

ORIGINAL ARTICLE

Motivation and hesitation of healthcare workers to work during the H1N1 influenza and COVID-19 pandemics: An exploratory single-centered repeated cross-sectional study

Hisei Imai MD, PhD¹  | Haruko Fukushima MD²  |
Chisato Miyakoshi MD, PhD² | Kunitaka Matsuishi MD, PhD²

¹Health Promotion and Behavior, Graduate School of Medicine/Public Health, Kyoto, Japan

²Kobe City Medical Center General Hospital, Kobe, Japan

Correspondence

Hisei Imai, MD, PhD, Health Promotion and Human Behavior, Graduate School of Medicine/School of Public Health, Kyoto University, Yoshida Konoe-cho, Sakyo-ku, Kyoto 606-8501, Japan.
Email: ihits@hotmail.com

Funding information

None

Abstract

Aim: Pandemics of life-threatening viruses have detrimental impacts on the motivation of healthcare workers to work. However, no study has examined this impact during different pandemics with the same setting and design. This study aimed to reveal similarities and differences in factors associated with willingness and hesitation to work between two recent pandemics, H1N1 influenza and COVID-19, in the same hospital, using the same questionnaire.

Methods: Healthcare workers in one hospital in Japan completed a questionnaire on basic characteristics and stress-related questions during the H1N1 influenza ($n = 1061$) and the COVID-19 ($n = 1111$) pandemics. Logistic regressions were performed to ascertain the effect of personal characteristics and stress-related questions on the likelihood that employees showed strong or weak motivation or hesitation to work.

Results: The feeling of being protected by the hospital was the only factor that significantly decreased hesitation and increased motivation to work, and females felt significantly more hesitation to work than males did in both pandemics.

Conclusions: Hospital managers and government officers should focus on increasing organizational support and caring for female workers to maintain healthcare workers' motivation to work during future pandemics.

KEYWORDS

disease outbreaks, health personnel, observational study, presenteeism, risk management

INTRODUCTION

The willingness of healthcare workers to work is crucial during pandemics. Healthcare workers have played a critical role in maintaining social functioning during the COVID-19 pandemic, but the COVID-19 pandemic seriously damaged their physical and mental health.¹⁻³ It is therefore important to understand the factors that affect their motivation or hesitation to work during pandemics.

Factors associated with healthcare workers' willingness to work have been studied extensively. A scoping review showed that these factors include demographic factors, working environment, employees' self-condition, and organizational factors.⁴ Demographic factors include age, sex, personal sense of religion, patriotism, and duty/role. The working environment includes workload while employees' self-condition includes fear of contagion, knowledge, social skills, self-efficacy, profession, work experience, and support needs.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2023 The Authors. *Psychiatry and Clinical Neurosciences Reports* published by John Wiley & Sons Australia, Ltd on behalf of Japanese Society of Psychiatry and Neurology.

Organizational factors include the safety climate, data validity, policies, financial support, and confidence in employees. Our previous reports during the H1N1 influenza pandemic partially support these factors.^{5,6}

However, it is unclear whether these factors were quantitatively adaptable to other pandemics. Previous studies have examined different settings using different questionnaires, making it difficult to compare the impact of different pandemics on willingness to work. It is important to clarify the external validity of the factors associated with willingness to work for future pandemics, as each pandemic has different characteristics.

For example, the characteristics of the COVID-19 and H1N1 influenza pandemics are completely different. A study speculated that 18.2 million people died worldwide due to the COVID-19 pandemic between January 1, 2020, and December 31, 2021.⁷ The IMF's World Economic Outlook reports that the output loss from the COVID-19 pandemic through 2024 is estimated to be approximately \$13.8 trillion.⁸ In contrast, global mortality associated with the H1N1 influenza pandemic reported 201,200 respiratory deaths with an additional 83,300 cardiovascular deaths in the first year.⁹

The present study aimed to reveal similarities and differences in factors associated with willingness and hesitation to work between two recent pandemics, H1N1 influenza and COVID-19, in the same hospital, using the same questionnaire.

METHODS

Setting and participants

This study was conducted at the Kobe City Medical Center General Hospital (KCGH), a tertiary teaching hospital in Japan, which had 912 and 768 beds in 2009 and 2020, respectively. We distributed the questionnaires from June 22 to July 31, 2009, during the H1N1 pandemic and from April 16 to June 8, 2020, during the COVID-19 pandemic. The study period was approximately 1 month after the hospital admitted an infected patient for the first time. The participants were all employees of the KCGH. The study protocol was approved by the Ethics Committee of KCGH (zn230211).

Questionnaire

Items included personal characteristics such as sex, age (20s, 30s, 40s, 50s, and 60s), job classification (e.g., doctor, nurse, office worker, radiological technologist, clinical laboratory technician, pharmacist, dietician, case worker, physical therapist, occupational therapist, speech therapist, guard person, cleaning staff), and workplace (e.g., ward for infection, emergency, or infection department).

