Original Article

A Survey of Stress and Impacts in Registered Nurses During the COVID -19 Pandemic

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Abstract

OBJECTIVES: To describe the stress in RNs during COVID-19 pandemic and the impacts of COVID-19 pandemic among RNs, and to gather needs and feedback from RNs during COVID-19 pandemic.

MATERIALS AND METHODS: The sample was 1,073 RNs who provided services to patients with COVID-19. Data were collected through QR Code with the COVID Stress Scales (CSS) and open-ended questions. Data were analyzed using descriptive statistics and content analysis.

RESULTS: The RNs had overall stress at moderate level (2.42 ± 0.63). Analysis of subscale revealed that Danger was the highest stress (2.92 ± 0.75), following by COVID Contamination (2.74 ± 0.75), Xenophobia (2.56 ± 0.90), Compulsive checking and Traumatic stress (2.34 ± 0.71), and Social-Economic Consequence (2.12 ± 0.89). The four impacts of the COVID-19 pandemic were: 1) Work-life imbalance due to increased workload 2) Fear of infection and transmission 3) Inadequate organization support including supply of personal protective equipment and quality vaccines, information support, and unfair compensation in some hospitals, and 4) Ecological changes in both positive and negative directions.

CONCLUSION: Nurse leaders could provide adequate support for necessary equipment and information to the RNs so that they reduce danger-related stress. Compensation should be considered as appropriate for them.

Keywords: Registered Nurse, COVID-19 pandemic, Stress

The third wave of COVID-19 in Thailand started in April 2021.[1,2] It impacted healthcare personnel because infection rates among healthcare personnel increased remarkably. The quarantine resulted in inadequate manpower provision. The number of COVID-19 patients rapidly increased and Thailand COVID-19 situation report on 7th May 2021 showed that[2,3] the ratio of registered nurses and practical nurses was 34% of all healthcare personnel infected with COVID-19. Most hospitals had separated patients with upper respiratory infection (URI) symptoms from general patients. Some hospitals had suspended services for general patients and had adjusted their services to treat COVID-19 patients to respond to an evolving situation, such as changing general patient private rooms to be negative pressure rooms.[3,4] And also, some hotels and dormitories became places of quarantine for COVID-19 patients. The COVID-19 patient in the third wave had a raised death rate from 0.1% (previous wave) to 0.3%. This wave required more manpower of healthcare personnel to cover services according to the Ministry of Public Health plan. COVID-19 pandemic caused anxiety and stress to healthcare personnel in Thailand and all around the world.

The pandemic of COVID-19 caused healthcare personnel in Thailand and worldwide to experience anxiety and stress because they were responsible for treating COVID-19 patients and were at a higher risk for COVID-19 transmission from the nasopharyngeal sampling during swab administration in semi-critical care patients or critical care patients with upper respiratory tract infection, shortness of breath, pneumonia, or on ventilators in Intensive

Care Units (ICU). Although the medical personnel usually protected themselves from the transmission by wearing PPE [5] (Personal Protective Equipment), it did not absolutely guarantee their safety from contracting COVID-19.

China was the first country to experience an outbreak of COVID-19 and the disease spread rapidly. A survey at the beginning of the outbreak reported that physicians and nurses who provided care to severe COVID-19 patients in 34 Critical Care Units in China from 29th January to 7th February 2020 experienced severe symptoms such as insomnia, anxiety, depression and distress especially medical personnel in Wuhan[6]. In the meantime, a survey of the outbreak in USA reported [7,8] that a great number of physicians, nurses, emergency medical technicians (EMTs) and non-clinical staff in May 2020 experienced severe symptoms such as depression, anxiety and burnout. There were many studies reporting that medical personnel in COVID-19 outbreak areas experienced fear, stress, anxiety and depression, and this had also affected their families.[9-14]

In April 2021, Bangkok began to be affected by the third wave of Thailand COVID-19 outbreak. People had been increasingly, instantly and continuously infected with COVID-19. Bangkok reported the highest daily number of COVID-19 cases in Thailand and new cases tended to rise sharply. The number of COVID-19 beds in the capital city for yellow and red critical patients were almost 100% occupied. The government was going in a direction to request the hospitals and sanatoriums to join hands to establish field hospitals (community isolation) to help serve people with COVID-19. Meanwhile, the COVID-19 infection among healthcare personnel was increasing and resulted in workforce shortage, especially registered nurses. Many healthcare personnel felt anxiety and stress and some were worried that they would be carriers of the virus, potentially infecting their family or colleagues. The impact of COVID-19 infection had both a physical and a psychological burden.[9] Stress was a major contributor to work effectiveness and productivity; therefore, the Principle Investigator was interested to study the level of stress among registered nurses during the third wave of COVID-19 outbreak.

