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# FACTORS PREDICTING NURSES' CONSIDERATION OF LEAVING THEIR JOB DURING THE SARS OUTBREAK

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Meng-Kin Lim and Yueliang Leon Guo*

**Key words:** infectious disease outbreak; leaving the job; SARS

Taiwan was affected by an outbreak of severe acute respiratory syndrome (SARS) in early 2003. A questionnaire survey was conducted to determine (1) the perceptions of risk of SARS infection in nurses; (2) the proportion of nurses considering leaving their job; and (3) work as well as non-work factors related to nurses' consideration of leaving their job because of the SARS outbreak. Nearly three quarters (71.9%) of the participants believed they were 'at great risk of exposure to SARS', 49.9% felt 'an increase in workload', and 32.4% thought that people avoided them because of their job; 7.6% of the nurses not only considered that they should not care for SARS patients but were looking for another job or considering resignation. The main predictors of nurses' consideration of leaving their job were shorter tenure, increased work stress, perceived risk of fatality from SARS, and affected social relationships. The findings are important in view of potential impending threats of pandemics such as avian influenza.

## Introduction

Health care workers (HCWs) are at risk of contracting infectious diseases, including those caused by blood and body fluids<sup>1</sup> and air-borne pathogens.<sup>2-4</sup> Among HCWs, nurses are at highest risk of needlestick injuries<sup>5,6</sup> and therefore probably also at highest risk of contracting blood-borne pathogens. Severe acute respiratory syndrome (SARS), a viral respiratory illness caused by the coronavirus, SARS-CoV, is possibly the first globally significant occupational infectious disease to emerge in the twenty-first century. Those HCWs in direct contact with patients, especially when aerosol-generating procedures are involved, were at highest risk.<sup>7</sup> In some cases,

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transmission to HCWs occurred even when they were wearing masks, eye protection, gowns and gloves.

In Taiwan, the first reported case of SARS could be traced back to 25 February 2003. By the end of March, only 22 probable cases had been recognized. However, an outbreak involving one tertiary referral hospital (Ho-Ping Hospital) resulted in that hospital being shut down, followed by the closure of several emergency departments or whole hospitals in several institutions during late April and May 2003. When the epidemic subsided in June 2003, there had been a total of 346 SARS cases in Taiwan, resulting in 73 deaths. Among those infected, approximately one third were HCWs; this was the same for fatal cases. HCWs faced an increased risk of contracting SARS and transmitting the disease to their families and close contacts. In the meantime, they were charged with increased demands at work, as well as the necessity for more protective measures. Some HCWs temporarily or permanently left their job.

The objectives of this study were to determine: (1) the perceptions of risk of SARS infection in nurses; (2) the proportion of nurses considering leaving their job; and (3) work as well as non-work factors related to nurses' consideration of leaving their job because of the SARS outbreak.

## Methods

In late May 2003, we conducted a self-administered anonymous questionnaire survey in four health care settings: one community hospital, and one secondary and two tertiary referral hospitals. Male nurses comprise less than one tenth of all nurses in Taiwan, thus only female nurses who were actively working and had a working tenure of longer than six months were recruited. A total of 907 questionnaires were distributed to nurses and collected one week later. Participation was voluntary and no monetary incentive was offered.

Among the participating institutions, one was involved in the management of SARS patients, while the remaining three were not. In the hospitals that did not take care of confirmed SARS patients, some suspected cases were reported to the Department of Health initially, but later these turned out to be false alarms.

The questionnaire gathered information on occupational and sociodemographic status perceptions of risk of infection and preventive measures, and the impact of the SARS outbreak on personal and work life, organizational support, workload and stress, and social relationships. Responses to a series of statements were recorded on a 7-point Likert scale. A group of occupational health, public health and hospital doctors were involved in constructing the questionnaire. We decided which factors we wanted to study and we went through each item to ensure its construct validity. Two questions specifically enquired about the nurses' continued commitment to their job in the light of SARS, namely: 'I feel that I should not be looking after patients with SARS', and 'I am looking for another job or considering resigning because of the risk'. After the questionnaire was ready, we pilot tested it with 25 HCWs. Several minor modifications were made to wording. The questionnaire was translated into Mandarin Chinese and back translated. The study was approved by the Institutional Review Boards of the National Cheng Kung University Medical Center.