The stress-related questions consisted of 19 items on a four-point Likert scale (0 = never, 1 = rarely, 2 = sometimes, 3 = always). The questions were as follows: "I felt anxious about being infected," "I felt anxious about infecting my family," "I felt burdened by increased quantity

of work," "I felt burdened by the changed quality of work," "I felt anxious about being infected during commuting," "I felt lacking in knowledge about prevention and protection," "I felt lacking in knowledge about infectivity and virulence," "I felt I was being avoided by others," "I felt protected by my country or local government," "I felt protected by my hospital," "I felt anxious about compensation in case of being infected," "I felt hesitant to work," "I felt isolated," "I had an elevated mood," "I had insomnia," "I was physically exhausted," "I was mentally exhausted," "I felt motivated to work," and "I felt I had no choice but to work due to obligation." We asked an additional question about the burden of childcare, including lack of nursery during the H1N1 pandemic, but it was excluded from the COVID-19 pandemic because it could be applied only to a limited number of participants.

Data analysis

Job categories were classified into four categories: doctors, nurses, other clinical support staff (radiological technologist, clinical laboratory technician, pharmacist, dietician, case worker, physical therapist, occupational therapist, and speech therapist), and nonclinical staff (office worker, guard person, cleaning staff, and others). Workplaces were classified into two categories: high-risk environment (ward for the infection, emergency department/infection department) and other. All the responses to the stress-related questions were dichotomized into responses with a score of 2 or 3 (strong) and 0 or 1 (weak). Logistic regressions were performed to ascertain the effect of personal characteristics on the likelihood that employees were strongly or weakly motivated or hesitant to work. The same analysis was conducted on the effects of the stress-related questions. The logistic regression analysis for stress-related questions was adjusted for age, sex, job category, and workplace. IBM SPSS Statistics version 27 (IBM) was used for all the analyses.

Results

The study participants were 1625 and 3217 employees at KCGH during the H1N1 and COVID-19 pandemics, respectively. The questionnaires were distributed to all employees. We received 1081 (66.5%) and 1111 (34.5%) responses in both pandemics, respectively. A total of 1061 (65.3%) responses for H1N1 and 1111 (34.5%) responses for COVID-19 without missing values in motivation and hesitation items were included in the analysis.

The basic characteristics and percentages of people with high motivation and hesitation are shown in Table 1. The distributions of age, sex, and workplace were similar between the two pandemics, but the percentage of nurses was relatively high in the H1N1 pandemic (59.6%) compared to that in the COVID-19 pandemic (27.4%). In addition, percentages of other clinical support staff (20.9%) and nonclinical staff (33.0%) were relatively high in the COVID-19 pandemic compared to those in H1N1 pandemic (other clinical support staff 11.1%, nonclinical staff 16.4%). The percentage of employees

TABLE 1 The basic characteristics and the percentage of people with high motivation and hesitation.

	<i>n</i> (%)		Among the total number of each categories			
	COVID (<i>n</i> = 1111)	H1N1 (<i>n</i> = 1061)	High hesitation, <i>n</i> (%)		High motivation, <i>n</i> (%)	
			COVID (<i>n</i> = 271)	H1N1 (<i>n</i> = 162)	COVID (<i>n</i> = 699)	H1N1 (<i>n</i> = 307)
Age (years)						
20 or more and less than 30	326 (29.3)	412 (38.8)	83 (25.5)	79 (19.2)	196 (60.1)	75 (18.2)
30 or more and less than 40	263 (23.7)	273 (25.7)	67 (25.5)	54 (19.8)	156 (59.3)	71 (26.0)
40 or more and less than 50	237 (21.3)	207 (19.5)	55 (23.2)	16 (7.7)	147 (62.0)	79 (38.2)
50 or more and less than 60	139 (12.5)	133 (12.5)	31 (22.3)	9 (6.8)	96 (69.1)	70 (52.6)
60 or more and less than 70	47 (4.2)	28 (2.6)	5 (10.6)	2 (7.1)	37 (78.7)	11 (39.3)
Missing value	99 (8.9)	8 (0.8)	30 (30.3)	2 (25.0)	67 (67.7)	1 (12.5)
Gender						
Male	351 (31.6)	237 (22.3)	52 (14.8)	22 (9.3)	244 (69.5)	99 (41.8)
Female	747 (67.2)	735 (69.3)	213 (28.5)	136 (18.5)	448 (60.0)	178 (24.2)
Missing value	13 (1.2)	89 (8.4)	6 (46.2)	4 (4.5)	7 (53.8)	30 (33.7)
Job classification						
Doctors	183 (16.5)	135 (12.7)	18 (9.8)	21 (15.6)	112 (61.2)	49 (36.3)
Nurses	402 (36.2)	632 (59.6)	110 (27.4)	115 (18.2)	232 (57.7)	138 (21.8)
Other clinical support staff	244 (22.0)	118 (11.1)	51 (20.9)	9 (7.6)	180 (73.8)	55 (46.4)
Nonclinical staff	273 (24.6)	174 (16.4)	90 (33.0)	17 (9.8)	170 (62.3)	65 (37.4)
Missing value	9 (0.8)	2 (0.2)	2 (22.2)	0	5 (55.6)	0
Working in a high-risk environment						
No	774 (69.7)	688 (64.8)	192 (24.8)	109 (15.8)	493 (63.7)	157 (22.8)
Yes	264 (23.8)	330 (31.1)	63 (23.9)	47 (14.2)	170 (64.4)	137 (41.5)
Missing value	73 (6.6)	43 (4.1)	16 (21.9)	6 (14.2)	36 (49.3)	13 (30.2)