There were differences in personal and family factors, job assignment, and COVID-19 patient admission policy in each hospital sector. This resulted in different stress recorded among RNs including danger, social-economic consequence, xenophobia, contamination, traumatic stress, and compulsive checking. Moreover, the stress affected socio-economic status income, work life balance, job satisfaction, intention to leave, health, COVID-19 infected and fatigue, causing fear such as fear of losing income during self-quarantine, fear of foreigners that may bring in the new COVID-19 infection, fear of COVID-19 infection, fear of receiving any news related to COVID-19 etc. which also caused a negative effect in work-life balance, job dissatisfaction, and stress affected decision making to leave the profession entirely.

Definition

Stress is a perception of mental health in COVID-19 pandemic including Danger, Socio-economic consequence, Xenophobia, Contramination, Traumatic stress and Compulsive checking. Impact means “a consequence of stress from COVID-19”.

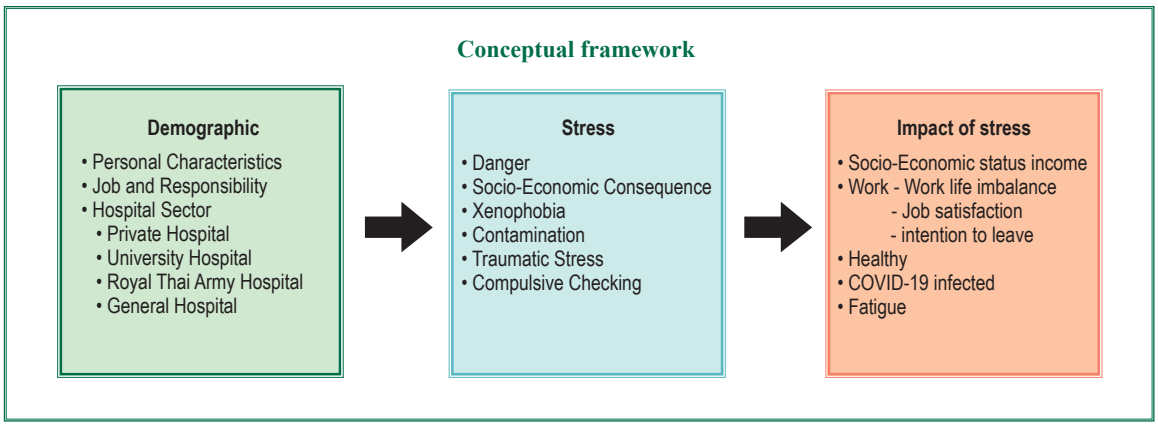

Figure 1: Conceptual Framework showing the impact of stress on Registered Nurses during the COVID-19 pandemic

Materials and Methods

This study was a survey research, the research instrument was a questionnaire, namely “COVID Stress Scales (CSS)” developed from the study of Development and Initial Validation of the CSS conducted by Steven Taylor.[15] The questionnaire included 36 questions divided into 6 parts.

Part 1: Danger
Part 2: Social-Economic Consequence
Part 3: Xenophobia
Part 4: Contamination
Part 5: Traumatic Stress
Part 6: Compulsive checking

Through purposive sampling, 1,073 registered nurses (RNs) who provided nursing services to COVID-19 patients from four sectors of Bangkok, Thailand were recruited, including 583 RNs from a hospital university, 307 RNs from private hospitals, 153 RNs from the Royal Thai Army hospital, and 30 RNs from general hospitals.

The inclusion criteria were registered nurses who provided services for COVID-19 patient care in hospitals in Bangkok. Exclusion criteria, registered nurses who are not providing care to COVID-19 patients.

Quality of Research Instrument

The Principle Investigator studied the instrument and on 6th May 2021, asked the owner for permission to use the instrument. The content validity was then reviewed by 2 English – Thai expert translators. The intervention was then piloted with 30 participants not included in the main study. The research instrument showed a reliability (Cronbach's alpha) of 0.98.