The statistical analysis program SAS JMP (version 5.01) was used for data analysis. Principal component analysis (PCA)<sup>8</sup> was used to group related questions and to

identify the important components of the nurses' perceptions. A total of 32 questions were analyzed by PCA. Factors with an eigenvalue of 1 or greater were used. Multiple logistic regression was performed to determine the significant factors associated with these nurses' consideration of leaving their job.

## Results

The survey started on 25 May and all questionnaires were returned by 14 June 2003. Only nurses who answered all items were included in the final analysis ( $n = 753$ ). The overall response rate was 83%. Most of the nurses were involved in direct patient care (98.5%), and 14.7% reported ever caring for SARS patients (Table 1).

Tables 2 and 3 show the percentages of nurses who 'strongly agreed' or 'agreed' with the statements 'I feel that I should not be looking after patients with SARS' (12.2%) and 'I am looking for another job or considering resigning because of the risk' (25.9%). Additionally, those who agreed with both statements were categorized as 'seriously considering leaving the job' (7.6%). The responses were grouped according to age (Table 2) and job tenure (Table 3) quartiles. The responses to these questions were not related to age, but 'Looking for another job or considering resigning because of the risk of SARS' and 'Considering leaving the job' were related to work tenure, with those who had shorter tenure tending to agree with these two statements.

Table 4 shows factor loading for the 32 questions. A total of seven factors were identified, namely: organizational support, perceived risk of contracting SARS, workload and stress, social relationships, emotional support, perceived fatality of SARS, and personal protective equipment. For each factor, there was at least one question that showed a factor loading of 0.70 or higher. Thus, for each factor, we chose to use the question with the best factor loading for simplicity of further analysis. Hence, from among the 32 questions: 'Clear policies and protocols were instituted for everyone to follow' was used to indicate organizational support; 'I feel that my job puts me at great risk of exposure to SARS' for perceived risk of contracting SARS; 'I have an increase in workload' for workload and stress; 'People avoid me because of my job' for social relationships; 'I feel appreciated by the hospital/clinic/my employer' for

**Table 1** Demographic characteristics and work conditions of the study population

Variable	No.	%	Mean (SD)	Range
Age (years)	753		30.7 (5.7)	20–52
Tenure (years)	753		9.1 (5.5)	0.2–28
Marital status				
Single	411	54.6		
Married	342	45.4		
Job				
Administrative	11	1.5		
Direct patient care	742	98.5		
Ever cared for SARS patients				
No	642	85.3		
Yes	111	14.7		

**Table 2** Relationship between nurses' age and decision on SARS patient care and consideration of leaving their job

	Total	Age group (years)				P-value
		> 34	30–34	27–29	< 27	
No. (%)	753 (100)	193 (25.6)	205 (27.2)	170 (22.6)	185 (24.7)	
Considered that should not care for SARS patients: no. (%)	92 (12.2)	16 (8.3)	30 (14.6)	22 (12.9)	24 (13.0)	0.23
Looking for another job or considering resigning because of the risk of SARS: no. (%)	195 (25.9)	38 (19.7)	63 (30.7)	47 (27.6)	47 (25.4)	0.078
Seriously considering leaving the job ('Yes' to both the above questions): no. (%)	57 (7.6)	8 (4.1)	20 (9.8)	14 (8.2)	15 (8.1)	0.15

emotional support; 'I believe my chance of dying from SARS (over the next year) is higher than dying from cancer' for perceived fatality of SARS; and 'I feel that the protective measures at work are generally effective' for personal protective equipment.

To identify the factors contributing to 'considering leaving the job', multiple logistic regression was carried out for age, job tenure, marital status, ever having contact with SARS patients, and the seven questions identified by PCA as potential predictor variables (Table 5). Nurses with shorter tenure ( $\leq 8.3$  years) had a significantly higher risk of 'seriously considering leaving the job'. Contact with SARS patients was associated with a lower risk of 'seriously considering leaving the job'. Age and marital status were not associated with 'seriously considering leaving the job'. 'Clear policies and protocols were instituted for everyone to follow', 'I feel that my job puts me at great risk of exposure to SARS', and 'I feel appreciated by the hospital/clinic/my employer' were not associated with 'seriously considering leaving the job'. On the other hand, 'I have an increase in workload' (49.9%), 'People avoid me because of my job' (32.4%), 'I