with high hesitation and motivation was generally higher during the COVID-19 pandemic than during the H1N1 pandemic. The exception was the low hesitation of doctors during the COVID-19 (9.8%) compared to that during the H1N1 pandemic (15.6%).

The results of the multivariable logistic regression analysis asserting the effect of personal characteristics, such as age, sex, job classification, and working in a high-risk environment, on motivation and hesitation to work are shown in Table 2. A common factor related to hesitation to work was sex; females felt significantly more hesitation than males did and the extent of the effects were similar between the two pandemics (COVID-19: odds ratio [OR] = 2.8, 95% confidence interval [CI] 1.5–5.5; H1N1: OR = 2.6, 95% CI 1.3–5.2). Job classification tended to influence hesitation to work in the reverse direction between the two pandemics; nurses (OR = 2.8, 95% CI 1.5–5.5), other clinical staff (OR 2.5, 95% CI 1.3–4.9), and nonclinical staff (OR 4.8 95% CI 2.5–9.3) felt significantly more hesitation to work than doctors did during the COVID-19 pandemic, but less hesitation compared to doctors during the H1N1 pandemic.

The influence of age on motivation was similar. Those aged between 60 and 70 years tended to have greater motivation to work

than those aged between 20 and 30 years in the COVID-19 (OR = 2.5, 95% CI 1.1–5.3) and H1N1 (OR = 1.6, 95% CI 0.6–4.5) pandemics, but those aged between 30 and 40 years tended to have less motivation than those aged between 20 and 30 years in the COVID-19 (OR = 0.9, 95% CI 0.7–1.3) and H1N1 (OR = 0.3, 95% CI 0.1–0.9) pandemics.

The number (%) of those who answered “sometimes” or “always” to each stress-related question are shown in Table 3. The percentages of people who felt anxiety about being infected and infecting their family, lack of knowledge about susceptibility and severity, and compensation were relatively higher during the COVID-19 pandemic (79.3%, 85.3%, 57.6%, and 70.6%, respectively) than during the H1N1 pandemic (55.2%, 56.2%, 35.7%, and 46.2%, respectively). With regard to physical and mental conditions, there was a larger percentage of those who experienced insomnia and feelings of being isolated during the COVID-19 pandemic (20.0% and 16.1%, relatively) than during the H1N1 pandemic (4.4% and 7.2%, respectively). On the positive side, more people felt protected by the hospital during the COVID-19 pandemic (37.5%) than during the H1N1 pandemic (18.4%).

TABLE 2 Results of multivariate logistic regression analysis of the effect of personal characteristics on motivation and hesitation to work.

	Multivariate OR (95% CI)			
	Hesitation to work		Motivation to work	
	COVID	H1N1	COVID	H1N1
Age (years)				
20–30	Reference	Reference	Reference	Reference
30–40	0.99 (0.7–1.5)	1.1 (0.8–1.7)	0.9 (0.7–1.3)	0.3 (0.1–0.9)
40–50	0.7 (0.5–1.1)	0.5 (0.2–0.8)	1.2 (0.8–1.8)	0.5 (0.2–1.5)
50–60	0.7 (0.4–1.1)	0.4 (0.2–0.9)	1.6 (0.99–2.4)	0.8 (0.3–2.4)
60–70	0.3 (0.1–0.8)	0	2.5 (1.1–5.3)	1.6 (0.6–4.5)
Gender				
Male	Reference	Reference	Reference	Reference
Female	2.8 (1.5–5.5)	2.6 (1.3–5.2)	0.7 (0.5–1.02)	1.3 (0.8–2.1)
Job classification				
Doctors	Reference	Reference	Reference	Reference
Nurse	2.8 (1.5–5.5)	0.6 (0.3–1.2)	0.95 (0.6–1.5)	0.98 (0.5–1.8)
Other clinical staff	2.5 (1.3–4.9)	0.5 (0.2–1.3)	1.7 (1.1–2.7)	0.9 (0.5–1.5)
Non-clinical staff	4.8 (2.5–9.3)	0.5 (0.2–1.2)	1.02 (0.7–1.6)	1.4 (0.8–2.5)
Working at high-risk environment				
No	Reference	Reference	Reference	Reference
Yes	0.9 (0.6–1.4)	1.03 (0.7–1.6)	1.2 (0.9–1.6)	2.3 (1.6–3.2)

Note: 20–30, 20 or more and less than 30; 30–40, 30 or more and less than 40; 40–50, 40 or more and less than 50; 50–60, 50 or more and less than 60; 60–70, 60 or more and less than 70.

