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Association between Occupational Stress and Psychopathological Symptoms Among Nurses in Cardiovascular Hospital During COVID-19 Pandemic

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Abstract

Introduction: Occupational stress is known to be one of the factors that are often found in nursing professionals. Occupational stress can affect a person both physically and mentally. Moreover, the COVID-19 pandemic has brought additional workload for healthcare professionals, including nurses. This study aimed to analyze the association between occupational stress and psychopathological symptoms among nurses in Cardiovascular Hospital during the Covid-19 pandemic.
Methods: This cross-sectional study involved 108 nurses in Cardiovascular Hospital X. Samples were taken by simple random sampling based on inclusion and exclusion criteria. Occupational stress was assessed by Expanded Nursing Stress Scale (ENSS) and psychopathological symptoms were assessed by Symptom Checklist 90 (SCL-90).
Results: The mean ENSS total score was 88,17 ± 32,24 (maximum score of ENSS was 228). 19,4% of nurses had psychopathological symptoms. Somatization, obsessive-compulsive, and psychoticism had higher t-score values than other SCL-90 subscales. There was a strongly significant association between occupational stress and psychopathological symptoms ($p<0,001$).
Conclusion: Its highly recommend early diagnosis and prompt treatment for psychopathological symptoms among nurses. Monitor and evaluation of occupational stress and psychopathology in nurses are recommended as periodic medical check-up program in hospital.
Keywords: Occupational stress, psychopathology, nurses, COVID-19

Abstrak

Pendahuluan: *Stres kerja merupakan salah satu faktor yang sering ditemukan pada profesi perawat. Stres kerja dapat memengaruhi baik fisik maupun mental perawat. Pandemi COVID-19 saat ini juga memberikan dampak tambahan beban kerja bagi pekerja sektor kesehatan, termasuk perawat. Studi ini ditujukan untuk menganalisis hubungan antara stres kerja dan gejala psikopatologi pada perawat di Rumah Sakit Kardiovaskular selama masa pandemic COVID-19.*
Metode*: Studi ini merupakan studi potong lintang yang melibatkan 108 perawat di Rumah Sakit Kardiovaskular X. Sampel diambil secara acak sederhana dengan menggunakan kriteria inklusi dan eksklusi. Stres kerja dinilai menggunakan Expanded Nursing Stress Scale (ENSS) dan gejala psikopatologi dinilai berdasarkan Symptom Checklist 90 (SCL-90).*
Hasil*: Rerata skor total ENSS adalah 88,17 ± 32,24 (skor maksimum dari ENSS adalah 228). Sebanyak 19,4% perawat diketahui memiliki gejala psikopatologi. Gejala psikopatologi seperti somatisasi, obsesif-kompulsif, dan psikotisim memiliki nilai t-score yang lebih tinggi dibandingkan dengan subskala gejala psikopatologi lainnya. Terdapat hubungan yang kuat dan bermakna antara stres kerja dan gejala psikopatologi pada perawat ($p<0,001$).*
Simpulan*: Studi ini sangat merekomendasikan diagnosis dini dan tata laksana untuk gejala psikopatologi pada perawat. Evaluasi stres kerja dan gejala psikopatologi pada perawat direkomendasikan untuk dimasukkan ke dalam program pemeriksaan kesehatan berkala perawat di rumah sakit.*
Kata kunci*: stres kerja, gejala psikopatologi, perawat, COVID-19*

Introduction

Nurses are vulnerable to face various occupational stressors. Nurses work in a complex and competitive environment as they are taking more responsibility for caring for patients and communities. Nurses who work in a cardiovascular hospital setting also have additional responsibilities to provide certain emergency actions and rapid decisions, due to unstable patients' cases.[1] Desima et al[2] showed that 61,9% of nurses experienced moderate stress.