**Table 3** Relationship between nurses' length of job tenure and consideration of leaving their job

	Total	Tenure group (years)				P-value
		> 12.5	8.4–12.5	5.0–8.3	< 5.0	
No. (%)	753 (100)	188 (25.0)	191 (25.4)	190 (25.3)	184 (24.4)	
Considered that should not care for SARS patients: no. (%)	92 (12.2)	16 (8.5)	21 (11.0)	30 (15.8)	25 (13.6)	0.13
Looking for another job or considering resigning because of the risk of SARS: no. (%)	195 (25.9)	31 (16.5)	62 (32.5)	45 (23.7)	57 (31.0)	0.0009
Seriously considering leaving the job ('Yes' to both the above questions): no. (%)	57 (7.6)	6 (3.2)	15 (7.8)	19 (10.0)	17 (9.2)	0.034

**Table 4** Factor loading of reported perception related to SARS

	Factor						
	Organizational support	Perceived risk of contracting SARS	Workload and stress	Social relationships	Emotional support	Perceived fatality of SARS	Personal protective equipment
Eigenvalue	6.60	4.57	2.37	1.94	1.68	1.33	1.10
% variance explained	20.6	14.3	7.4	6.1	5.3	4.2	3.4
Cumulative %	20.6	34.9	42.3	48.4	53.6	57.8	61.2
I have someone to turn to when I have a problem in using personal protective equipment	-0.73	0.08	-0.03	-0.05	0.09	0.01	0.13
Emotional support (eg counselling) is available to those who need help	-0.69	0.11	-0.05	0.06	0.26	0.05	0.02
Clear policies and protocols were instituted for everyone to follow	-0.82	0.05	-0.04	0.05	0.25	0.10	0.04
The policies and protocols were implemented quickly enough	-0.84	0.05	-0.03	0.03	0.27	0.05	0.06
Most staff have adhered consistently to the recommended measures	-0.74	-0.06	0.01	-0.00	0.09	0.02	0.16
I had little difficulty in adhering to the recommended measures	-0.65	-0.04	-0.03	0.00	0.07	0.03	0.33
I feel that my job puts me at great risk of exposure to SARS	0.07	-0.70	0.16	-0.05	-0.09	-0.09	0.01
I am afraid of falling ill with SARS	-0.07	-0.71	0.08	-0.06	-0.03	-0.09	-0.04
I have little control over whether I get infected or not	0.05	-0.70	0.04	-0.04	-0.06	-0.14	-0.07

Table 4 (Continued)

	Factor						
	Organizational support	Perceived risk of contracting SARS	Workload and stress	Social relationships	Emotional support	Perceived fatality of SARS	Personal protective equipment
My family believes that I have a high risk of getting SARS	0.01	-0.62	0.09	-0.11	-0.04	-0.15	-0.02
I believe people close to me are at high risk of getting SARS because of my job	0.10	-0.70	0.01	-0.14	-0.04	-0.16	-0.02
People close to me are worried for my health	0.04	-0.61	0.05	-0.07	0.02	0.10	0.16
People close to me are worried they might get infected through me	-0.05	-0.51	0.10	-0.31	0.07	-0.18	-0.12
There is more conflict among colleagues at work	0.04	-0.04	0.51	-0.19	0.04	-0.24	-0.02
I feel more stressed at work	0.04	-0.25	0.63	-0.02	0.01	-0.02	0.15
I have an increased workload	-0.03	-0.08	0.86	-0.01	-0.05	0.05	-0.03
I have to work overtime	0.01	0.01	0.85	-0.02	-0.09	0.00	-0.02
I have to do work that I normally don't do	0.08	-0.14	0.70	-0.09	-0.07	-0.06	-0.02
I have been afraid of telling my family about the risk I am exposed to	-0.01	0.01	0.11	-0.68	0.02	-0.17	-0.09
People avoid me because of my job	0.03	-0.24	0.04	-0.83	-0.05	-0.08	0.03
People avoid my family members because of my job	-0.03	-0.15	0.05	-0.84	-0.06	-0.09	-0.02
I avoid telling other people about the nature of my job nowadays	0.08	-0.20	0.07	-0.74	0.01	-0.07	0.07
I am confident my employer will look after my medical needs if I were to fall ill with SARS	-0.26	-0.05	-0.00	0.09	0.44	0.07	0.29