Questionnaire was divided into four parts, using Google forms and linking the form to a QR Code for sharing with respondents. The four parts of the questionnaire included:

- **Part I:** Demographic information such as gender, age, marital status, years of work experience, department, training for COVID-19 patient care, training for wearing PPE and COVID-19 infection history.
- **Part II:** Level of stress measured using CSS (36 questions).
- **Part III:** Work satisfaction in nursing roles and work values.
- **Part IV:** Open-ended questions related to impacts of COVID-19 outbreak.

Ethical considerations

This study was submitted to the Institutional Review Boards as follows:

- The institutional Review Boards, Faculty of Medicine Ramathibodi Hospital, No, IRB: COA.MURA 20201/444 Ref. 1016, Dated 22nd June 2021
- The Institutional Review Boards, Bangkok Hospital Headquarters, No. BHQ-IRB 0221-08-22, Dated 7th September 2021
- The Institutional Review Board, Royal Thai Army Medicine Department, Dated 30th September 2021
- Given that some general and private hospitals do not have Institutional Review Boards, the researcher submitted a letter to each hospital director in question to request permission to collect data.

Rights of a Research Participant

The research participants agreed to consent to participate in the research by answering the questionnaire and also refused to participate by not answering the Google form questionnaire or QR Code that was distributed by the Principle Investigator. The participants had the right to withdraw from the study at any time without any effect. The Principle Investigator had an ethical duty to keep all participants' information confidential. Data were presented in overview form and de-identified before published.

Data Collection

The Principle Investigator coordinated with nursing service organizations for data collection under the approval of hospital directors of a university hospital, a Royal Thai Army hospital, private hospitals and general hospitals in Bangkok. The data were collected from COVID-19 patient samplings; total sample was 1,073. All data collection was undertaken from 1 July – 15 Oct 2021.

Data Analysis

This study was an analysis of both qualitative and quantitative data with the following objectives:

Objective 1: To study the level of stress in registered nurses in COVID-19 pandemic. The descriptive statistic was applied such as average, standard deviation, range, frequency and percentage.

Objective 2: To study the effects toward registered nurses in COVID-19 pandemic.

From the qualitative data, the analysis was used to categorize data according to the objectives.[16]

Results

From Table 1, the total number of all participants is 1,073 RNs. The majority of the participants were female (96.27 %). The number of participants from each sector can be divided as follows: University hospital, Private hospital, the Royal Thai Army hospital, and general hospital which are 583, 307, 153, and 30 people respectively. The average age was 34.34 + SD 9.35 years old. Majority of the participants were single (67.6%) with family members numbering more than four (26.10%). The average work experience was 11.64 years. Most participants worked in IPD (46.23%) and cohort ward (31.69%) and 46.23% of them received COVID-19 training. About 82.48% used to practice PPE training before taking care of COVID-19 patients. In addition, the number of participants who were quarantined and received COVID-19 investigation by swab culture (PCR) was 58.25% while 5.76% were COVID-19 infected. Participants who were detected and undetected stay in hospital (n = 64), hospitel (n = 39) or their home (n =17) while information was not provided for others.

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Table 1: Participants' characteristics (n =1,073)