The results of the multivariable logistic regression analysis asserting the effect of stress-related questions on motivation and hesitation to work are shown in Table 4. The analysis was adjusted for age, sex, job category, and workplace. Feelings of being protected by the hospital was the only factor significantly related to the reduction of hesitation (COVID-19: OR = 0.6, 95% CI 0.4–0.8; H1N1: OR = 0.5, 95% CI 0.3–0.96) and increment in motivation to work (COVID-19: OR = 2.1, 95% CI 1.6–2.9; H1N1: OR = 3.3, 95% CI 2.3–4.7) in both pandemics. Various factors were significantly associated with hesitation to work, such as anxiety about being infected, infecting the family, being infected during commuting, compensation, lack of knowledge about susceptibility, severity, prevention, and protection, physical exhaustion, mental exhaustion, feeling of being avoided by others, feelings of being isolated, and having no choice but to work due to obligation. Two factors affected motivation to work negatively in both pandemics: mental exhaustion (COVID-19: OR = 0.7, 95% CI 0.5–0.9; H1N1: OR = 2.2, 95% CI 1.6–3.1) and insomnia (COVID-19: OR = 0.7, 95% CI 0.5–0.9; H1N1: OR = 2.9, 95% CI 1.5–5.6).

DISCUSSION

It is important to know the common factors that reduce the hesitation and increase the motivation of healthcare workers to work during serious pandemics, regardless of the type of virus.

Various studies have examined the factors that influence the motivation and mental health of healthcare workers during serious pandemics, but these studies were conducted independently with different settings and study designs. This resulted in a lack of comparability of the universal factors that influence the motivation of healthcare workers to work during serious pandemics.

The present study examined the influence of basic demographics and stress-related factors on hesitation and motivation to work in two different pandemics in the same setting and with the same study design. The results showed that the feeling of being protected by the hospital was the only factor that significantly decreased hesitation and increased motivation to work, and that females felt hesitation to work significantly more than males did during both pandemics.

A previous systematic review of health workers' turnover intention during COVID-19 showed that five factors were related to it: fear of COVID-19 exposure, psychological responses to stress, sociodemographic characteristics, adverse working conditions, and organizational support.¹⁰ The present results also show that these factors are associated with hesitation and motivation to work in various ways. However, there were some differences in the details.

Previous systematic reviews showed that married nurses,¹¹ male nurses,¹¹ senior nurses,¹² and young healthcare workers¹³ presented a high risk of turnover intention. The present results showed that those aged between 30 and 40 years tended to have less motivation and those aged between 60 and 70 years tended to have more

TABLE 3 The number (%) of those who answered “sometimes” or “always” to each stress-related question.

	Strong, n (%)		Among the people who answered strong			
			High hesitation, n (%)		High motivation, n (%)	
	COVID	H1N1	COVID	H1N1	COVID	H1N1
Risk of infection						
Anxiety about being infected	881 (79.3)	586 (55.2)	246 (27.9)	137 (23.4)	565 (64.1)	175 (29.9)
Anxiety about infecting family	948 (85.3)	593 (56.2)	254 (26.8)	122 (20.6)	607 (64.0)	189 (31.9)
Anxiety of being infected during commuting	636 (57.2)	496 (46.9)	195 (30.7)	112 (22.6)	398 (62.6)	146 (29.4)
Knowledge and measurement						
Lack of knowledge about susceptibility and severity	640 (57.6)	377 (35.7)	200 (31.3)	84 (22.3)	395 (61.7)	116 (30.8)
Lack of knowledge about prevention and protection	294 (26.5)	229 (21.6)	117 (39.8)	57 (24.9)	168 (57.1)	66 (28.8)
Protection						
Feeling of being protected by country and local government	112 (10.1)	72 (6.8)	21 (18.8)	5 (6.9)	89 (79.5)	42 (58.3)
Feeling of being protected by hospital	417 (37.5)	195 (18.4)	66 (15.8)	18 (9.2)	308 (73.9)	104 (53.3)
Anxiety about compensation	784 (70.6)	489 (46.2)	240 (30.6)	117 (23.9)	488 (62.2)	144 (29.4)
Condition						
Burden of increase quantity of work	492 (44.3)	395 (37.4)	159 (32.3)	69 (17.5)	285 (57.9)	130 (32.9)
Burden of change of quality of work	248 (22.3)	382 (36.2)	95 (38.3)	62 (16.2)	158 (63.7)	135 (35.3)
Physical exhaustion	413 (37.2)	383 (36.2)	155 (37.5)	78 (20.4)	244 (59.1)	131 (34.2)
Mental exhaustion	551 (49.6)	377 (35.7)	196 (35.6)	28 (59.6)	322 (58.4)	85 (22.5)
Insomnia	222 (20.0)	47 (4.4)	92 (41.4)	12 (25.5)	122 (55.0)	28 (59.6)
Elevated mood	94 (8.5)	123 (11.6)	23 (24.5)	19 (15.4)	68 (72.3)	79 (64.2)
Isolation						
Feeling of being avoided by others	154 (13.9)	153 (14.5)	63 (40.9)	45 (29.4)	79 (51.3)	36 (23.5)
Feeling of being isolated	179 (16.1)	76 (7.2)	83 (46.4)	32 (42.1)	97 (54.2)	29 (38.2)
Others						
Feeling of having no choice but to work due to obligation	896 (80.6)	686 (65.1)	238 (26.6)	121 (17.6)	580 (64.7)	209 (30.5)

