interest: The author declares no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

BJSQ	Brief Job Stress Questionnaire
EPs	emergency physicians
MBI	Maslach Burnout Inventory
PBM	Pines Burnout Measure

Appendix A

Table A1. Nine job stressors and three social support items of the BJSQ [17].

Job Stressor Items and Support Items	Types of Job Stressors and Social Supports	Question Items of the BJSQ
Nine job stressor items		
“amount of work”	job stressor items related to job demands	Q1, Q2, Q3
“mental workload”	job stressor items related to job demands	Q4, Q5, Q6
“physical overload”	job stressor items related to job demands	Q7
“interpersonal conflict”	job stressor items related to job demands	Q12, Q13, Q14
“work environment”	job stressor items related to job demands	Q15
“job control”	job stressor items related to job resources	Q8, Q9, Q10
“skill utilization”	job stressor items related to job resources	Q11
“job suitability”	job stressor items related to job resources	Q16
“job satisfaction”	job stressor items related to job resources	Q17
Three social support items		
“supervisor support”	Social support items	Q47, Q50, Q53
“coworker support”	Social support items	Q48, Q51, Q54
“family/friend support”	Social support items	Q49, Q52, Q55

Table A2. Categories of the nine job stressors and three social support items.

Job Stressor Items and Three Support Items	Category Group	Male	Female
“amount of work” (3–12 points)	low-normal stress group	6–12 points	6–12 points
	high stress group	3–5 points	3–5 points
“mental workload” (3–12 points)	low-normal stress group	6–12 points	7–12 points
	high stress group	3–5 points	3–6 points
“physical overload” (1–4 points)	low-normal stress group	3–4 points	3–4 points
	high stress group	1–2 points	1–2 points
“interpersonal conflict” (3–12 points)	low-normal stress group	8–12 points	8–12 points
	high stress group	3–7 points	3–7 points
“work environment” (1–4 points)	low-normal stress group	3–4 points	3–4 points
	high stress group	1–2 points	1–2 points
“job control” (3–12 points)	high-normal group	3–8 points	3–9 points
	low group	9–12 points	10–12 points
“skill utilization”(1–4 points)	high-normal group	3–4 points	3–4 points
	low group	1–2 points	1–2 points

Table A2. Cont.

Job Stressor Items and Three Support Items	Category Group	Male	Female
“job suitability” (1–4 points)	high-normal group	1–2 points	1–2 points
	low group	3–4 points	3–4 points
“job satisfaction” (1–4 points)	high-normal group	1–2 points	1–2 points
	low group	3–4 points	3–4 points
“supervisor support” (3–12 points)	high-normal support group	3–8 points	3–9 points
	low support group	9–12 points	10–12 points
“coworker support” (3–12 points)	high-normal support group	3–7 points	3–7 points
	low support group	8–12 points	8–12 points
“family/friend support” (3–12 points)	high-normal support group	3–6 points	3–6 points
	low support group	7–12 points	7–12 points

Created by the author based on materials from the Ministry of Health, Labor, and Welfare in Japan (<https://www.mhlw.go.jp/file/05-Shingikai-11201000-Roudoukijunkkyoku-Soumuka/0000050920.pdf>, accessed on 24 November 2024).

Table A3. Overview of the Japanese emergency medical service system.

Types of Emergency Medical Service Systems in Japan	Types of Facilities	Roles of Facilities	Working Physicians
Primary emergency medical services	Primary emergency medical facilities (clinics on duty/night emergency medical centers)	A medical institution that provides appropriate information and initial treatment according to the patient’s condition	Non-emergency physicians (internal physicians, surgeons, orthopedic surgeons, etc.)
Secondary emergency medical services	Secondary emergency medical facilities (secondary emergency hospitals)	A medical institution that accepts patients transported by ambulance 24 h a day, 365 days a year, and provides appropriate information and emergency medical care according to the condition of the sick or injured	Non-emergency physicians (internal physicians, surgeons, orthopedic surgeons, etc.)
Tertiary emergency medical services	Tertiary emergency medical facilities (tertiary emergency medical centers)	A medical institution designated by the prefectural governor, positioned as a critical care medical institution, and accepting patients transported by ambulance 24 h a day, 365 days a year	Emergency physicians (including intensive care physicians)

Created by the author based on materials from the Ministry of Health, Labor, and Welfare in Japan (<https://www.mhlw.go.jp/content/10802000/000328610.pdf>) and Hori [25] (accessed on 24 November 2024).