Characteristics	All Participant		Hospital University		Private Hospital		Royal Thai Army Hospital		General Hospital	
	n = 1073	%	n = 583	%	n = 307	%	n = 153	%	n = 30	%
Gender										
Male	40	3.7	24	4.1	10	3.3	5	3.3	1	3.3
Female	1033	96.3	559	95.9	297	96.7	148	96.7	29	96.7
Age (years)										
Average	34.34		34.7		33.77		33.46		38.27	
Min	21		22		20		21		22	
Max	62		62		58		59		58	
Status										
Single	725	67.57	396	67.9	206	67.1	106	69.28	17	56.67
Married	301	28.05	172	29.5	83	27.0	39	25.49	7	23.33
Widowed /Divorced/Separated	47	4.38	15	2.6	18	5.9	8	5.23	6	20.00
Number of Children to be care for										
No Children	794	74.00	437	74.96	220	71.66	121	79.08	16	53.33
1	153	14.26	79	13.55	50	16.29	16	10.46	8	26.67
2	106	9.88	57	9.78	30	9.77	15	9.80	4	13.33
3	19	1.77	9	1.54	7	2.28	1	0.65	2	6.67
>3	1	0.09	1	0.17						
Numbers of family members										
1 Person	209	19.48	102	17.50	68	22.15	32	20.92	7	23.33
2 Persons	194	18.08	103	17.67	61	19.87	25	16.34	5	16.67
3 Persons	158	14.73	101	17.32	30	9.77	24	15.69	3	10.0
4 Persons	232	21.62	134	22.98	59	19.22	33	21.57	6	20.0
>4 Persons	280	26.10	143	24.53	89	28.99	39	25.49	9	30.0
Number of years of work experienced										
Average	11.64		12.2		10.55		10.63		16.63	
Min	1		1		1		1		2	
Max	43		41		35		38		43	
Participants setting										
Inpatient	496	46.23	246	42.20	150	48.86	88	57.52	12	40
Operative services	239	22.27	172	29.50	45	14.66	15	9.80	7	23.33
Intensive Care Unit	110	10.25	53	9.09	32	10.42	23	15.03	2	6.67
Outpatient	95	8.85	46	7.89	35	11.40	11	7.19	3	10.00
Emergency department	46	4.29	27	4.63	12	3.91	6	3.92	1	3.33
Home health Care	27	2.52	23	3.95					4	13.33
Labor Room	23	2.14	0	0.00	21	6.84	2	1.31		
Anesthesia	18	1.68	16	2.74	1	0.33	1	0.65		
Other	19	1.77			11	3.58	7	4.58	1	3.33
Nurse Job										
Screening COVID patient	132	12.30	70	12.01	34	11.07	18	11.76	10	33.33
To do procedure for swab culture at ARI Clinic	66	6.15	39	6.69	20	6.51	4	2.61	3	10.00
Cohort ward	340	31.69	128	21.96	135	43.97	72	47.06	5	16.67
Intensive Care for COVID -19 patient	99	9.23	59	10.12	22	7.17	16	10.46	2	6.67
Operative services for COVID-19 patient	101	9.41	54	9.26	37	12.05	9	5.88	1	3.33
Labor Room for COVID 19 patient	18	1.68	2	0.34	14	4.56	2	1.31		
Assist physician for procedure in COVID-19 patient	18	1.68	11	1.89	4	1.30	2	1.31	1	3.33
Hospital care for COVID-19 patient	158	14.73	139	23.84	10	3.26	3	1.96	6	20.00
Community Isolation for COVID-19 patient	49	4.57	11	1.89	18	5.86	18	11.76	2	6.67
Other	92	8.57	70	12.01	13	4.23	9	5.88		
Participants receiving in COVID -19 training										
Yes	496	46.23	229	39.28	170	55.37	85	55.56	12	40
No	577	53.77	354	60.72	137	44.63	68	44.44	18	60
Participants who practiced PPE training before taking care of COVID 19 patient										
Yes	885	82.48	460	78.90	266	86.64	136	88.89	23	76.67
No	188	17.52	123	21.10	41	13.36	17	11.11	7	23.33
Participants who receiving COVID-19 investigation by swab culture (PCR)										
Yes	625	58.25	352	60.38	156	50.81	106	69.28	11	36.67
No	448	41.75	231	39.62	151	49.19	47	30.72	19	63.33
The result of COVID-19 test of participants who received investigation										
Detected	36	5.76	15	4.26	14	8.97	5	4.72	2	18.18
Undetected	589	94.24	337	95.74	142	91.03	101	95.28	9	81.82
The participants with detect and undetected COVID 19 quarantine location										
Hospitel	39	6.24	11	3.13	19	12.18	8	7.55	1	9.09
Home	17	2.72	3	0.85	7	4.49	6	5.66	1	9.09
Hospital	64	10.24	1	0.28	49	31.41	14	13.21	0	0.00
No answer	505	80.8	337	95.74	81	51.92	78	73.58	9	81.82