motivation than those aged between 20 and 30 years. Additionally, regardless of age and sex, nurses felt more motivated than doctors did in the COVID-19 pandemic, but less motivated than doctors did in the H1N1 pandemic.

Female sex was a common factor related to higher hesitation to work in both pandemics in the present study, after adjusting for age, job classification, and workplace. Women are still at the center of housework in Japan. The survey by the Statistics Bureau, Ministry of Internal Affairs and Communications, indicated that women spent about seven times as much time on housework as men did.¹⁴ Their responsibility to maintain a home may have caused hesitation to work during the pandemics. A study conducted in Nigeria also showed that female healthcare workers were more likely to report an increase in household burden than males and that increased household decreased work attendance.¹⁵ Another study showing that married nurses presented a high risk of turnover intention may also support the relation between household burden and absence from work.¹¹ Women who had children came into contact with kindergartens and

schools. There were some cases where kindergartens refused to accept children whose mothers worked in high-risk environments.¹⁶ Such stigmatization may have made them feel isolated from people outside of the hospital.

These results suggest that the effect of basic demographics, such as age, sex, and job classification, may vary according to the culture or condition of the pandemic. Future studies should explore more substantial or actual elements that affect motivation and hesitation through other study designs such as qualitative research.

Psychological responses to stress have also been suggested to be important factors.¹⁰ The present study indicated that physical and mental exhaustion, insomnia, feelings of being avoided by others, and isolation increased hesitation to work in both pandemics. However, the effects of physical and mental exhaustion on motivation to work during the two pandemics were the opposite; they decreased the motivation to work during the COVID-19 pandemic but increased the motivation to work during the H1N1 pandemic. One possible explanation for this is the extent of exhaustion. The physical and

TABLE 4 Multivariable logistic regression analysis of the effect of the stress-related questions on the motivation and hesitation to work.

	Hesitation, OR (95% CI)		Motivation, OR (95% CI)	
	COVID	H1N1	COVID	H1N1
Risk of infection				
Anxiety about being infected	2.8 (1.7–4.6)	4.7 (2.9–7.4)	1.2 (0.9–1.7)	1.2 (0.9–1.6)
Anxiety about infecting family	2.9 (1.6–5.2)	2.4 (1.6–3.5)	1.4 (0.97–2.1)	1.5 (1.1–2.0)
Anxiety of being infected during commuting	2.1 (1.5–3.0)	2.6 (1.8–3.8)	0.95 (0.7–1.3)	1.3 (0.98–1.9)
Knowledge and measurement				
Lack of knowledge about susceptibility and severity	2.2 (1.6–3.1)	1.8 (1.2–2.5)	0.96 (0.7–1.3)	1.4 (1.01–1.9)
Lack of knowledge about prevention and protection	2.7 (1.9–3.7)	1.8 (1.2–2.8)	0.7 (0.5–0.99)	1.1 (0.8–1.6)
Protection				
Feeling of being protected by country and local government	0.9 (0.5–1.5)	0.3 (0.95–1.02)	2.1 (1.2–3.5)	4.0 (2.3–7.2)
Feeling of being protected by hospital	0.6 (0.4–0.8)	0.5 (0.3–0.96)	2.1 (1.6–2.9)	3.3 (2.3–4.7)
Anxiety about compensation	3.5 (2.2–5.5)	3.3 (2.2–4.8)	1.01 (0.7–1.4)	1.4 (0.99–1.9)
Condition				
Burden of increase quantity of work	2.0 (1.4–2.9)	1.3 (0.9–1.9)	1.2 (0.9–1.7)	1.03 (0.8–1.4)
Burden of change of quality of work	2.4 (1.7–3.3)	1.01 (0.7–1.5)	0.7 (0.6–0.97)	1.4 (0.98–1.9)
Physical exhaustion	2.5 (1.8–3.4)	1.8 (1.3–2.7)	0.8 (0.6–1.1)	1.4 (0.98–1.9)
Mental exhaustion	3.3 (2.4–4.6)	2.1 (1.4–3.1)	0.7 (0.5–0.9)	2.2 (1.6–3.1)
Insomnia	2.9 (2.0–4.0)	2.2 (1.04–4.5)	0.7 (0.5–0.9)	2.9 (1.5–5.6)
Elevated mood	1.7 (1.01–2.9)	1.2 (0.7–2.1)	1.1 (0.7–2.0)	4.9 (3.1–7.7)
Isolation				
Feeling of being avoided by others	2.8 (1.9–4.2)	2.1 (1.4–3.3)	0.6 (0.4–0.9)	0.9 (0.6–1.4)
Feeling of being isolated	3.5 (2.4–5.2)	3.8 (2.1–6.6)	0.6 (0.4–0.9)	1.6 (0.9–2.7)
Other				
Feeling of having no choice but to work due to obligation	2.0 (1.2–3.1)	1.7 (1.1–2.6)	1.7 (1.2–2.4)	1.3 (0.9–1.8)