**Table 4** (Continued)

	Factor						
	Organizational support	Perceived risk of contracting SARS	Workload and stress	Social relationships	Emotional support	Perceived fatality of SARS	Personal protective equipment
I feel appreciated by the hospital/clinic/my employer	-0.17	0.04	-0.01	-0.06	0.85	0.07	0.09
I feel appreciated by society	-0.13	0.03	-0.01	0.06	0.82	0.02	-0.06
The morale at work has been good	-0.24	0.07	-0.10	-0.03	0.78	0.09	0.10
There are adequate staff at my workplace to handle the different demands	-0.33	0.10	-0.05	0.04	0.56	-0.03	0.11
If I were to get SARS I believe that my chances of survival are poor	0.05	-0.39	0.10	-0.14	-0.12	-0.57	-0.22
I believe my chance of dying from SARS (over the next year) is higher than dying from a road traffic accident	0.10	-0.23	0.11	-0.24	-0.06	-0.86	0.01
I believe my chance of dying from SARS (over the next one year) is higher than dying from cancer	0.10	-0.24	0.05	-0.15	-0.07	-0.87	0.04
I feel that the protective measures at work are generally effective	-0.37	0.00	0.05	-0.01	0.14	0.02	0.81
I am satisfied with the explanation of the necessity and importance of personal protective equipment to me	-0.39	0.09	0.02	0.03	0.18	0.03	0.77



**Table 5** Predictive factors for nurse's consideration of leaving their job ( $R^2 = 0.24$ )

Variable	No. (%)	Odds ratio	95% CI	P-value
Age (years)				
> 34	193 (25.6)	1		
30–34	205 (27.2)	1.34	0.34–6.07	0.6908
27–29	170 (22.6)	0.34	0.06–1.98	0.2184
< 27	185 (24.6)	0.34	0.05–2.27	0.2573
Job tenure (years)				
> 12.5	188 (25.0)	1		
8.4–12.5	191 (25.4)	2.62	0.58–12.70	0.2200
5.0–8.3	190 (25.2)	9.57	1.78–56.81	0.0103
< 5.0	184 (24.4)	13.77	2.17–95.57	0.0064
Marital status				
Single	411 (54.6)	1		
Married	342 (45.4)	1.44	0.66–3.14	0.3575
Contact with SARS patients				
No	642 (85.3)	1		
Yes	111 (14.7)	0.32	0.09–0.89	0.0471
Clear policies and protocols were instituted for everyone to follow				
Yes	520 (69.0)	1		
No	233 (31.0)	1.24	0.57–2.64	0.5860
I feel that my job puts me at great risk of exposure to SARS				
No	213 (28.3)	1		
Yes	540 (71.7)	2.30	0.83–8.14	0.1418
I have an increase in workload				
No	377 (50.1)	1		
Yes	376 (49.9)	3.73	1.82–8.24	0.0006
People avoid me because of my job				
No	509 (67.6)	1		
Yes	244 (32.4)	2.67	1.37–5.30	0.0043
I feel appreciated by the hospital/clinic/my employer				
No	501 (66.5)	1		
Yes	252 (33.5)	0.91	0.41–1.98	0.8205
I believe my chance of dying from SARS (over the next year) is higher than dying from cancer				
No	613 (81.4)	1		
Yes	140 (18.6)	4.70	2.43–9.16	< 0.0001
I feel that the protective measures at work are generally effective				
Yes	618 (82.1)	1		
No	135 (17.9)	0.85	0.38–2.04	0.7053

CI, confidence interval.

believe my chance of dying from SARS (over the next year) is higher than dying from cancer' (18.6%), and 'I feel that the protective measures at work are generally effective' (82.1%) were important predictors for 'seriously considering leaving the job'.

## Discussion

The last reported SARS patient was identified in early June 2003. This survey on nurses' perceptions about their safety and health was therefore conducted during the SARS episode. Approximately one seventh ( $n = 111$ ) of the participants in this study took care of SARS patients, thus the response to this survey best represents general perceptions among nurses during a serious, life-threatening epidemic period. We found that a small but significant proportion (12.2%) of nurses either believed that they should not be looking after SARS patients or were looking for another job or considering resigning because of the risk (25.9%). Those nurses who answered 'Yes' to both questions (7.6%) were deemed as seriously considering removing themselves from their current job.