References

- Appiani, F.J.; Rodríguez Cairoli, F.; Sarotto, L.; Yaryour, C.; Basile, M.E.; Duarte, J.M. Prevalence of stress, burnout syndrome, anxiety and depression among physicians of a teaching hospital during the COVID-19 pandemic. *Arch. Argent Pedr.* **2021**, *119*, 317–324. [\[CrossRef\]](#)
- Bahadirli, S.; Sagaltici, E. Burnout, job satisfaction, and psychological symptoms among emergency physicians during COVID-19 outbreak: A cross-sectional study. *Practitioner* **2021**, *83*, 20–28. [\[CrossRef\]](#) [\[PubMed\]](#)
- Melnikow, J.; Padovani, A.; Miller, M. Frontline physician burnout during the COVID-19 pandemic: National survey findings. *BMC Health Serv. Res.* **2022**, *22*, 365. [\[CrossRef\]](#) [\[PubMed\]](#)
- Mercuri, M.; Clayton, N.; Archambault, P.; Wallner, C.; Boulos, M.E.; Chan, T.M.; Gérin-Lajoie, C.; Gray, S.; Schwartz, L.; Ritchie, K.; et al. Canadian emergency medicine physician burnout: A survey of Canadian emergency physicians during the second wave of the COVID-19 pandemic. *Can. J. Emerg. Med.* **2022**, *24*, 288–292. [\[CrossRef\]](#)
- Morikawa, M.; Uechi, T.; Hanaki, N.; Goto, Y.; Funakoshi, H.; Takeuchi, S.; Mizobe, M.; Yajima, T.; Kondo, Y.; Tanaka, H. Burnout among Japanese emergency medicine physicians: A multicentric questionnaire study. *Acute Med. Surg.* **2023**, *10*, e848. [\[CrossRef\]](#)
- Petrino, R.; Riesgo, L.G.C.; Yilmaz, B. Burnout in emergency medicine professionals after 2 years of the COVID-19 pandemic: A threat to the healthcare system? *Eur. J. Emerg. Med.* **2022**, *29*, 279–284. [\[CrossRef\]](#)
- Lv, C.; Gan, Y.; Feng, J.; Yan, S.; He, H.; Han, X. Occupational stress of physicians and nurses in emergency departments after contracting COVID-19 and its influencing factors: A cross-sectional study. *Front. Public Health* **2023**, *11*, 1169764. [\[CrossRef\]](#)
- Korona-Bailey, J.; Janvrin, M.L.; Shaw, L.; Koehlmoos, T.P. Assessing mid-career female physician burnout in the military health system: Finding joy in practice after the COVID-19 pandemic. *BMC Public Health* **2024**, *24*, 862. [\[CrossRef\]](#)
- Ben-Itzhak, S.; Dvash, J.; Maor, M.; Rosenberg, N.; Halpern, P. Sense of meaning as a predictor of burnout in emergency physicians in Israel: A national survey. *Clin. Exp. Emerg. Med.* **2015**, *2*, 217–225. [\[CrossRef\]](#)
- Chernoff, P.; Adedokun, C.; O'Sullivan, I.; McManus, J.; Payne, A. Burnout in the emergency department hospital staff at Cork University Hospital. *Ir. J. Med. Sci.* **2019**, *188*, 667–674. [\[CrossRef\]](#)
- Estryn-Behar, M.; Doppia, M.A.; Guetarni, K.; Fry, C.; Machet, G.; Pelloux, P.; Aune, I.; Muster, D.; Lassaunière, J.-M.; Prudhomme, C. Emergency physicians accumulate more stress factors than other physicians—results from the French SESMAT study. *Emerg. Med. J.* **2011**, *28*, 397–410. [\[CrossRef\]](#) [\[PubMed\]](#)
- Kishi, Y.; Muraoka, M.; Kurosawa, H.; Koido, Y.; Yamamoto, Y.; Yazaki, S.; Nagao, K.; Kojima, T. Burnout, depression, and quality of life among Japanese emergency physicians. *Jpn. J. Gen. Hosp. Psychiatry* **2000**, *12*, 135–143.
- Liadova, A.V.; Korkiya, E.D.; Mamedov, A.K.; Panich, N.A. The burnout among emergency physicians: Evidence from Russia (sociological study). *Man India* **2017**, *97*, 495–507.