mental burden may have been much less in the H1N1 pandemic than in the COVID-19 pandemic, which may have resulted in the difference. In fact, the percentage of those who felt strong exhaustion was higher during the COVID-19 pandemic than those during the H1N1 pandemic, and the elevated mood significantly increased motivation during the H1N1 pandemic. Modest exhaustion may stimulate motivation in the short term, whereas serious exhaustion may damage motivation.

The percentage of those who felt strong physical exhaustion was similar in both pandemics, but the percentage of those who felt mental exhaustion, insomnia, and isolation was relatively higher during the COVID-19 pandemic than during the H1N1 pandemic. In fact, another analysis conducted on a similar sample showed that psychological impact measured by mean (SD) score of the Impact of Event Scale Revised was 12.7 (13.3)² in the COVID-19 pandemic (a cutoff score for clinical concern for PTSD is 24/25)¹⁷ and 2.49 (6.63)⁵ in the H1N1 influenza pandemic (a cutoff score of 25/26 is grounds for psychological referral).¹⁸ The severity and infectivity of the virus were unclear at the time of research in the H1N1 pandemic

because the hospital was the first to accept a patient infected with the H1N1 influenza virus. However, it was clearer at the time of research on COVID-19, as the world watched the outbreak on the cruise ship Diamond Princess.¹⁹ At the time of the survey, it has been 3 months since WHO published the first disease outbreak news and the Japanese government confirmed the country' first case of COVID-19.^{20,21} The numbers of confirmed cases of COVID-19 were 1,914,916 and 6,931,000 in the world and 9159 and 17,033 in Japan in April 16, 2020 and June 8, 2020, respectively.^{22–24} KCGH admitted its first COVID-19 infected patient on March 3, 2020, nosocomial infection occurred among seven hospitalized patients and 29 staff members in April, 2020. The alpha variant had not been reported at the time of the survey. The number of patients admitted with severe COVID-19 increased 1036 to the end of October 2021.² This may have caused severe mental stress in hospital workers during the COVID-19 pandemic.

A previous study suggested that adverse working conditions are related to turnover intention.¹⁰ The present results indicate that the burden of increased quantity of work and change in the quality of



work significantly increased hesitation to work during the COVID-19 pandemic, but the increase was not significant during the H1N1 pandemic. The effects of these factors may depend on the pandemic conditions.

Lastly and most importantly, the feeling of being protected by the hospital decreased hesitation and increased motivation to work during the two pandemics. The extent of this effect was similar for the two pandemics. Hence, managers should focus on this factor, regardless of the type of pandemic.

The present management of the COVID-19 pandemic by the hospital under study was better than that of the H1N1 pandemic, which led to an increase in feelings of being protected by the hospital. The percentage of those who strongly felt protected by the hospital was 37.5% (18.4%) for the COVID-19 (H1N1) pandemic. The assessment included regular messages regarding protection, comfort, and gratitude from the director and infection control team (ICT) of the hospital; provision of updated information about the virus through the top page of the electronic health record system; quick opening of the consultation service for those infected; provision of hotels for those who could not return home; and allowance for absence from work. Additionally, for those who were absent from work due to COVID-19 infection, the hospital mailed a package with a message from the director of the nursing department, and self-care information from the ICT. The director of the hospital arranged a kitchen car during lunchtime when there were restrictions on eating out.

Supportive factors related to organizational support in previous studies included organizational trust and perceived organizational support,²⁵ a positive organizational atmosphere and motivation,²⁶ mindful and empathic leadership,²⁷ supportive leadership,²⁸ good employer communication,²⁹ and trust.³⁰ Considering these factors and the management in the studied hospital, successful organizational support should be conducted by multiple key persons, including the directors of the hospitals, departments, and professional teams, both physically and spiritually.

Additionally, country and local governments should support these managers and hospital workers, as this increases motivation to work during both pandemics. In particular, schemes for compensation should be carefully planned because 70.6% of the respondents in our study reported strong anxiety about compensation during the COVID-19 pandemic.