Nurses with a longer work tenure were found to be less likely to consider leaving their job. This was possibly owing to less commitment in nurses with shorter tenure, and also the fact that nurses with longer tenure may have more difficulty in changing jobs. Those nurses who had already cared for SARS patients were also less likely to consider leaving their job. One study carried out in Taiwan during the SARS outbreak suggested that providing nurses with in-service education about the etiology of SARS and related infection control measures would increase their knowledge and contribute to positive attitudes regarding their perceived risk, personal safety, and potential loss of income and freedom due to quarantine measures.<sup>9</sup> Such education may also reduce nurses' fears regarding the potential consequences of caring for patients with SARS. Those who had cared for SARS patients might have received such in-service education, which reduced their fear and serious consideration of leaving their job. Age did not affect the nurses' serious consideration of leaving their job.

Among the seven factors examined, the most important predictors were 'increased work load and stress', 'perceived fatality of SARS', and 'affected social relationships'. Increased job demand is a well-known work stressor and an increased workload by itself can be a cause for consideration of leaving a job.<sup>10</sup> A separate survey on nurses in psychiatric institutions in Taiwan has shown a threefold risk of job stress among those with high demands compared with those with low demands.<sup>11</sup> For other variables included in the multiple logistic regression, their effects on 'serious consideration of leaving the job' were mutually adjusted. Some variables may therefore seem important, but were still statistically non-significant when adjusted for other variables as in this model. For example: 'I feel that my job puts me at great risk of exposure to SARS' could have been replaced by 'I believe my chance of dying from SARS is higher than dying from cancer', since the former focuses on the risk of infection while the latter focuses on the risk of the fatal consequence of SARS. Similarly, 'I feel appreciated by the hospital/clinic/my employer' was not associated with 'serious consideration of leaving the job', probably because, at the time of a serious epidemic, personal safety and health concerns may be more important than satisfaction derived from mere appreciation.

The primary mode of transmission of SARS is through direct or indirect contact of mucous membrane (eyes, nose or mouth) with infectious respiratory droplets or fomites.<sup>7</sup> At the time of this survey, outbreaks of SARS in HCWs had been linked to the use of aerosol-generating procedures (eg endotracheal intubation, bronchoscopy and treatment using aerosolized medication).<sup>12</sup> Perhaps the most important means of protecting HCWs against SARS was adequate personal protective equipment, especially effective respiratory protection. It is generally believed that N-95 masks were the most effective personal protection gear for HCWs against SARS. The use of these masks became ubiquitous in Taiwan, despite an acute shortage in the initial phase. Most nurses therefore believed that protective measures at work were generally effective (Table 5) and, as a result, belief in the effectiveness of personal protective equipment was not an important predictive factor for nurses' consideration of leaving their job. On the contrary, a perceived risk of fatality associated with SARS was an important predictor for these nurses considering leaving their job. SARS can readily spread to family members and friends,<sup>13,14</sup> thus some HCWs experienced social isolation (either voluntarily or passively) due to the perceived risk of transmission. Therefore the questions 'I have been afraid of telling my family about the risk I am exposed to', 'People avoid me because of my job', 'People avoid my family members because of my job', and 'I avoid telling other people about the nature of my job nowadays' were grouped together by the PCA as one factor, denoted as social relationships. When using 'People avoid me because of my job' as a predictor variable, those who answered 'Yes' to this question were 2.7 times more likely to consider leaving their nursing job (Table 5), indicating social stigmatization as a strong 'push' factor. Moreover, there was inevitable tension for staff because of leaving their family while nursing their patients. The dilemma that staff faced was that they could transmit the infection to family members. Nevertheless, these issues were not adequately addressed by the hospital administrators. We therefore believe that it is important for employers to advocate for nurses so that commitment to the work could be perceived as valuable and comfortable. In addition, for married nurses, there was a trend towards considering leaving their nursing job (Table 5), but this was not statistically significant. It is conceivable that having a partner or children to take care of after work may have reduced nurses' willingness to care for SARS patients. However, this factor appeared to be less important than job tenure, the increase in workload, the perceived possibility of fatality, affected social relationships, and the adequacy of protective equipment.