The RNs had overall stress at a moderate level (score = 2.42). The RNs from the private hospital experienced the highest stress levels, 2.51 and the RNs from the university hospital, general hospital, and Royal Thai Army hospital showed moderate stress, 2.46, 2.21, and 2.16 respectively. Moreover, RNs from university hospitals showed the highest stress levels in the aspect of danger (score = 3.06). Besides, the RNs from the private hospital had the highest stress level in all of the other five aspects; Social- Economic Consequence, Xenophobia, Contamination, Traumatic stress, and Compulsive checking 2.28, 2.69 ,2.81 ,2.00, 2.47 respectively (Figure 2) and Table 2 showed satisfaction and professional value level and overall, the mean of job satisfaction was high satisfaction (3.55 ± 0.89) and the mean of professional value was extremely valued. (4.14 ± 0.79)

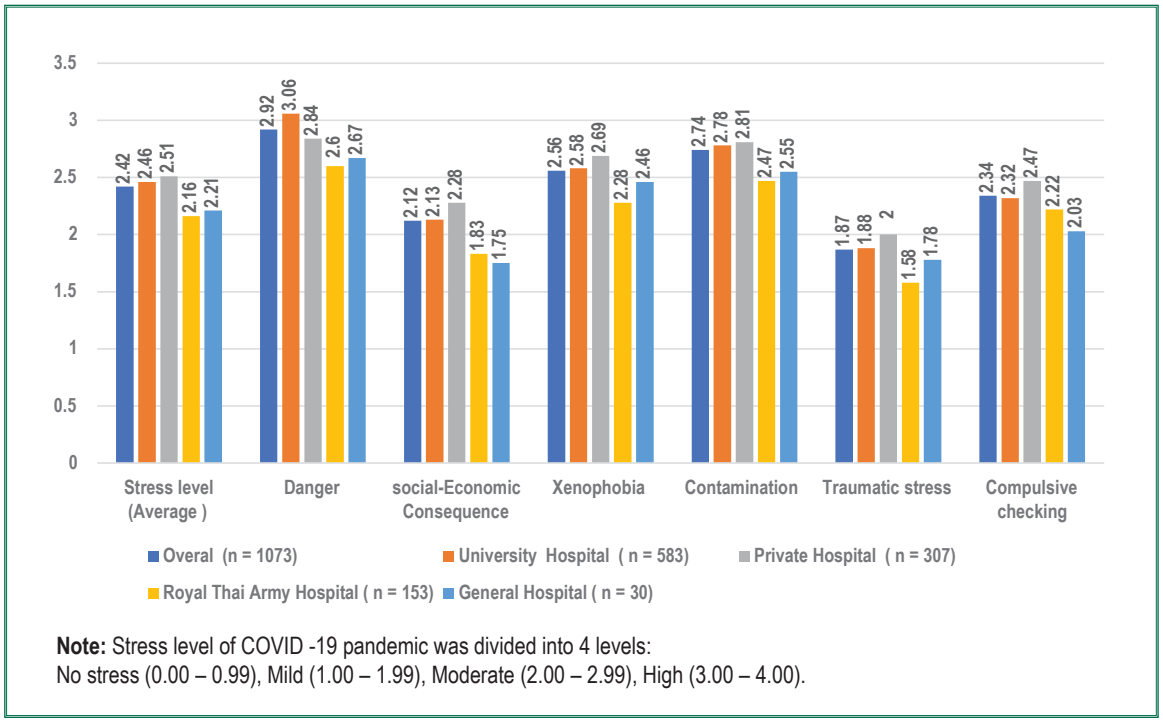

Figure 2: The result of stress level in COVID -19 pandemic in registered nurses

Table 2: Satisfaction and Professional Value of participants (RNs = 1,073)

Topic	Min	Max	Mean	S.D.	Interpretation
Job satisfaction	1.00	5.00	3.55	0.89	Very Satisfied
Professional Value	1.00	5.00	4.14	0.79	Highest Working Value

Interpretative Criteria

0.00 -0.99	Unsatisfied	or	No value
1.00 - 1.99	Mildly satisfied	or	Mild value
2.00 - 2.99	Moderately satisfied	or	Moderate value
3.00 - 3.99	Highly satisfied	or	High value
4.00 - 5.00	Extremely satisfied	or	Extremely valued

Effects from COVID-19 pandemic toward registered nurses were divided into 4 dimensions as follows:

1. Life was not balanced. Livelihood was destroyed. Change forced them to adapt all the time. Unable to return home as usual. Concerned about their family members. Hospital workload engagement. Rotation providing COVID-19 patient care. Less relaxation.
2. Fear of COVID-19 infection and spread. Worrying about disease transmission. Inadequate support from the organization. Insufficient personal protective equipment PPE for work and low confidence in quality of COVID-19 vaccine. The communication on change of direction for providing COVID-19 patient care was limited. Unfair compensation in some hospitals. Delayed risk compensation.
3. Environment changes in positive and negative perspectives such as livelihood; social distancing; mask wearing; communication problems; travelling limitation such as market, department store, restaurant; entertainment and religious activities were restricted.