A limitation of this study may lie in its design. First, since this was a cross-sectional observational study, the results showed an association between factors and motivation and hesitation to work. Interventional studies should be conducted to clarify whether such factors lead to motivation and hesitation to work. Second, although the present study was conducted in the same setting, using the same questionnaire, the population of the hospital was different between the two pandemics, therefore the present study could not examine the responses of the same population. The common factors that influence the motivation and hesitation to work during pandemics may have universality. Third, selection bias in the study population should be considered. The response rate for the COVID-19 pandemic

was much lower than for the H1N1 pandemic. One possible reason is the workload for hospital workers. The rapid spread and severity of COVID-19 was more severe than for H1N1. This may have made it difficult for hospital workers in COVID-19 to complete the survey. If this is correct, the results in COVID-19 may underestimate factors such as workload burden. Fourth, bias due to a self-report questionnaire should be considered. It may lead to social desirability or recall bias. Social desirability bias may lead to overestimation of the motivation to work. Additionally, the present exploratory study did not use a validated scale. Future study should confirm the external validity of the present results with validated scales.

CONCLUSION

Feeling protected by the hospital was related to decreased hesitation and increased motivation to work during pandemics, and being female was related to increased hesitation to work regardless of the kind of pandemic. Managers of hospitals and government officers should focus on these factors to maintain healthcare workers' motivation to work regardless of the kind of pandemic.

AUTHOR CONTRIBUTIONS

H.I., H.F., C.M., and K.M. were involved in the study design. H.I. and C.M. contributed to the data analysis. H.F. and K.M. contributed to the acquisition of data. H.I. drafted the initial manuscript, which was then revised by H.F., C.M., and K.M. All authors approved the final manuscript.

ACKNOWLEDGEMENTS

We thank the hospital staff of Kobe City Medical Center General Hospital for their assistance in this study. This research did not receive any specific grant. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

CONFLICT OF INTEREST STATEMENT

H.I. received a lecture fee from Otsuka Pharmaceutical Co., Ltd. The other authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The dataset supporting the conclusion of the current study is available from the corresponding author on reasonable request.

ETHICS APPROVAL STATEMENT

The study protocol was approved by the Ethics Committee of the KCGH (zn230211).

PATIENT CONSENT STATEMENT

Written informed consent was obtained from the participants.

CLINICAL TRIAL REGISTRATION

N/A.