Nurses constantly face ethical dilemmas in their practice and most nursing education systems require them to adhere to the ethical standards outlined in professional codes of ethics.<sup>15,16</sup> However, many nurses encounter constraints that make it difficult for them to uphold standards, such as during a major infectious outbreak like SARS. There is no existing guideline or code of ethics in Taiwan to deal with situations in which health care workers are at extraordinary risk of infection, especially one that may be fatal. However, the cultural background is such that, while one is practicing nursing, caring for patients should not be refused, even when there is a personal risk. Nurses are expected to have no personal preferences for accepting or rejecting providing care for particular patients. To the best of the authors' knowledge, local hospitals generally have similar policies. As for the government, at one time the Mayor of Taipei City announced that, if health care

workers left their job during the epidemic, this could be considered as serious an offence as soldiers leaving the battlefield against orders. Although refusing to take care of specific patients during an epidemic is generally considered to be breaking codes of ethics, whether nurses have the right to refuse to continue working when work conditions become unsafe remains an issue of controversy, and resigning would probably be without significant consequences. Nonetheless, even if nurses do not leave their jobs during such situations, their competent functioning in extraordinary circumstances can still conceivably be compromised. Hospital administrators and public health workers would do well to focus on these factors because nursing care can be expected to be in high demand precisely during such critical periods. During the epidemic in Canada, some nurses refused to care for patients with suspected SARS,<sup>17</sup> and a few Taiwanese HCWs also temporarily or permanently left their job. One study of Finnish nurses working in intensive care units found that, despite the challenging and probably more risky work environment, a higher salary was an important factor in retention of nurses and their career choice.<sup>18</sup> It is also worth noting that a lower percentage of dental practitioners compared with dental students believed treating HIV positive patients to be their obligation.<sup>19</sup>

Studies investigating HCWs' willingness to provide care for patients with highly infectious diseases are relatively few. However, information obtained from a more globally important condition – acquired immunodeficiency disease (AIDS) – can be used for comparison with this current study. The fear of AIDS has been documented in nurses in the USA.<sup>20</sup> Using factor analysis, the authors of the report summarized US nurses' fear of AIDS as: (1) support for policies that would protect HCWs from AIDS; (2) fear of contact with blood and body fluids of AIDS patients; (3) stigmatization of those who have AIDS; (4) caring only for those who deserve to be helped; (5) concern that HCWs would receive no help if they had AIDS; (6) concern about the financial burden of AIDS; and (7) loss of self-worth by people who have AIDS. Refusal to provide care is not uncommon when the risk of infection is high. However, the relative importance of these factors in affecting willingness to care for AIDS patients is not clearly recognized.

In the same study, by Wang and Paterson,<sup>20</sup> concerning Pennsylvania and New York State rural nurses' willingness to care for persons with AIDS, the most important individual determinants were their feelings of preparedness and favorable attitudes about their personal safety when administering care. The most important social determinants were the degree of upset of respondents' significant others about their caring for AIDS patients and favorable attitudes of the respondents about professional and social concerns related to AIDS. Except for the HCWs' attitude to behaviors associated with a high risk of AIDS, our findings of perceived fatality and affected social relationships as determinants of willingness to care for SARS patients are compatible with those of Preston *et al.*<sup>21</sup>

In this study, several ethical issues have emerged that may need to be addressed in the near future because of the possibilities of global pandemics. Although the labor laws of Taiwan clearly state that employers are required to protect workers, enforcement of these laws has not specially involved protection against infectious agents. During the SARS outbreak, hospital administrators managed to provide some protective equipment but apparently this was not sufficient, as evidenced by the HCWs who became infected.

## Conclusion

The results of our study indicate that, during the period of the SARS outbreak in Taiwan, less than 10% of nurses may have considered leaving their jobs. Shorter job tenure, increased workload and stress, damaged social relationships due to infection risk, and a perceived risk of personal fatality from SARS were important predictors for nurses seriously considering leaving their job. Such findings are important in view of the potential impending threat of pandemics such as avian influenza. In conclusion, additional administrative and emotional support to create a more favorable nursing practice environment during periods of pandemic disease is warranted.

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