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4. Registered Nurses needs
   - The information of COVID-19 spread and the explicite adjustment of working policy.
   - The readiness of hospitals to develop registered nurse competency in emerging diseases patient care.
   - Appropriate and timely payment of risk compensation in COVID-19 patient care.
   - Quality vaccine for medical personnel providing care to COVID-19 patients because they were in close contact.
   - Sufficient personal protective equipment such N95 mask and qualified PPE.

Discussion

This research was to study the level of stress of registered nurses in the 3rd wave of COVID-19 outbreak which was at its most serious in Thailand between April to September 2021. Thailand had experienced the 1st wave of COVID-19 outbreak between January and March 2020 and the 2nd wave of COVID-19 outbreak was between July and November 2020. The outcome showed that the majority of participants had moderate stress and traumatic stress was mild because the registered nurse had already experienced the same situation in the 1st and 2nd wave of COVID-19 outbreak. The outcome showed that the registered nurses in university hospitals had high stress in Danger. The greatest worry was COVID-19 infection because the selected university hospital was a place that had a lot of COVID-19 patients in cohort wards and critical care units. The level of overall stress of each hospital group were moderate stress and not different from each other. Meanwhile, the registered nurses were satisfied and valued their work because medical personnel were the most important people providing care to COVID-19 patients. They were respected by society and the public.

The reported stress of the participants may not only be due to COVID-19 pandemic situation as an increasing crisis. Different stressors suggested differing needs such as inadequate PPE, workload, work life imbalance. The participants seem to be most concerned with danger and contamination . This might be explained by the perceived risk of the participants working in less strict isolation. Taylor and colleagues (2020) [15] combined the danger subscale with the contamination subscale, their means when computed separated are not close to each other. The participants scored higher in CSS danger than in CSS contamination. Perhaps this result is because the RNs are still afraid of contracting the virus and that they are worried about efficacy of the healthcare system but they do not necessarily believe that they can get the virus simply from touching something in public spaces, being exposed to someone sneezing or contacting something together. Xenophobia has the second lowest mean among the various subscales. The moderate level of stress scores in xenophobia in relation to the other subscales may be explained by the collectivistic culture of Thailand. The negative relationship of xenophobia and stress suggested that the greater intention to interact with foreigners associated with higher stress or avoidance behavior relates to lower distress. Compulsive checking subscales showed moderate stress and maybe the participants accessed the internet, WHO website to check social media for COVID-19 pandemic related news on a daily basis or government officer teams have been reporting daily on the news too. The last, traumatic stress subscale, the lowest score, showed mild stress the participants still encountered with the COVID-19 situation.

Comparison with other study

In this study the participants reported moderate stress and traumatic stress was mild. This is consistent with a recent study in healthcare workers including RNs for 60.2% at the early stages of COVID-19 pandemic in Australia[17] and a previous study in Northeast Mexico reporting[18] the increasing stress in healthcare professionals during the COVID-19 pandemic due to life imbalance and psycho-traumatic stress.

Conclusion

Nurse and Health administrators could provide adequate support for necessary equipment and information to the RNs so that they reduce danger-related stress. Compensation should be considered as appropriate for them.

Recommendation and Pattern of Research Utilization

The study should have been conducted in the 1st, 2nd and 3rd wave of COVID-19 outbreak in Thailand to compare the level of stress in all three periods. Research or study on the change of registered nurse in COVID-19 outbreak is needed. The RNs learned quickly, through resilience for survival, and by maintaining professionalism. The data should be collected from the samples in each part of Thailand to compare level of stress of registered nurses. The executive should provide and manage resource such as PPE and risk compensation in COVID-19 patient care in an appropriate and timely manner, especially to COVID-19 infected nurses. The executive should have effective manpower management and workforce rotation to prevent burnout of nurses providing care to COVID-19 patients. Preparing standard of practice to enhance the competency of registered nurses in possible emerging disease patient care is recommended.

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