ORCID

Hissei Imai  <http://orcid.org/0000-0003-3656-5188>

Haruko Fukushima  <http://orcid.org/0000-0001-8616-8813>

REFERENCES

- Gómez-Ochoa SA, Franco OH, Rojas LZ, Raguindin PF, Roa-Díaz ZM, Wyssmann BM, et al. COVID-19 in health-care workers: a living systematic review and meta-analysis of prevalence, risk factors, clinical characteristics, and outcomes. *Am J Epidemiol*. 2021;190(1):161–75.
- Fukushima H, Imai H, Miyakoshi C, Miyai H, Otani K, Aoyama S, et al. Psychological impact of the COVID-19 pandemic on hospital workers in Kobe: a cross-sectional survey. *Psychiatry Clin Neurosci Rep*. 2022;1(2):e8. <https://doi.org/10.1002/pcn5.8>
- Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis. *Brain Behav Immun*. 2020;88:901–7.
- Karimi Dehkordi N, Abbasi AF, Radmard Lord M, Soleimanpour S, Goharinezhad S. Interventions to improve the willingness to work among health care professionals in times of disaster: a scoping review. *Inquiry J Med Care Org Provision Finan*. 2021;58:469580211059959.
- Matsuishi K, Kawazoe A, Imai H, Ito A, Mouri K, Kitamura N, et al. Psychological impact of the pandemic (H1N1) 2009 on general hospital workers in Kobe: pandemic in Kobe. *Psychiatry Clin Neurosci*. 2012;66(4):353–60.
- Imai H, Matsuishi K, Ito A, Mouri K, Kitamura N, Akimoto K, et al. Factors associated with motivation and hesitation to work among health professionals during a public crisis: a cross sectional study of hospital workers in Japan during the pandemic (H1N1) 2009. *BMC Public Health*. 2010;10:672.
- Wang H, Paulson KR, Pease SA, Watson S, Comfort H, Zheng P, et al. Estimating excess mortality due to the COVID-19 pandemic: a systematic analysis of COVID-19-related mortality, 2020–2021. *Lancet [Internet]*. 2022;399(10334):1513–36. [https://doi.org/10.1016/S0140-6736\(21\)02796-3](https://doi.org/10.1016/S0140-6736(21)02796-3)
- (IMF) IMF. *World Economic Outlook*. 2022.
- Dawood FS, Luliano AD, Reed C, Meltzer MI, Shay DK, Cheng P-Y, et al. Estimated global mortality associated with the first 12 months of 2009 pandemic influenza A H1N1 virus circulation: a modelling study. *Lancet Infect Dis*. 2012;12(9):687–95.
- Poon Y-SR, Lin YP, Griffiths P, Yong KK, Seah B, Liaw SY. A global overview of healthcare workers' turnover intention amid COVID-19 pandemic: a systematic review with future directions. *Hum Resour Health*. 2022;20(1):70.
- Mirzaei A, Rezakhani Moghaddam H, Habibi Soola A. Identifying the predictors of turnover intention based on psychosocial factors of nurses during the COVID-19 outbreak. *Nurs Open*. 2021;8(6):3469–76.
- Mercado M, Wachter K, Schuster RC, Mathis CM, Johnson E, Davis OI, et al. A cross-sectional analysis of factors associated with stress, burnout and turnover intention among healthcare workers during the COVID-19 pandemic in the United States. *Health Soc Care Community*. 2022;30(5):2690.
- Yáñez JA, Afshar Jahanshahi A, Alvarez-Risco A, Li J, Zhang SX. Anxiety, distress, and turnover intention of healthcare workers in Peru by their distance to the epicenter during the COVID-19 crisis. *Am J Trop Med Hyg*. 2020;103(4):1614–20.
- Ministry of Internal Affairs and Communications. Survey on time use and leisure activities. 2021. <https://www.stat.go.jp/data/shakai/2021/pdf/gaiyoua.pdf>
- Taiwo M, Oyekenu O, Ekeh F, Dey AK, Raj A. Gender differences in work attendance among health care workers in Northern Nigeria during the COVID-19 pandemic. *E Clinical Medicine*. 2022:52.
- Marika K, Isabel R. Children of nurses in Japan excluded from day care over virus fears. *The Japan times*. 2020.
- Weiss DS, Marmar CR. The impact of event scale-revised. In: Wilson JP, Keane TM editors *Assessing psychological trauma and PTSD: a practitioner's handbook*. New York: Guilford Press; 1997. p. 399–411.
- Sterling M. The impact of event scale (IES): commentary. *Aust J Physiother*. 2008:54.
- Tabata S, Imai K, Kawano S, Ikeda M, Kodama T, Miyoshi K, et al. Clinical characteristics of COVID-19 in 104 people with SARS-CoV-2 infection on the Diamond Princess cruise ship: a retrospective analysis. *Lancet Infect Dis*. 2020;20:1043–50. [https://doi.org/10.1016/S1473-3099\(20\)30482-5](https://doi.org/10.1016/S1473-3099(20)30482-5)
- World Health Organization. Archived: WHO Timeline-COVID-19. 2020; Available from: <https://www.who.int/news/item/27-04-2020-who-timeline-covid-19>
- Japanese Ministry of Labour and Welfare. About the first case of pneumonia related to COVID-19. 2020. https://www.mhlw.go.jp/stf/newpage_08906.html
- World Health Organization. Corona virus disease 2019 (COVID-19) Situation Report-86. 2020.
- World Health Organization. Corona virus disease (COVID-19) Situation Report-140. 2020.
- Japanese Ministry of Labour and Welfare. COVID-19 Open data.
- Sklar M, Ehrhart MG, Aarons GA. COVID-related work changes, burnout, and turnover intentions in mental health providers: a moderated mediation analysis. *Psychiatr Rehabil J*. 2021;44(3):219–28.
- Varasteh S, Esmaeili M, Mazaheri M. Factors affecting Iranian nurses' intention to leave or stay in the profession during the COVID-19 pandemic. *Int Nurs Rev*. 2022;69(2):139–49.
- Wibowo A, Paramita W. Resilience and turnover intention: the role of mindful leadership, empathetic leadership, and self-regulation. *J Leadersh Organ Stud*. 2021;29(3):325–41. <https://doi.org/10.1177/15480518211068735>
- Khattak SR, Saeed I, Rehman SU, Fayaz M. Impact of fear of COVID-19 pandemic on the mental health of nurses in Pakistan. *J Loss Trauma*. 2021;26(5):421–35. <https://doi.org/10.1080/15325024.2020.1814580>
- Cimarolli VR, Bryant NS, Falzarano F, Stone R. Job resignation in nursing homes during the COVID-19 pandemic: the role of quality of employer communication. *J Appl Gerontol*. 2021;41(1):12–21. <https://doi.org/10.1177/07334648211040509>
- Imai H. Trust is a key factor in the willingness of health professionals to work during the COVID-19 outbreak: experience from the H1N1 pandemic in Japan 2009. *Psychiatry Clin Neurosci*. 2020;74:329–30. <https://doi.org/10.1111/pcn.1299>

How to cite this article: Imai H, Fukushima H, Miyakoshi C, Matsuishi K. Motivation and hesitation of healthcare workers to work during the H1N1 influenza and COVID-19 pandemics: an exploratory single-centered repeated cross-sectional study. *Psychiatry Clin Neurosci Rep*. 2023;2:e105. <https://doi.org/10.1002/pcn5.105>