- Lim, R.; Van Aarsen, K.; Gray, S.; Rang, L.; Fitzpatrick, J.; Fischer, L. Emergency medicine physician burnout and wellness in Canada before COVID-19: A national survey. *Can. J. Emerg. Med.* **2020**, *22*, 603–607. [\[CrossRef\]](#)
- Lin, M.; Battaglioli, N.; Melamed, M.; Mott, S.; Chung, A.S.; Robinson, D. High prevalence of burnout among US emergency medicine residents: Results from the 2017 National Emergency Medicine Wellness Survey. *Ann. Emerg. Med.* **2019**, *74*, 682–690. [\[CrossRef\]](#)
- Shanafelt, T.D.; Boone, S.; Tan, L.; Dyrbye, L.N.; Sotile, W.; Satele, D.; West, C.P.; Sloan, J.; Oreskovich, M.R. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch. Intern. Med.* **2012**, *172*, 1377–1385. [\[CrossRef\]](#)
- Takayasu, J.K.; Ramoska, E.A.; Clark, T.R.; Hansoti, B.; Dougherty, J.; Freeman, W.; Weaver, K.R.; Chang, Y.; Gross, E. Factors associated with burnout during emergency medicine residency. *Acad. Emerg. Med.* **2014**, *21*, 1031–1035. [\[CrossRef\]](#)
- Xiao, Y.; Wang, J.; Chen, S.; Wu, Z.; Cai, J.; Weng, Z.; Li, C.; Zhang, X. Psychological distress, burnout level and job satisfaction in emergency medicine: A cross-sectional study of physicians in China. *Emerg. Med. Australas* **2014**, *26*, 538–542. [\[CrossRef\]](#)
- Ilić, I.M.; Arandjelović, M.Ž.; Jovanović, J.M.; Nešić, M.M. Relationships of work-related psychosocial risks, stress, individual factors and burnout—Questionnaire survey among emergency physicians and nurses. *Medy Pract.* **2017**, *68*, 167–178. [\[CrossRef\]](#)
- Shimomitsu, T. On planning the special issue, “The Stress Check System”—From the viewpoint of the process of the stress check system establishment. *Stress Sci. Res.* **2016**, *31*, 1–5. [\[CrossRef\]](#)
- Hurrell, J.J.; McLaney, M.A. Exposure to job stress—A new psychometric instrument. *Scand. J. Work Environ. Health* **1988**, *14*, 27–28. [\[PubMed\]](#)
- Karasek, R.A. Job demand, job decision latitude, and mental strain: Implications for job redesign. *Admin. Sci. Q.* **1979**, *24*, 285–308. [\[CrossRef\]](#)
- Pines, A.M. The Burnout Measure. In Proceedings of the National Conference on Burnout in the Human Service, Philadelphia, PA, USA, November 1981.
- Inaoka, F.; Matsuno, K.; Miyasato, K. A study of burnout in nurses and its etiology. *Kango* **1984**, *36*, 81–104.
- Hori, S. Emergency medicine in Japan. *Keio J. Med.* **2010**, *59*, 131–139. [\[CrossRef\]](#)

26. Okamoto, H.; Tsunoda, T.; Teruya, K.; Takeda, N.; Uemura, T.; Matsui, T.; Fukazama, S.; Ichikawa, K.; Takemae, R.; Tsuchida, K.; et al. An occupational health study of emergency physicians in Japan: Health assessment by immune variables (CD4, CD8, CD56, and NK Cell Activity) at the beginning of work. *J. Occup. Health* **2008**, *50*, 136–146. [[CrossRef](#)]
27. Maslach, C.; Jackson, S.E. The measurement of experienced burnout. *J. Occup. Behav.* **1981**, *2*, 99–113. [[CrossRef](#)]
28. Suzuki, E.; Kanoya, Y.; Horii, S.; Takada, E.; Kitaoka-Higashiguchi, K.; Sato, C. The examination of practicality of the Japanese version of Maslach Burnout Inventory (MBI)-focusing on the rates of replies, valid answers, and invalid answers among the replies. *J. Jpn. Soc. Nurs. Res.* **2004**, *27*, 85–90. [[CrossRef](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.