An unprecedented outbreak of the novel coronavirus disease (COVID-19) has presented a big challenge to healthcare systems across the globe. The rapid spread of the disease caught many healthcare systems off guard and scrambled to provide intensive care unit beds, ventilators, and Personal Protective Equipment (PPE) for both healthcare workers and patients. Nurses must face conditions that threaten their health, well-being, and ability to perform their jobs. This combination of physical and emotional strain on an already stressed nursing workforce has become a hallmark of the COVID-19 pandemic.[3,4] A previous study about psychological responses among Indonesian nurses during the COVID-19 pandemic showed that 6,5% of nurses had moderate stress, 23,7% had moderate anxiety, and 8,8% had moderate depression. It is also known that anxiety, stress, and depression were significantly higher among nursing staff in the emergency department and COVID-19 isolation ward.[5]

Empirical studies have shown that occupational stress not only impairs nurses' both physical and mental health but is also a risk factor for patient safety and nursing quality. Previous studies indicated that nurses with increased occupational stress had a higher risk of psychopathological symptoms, including depression and anxiety.[6,7] Another study also showed the association of development psychosomatic symptoms like lower back pain, headache, and appetite loss.[8]

Several researchers have focused on occupational stress hazards (e.g., job control, social support, family-work balance, workload, and coping styles)[9-11]; however, few studies focused on the associations between the subdimensions of occupational stress and psychopathological symptoms among nurses in Indonesia. In addition, during the COVID-19 pandemic, several studies have been published to investigate stress on healthcare workers. There is no specific study about the association between occupational stress and psychopathological symptoms among nurses, as well as in the cardiovascular hospital setting. Therefore, this study aimed to identify the association between occupational stress and psychopathological symptoms among nurses in the cardiovascular hospital.

Methods

This was a cross-sectional study conducted from April to June 2021 (at the beginning of COVID-19 second wave in Indonesia) at Cardiovascular Hospital X in Jakarta. This hospital has become a referral hospital for COVID-19 cases besides its role in for caring cardiovascular patients. The sample size was calculated by using the formula for testing the hypothesis on the mean of two unpaired populations. A total of 120 participants were included using simple random sampling with inclusion criteria: agree to become the subject of this study, work in the same unit for at least 1 year. This study did not apply any exclusion criteria. Of 120 participants invited, only 108 participants responded and filled the questionnaire. This study was approved by the Health Research Ethics Committee, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia (KET-532/UN2.F1/ETIK/PPM.00.02/2020) and the ethics committee from hospital X (LB.01.02/VII/KEP 090-2020/2021).

An invitation link was given to the potential participants who met the criteria via WhatsApp (WhatsApp Inc., USA). After obtaining informed consent, the Expanded Nursing Stress Scale (ENSS), a self-reporting questionnaire consisting of 57 questions about nurses' occupational stressors, was given in Indonesian. The questionnaire passed the validity and reliability tests with an index of item objective congruence of 0,939 and a Cronbach's alpha score of 0,956, respectively.12 The stressors included death and dying, conflict with physicians, inadequate preparation, problems with peers, problems with supervisors, workload, uncertainty concerning treatment, patients and their families, and discrimination. Each question was given a score of 0 for 'does not apply', 1 for 'never stressful', 2 for 'occasionally stressful', 3 for 'frequently stressful', and 4 for 'extremely stressful'. Occupational stress was presented by the mean and standard deviation of the ENSS total score. An increase in the ENSS score shows more stress on subjects.

After that, participants continued to answer the psychopathological assessment questionnaire by using Symptom Checklist (SCL) 90, which consists of 90 questions, also given in Indonesian. Psychopathological subscales included depression, anxiety, somatization, obsessive-compulsive, interpersonal sensitivity, hostility, phobic anxiety, paranoid ideation, psychoticism, and additional symptoms (sleep and eating problems). Each question was given a score of 0 for 'not at all', 1 for 'a little bit', 2 for 'moderately', 3 for 'quite a bit', and 4 for 'extremely'. The questionnaire can assess overall psychological symptoms and psychological symptoms for each subscale. Total score from subjects (raw score) converted to t-score based on SCL-90 t-score conversion table. T-score ≥61 indicated that the subject had psychopathological symptoms. This questionnaire also had been validated in Indonesian with sensitivity 82,92%, specificity 83%, positive predictive value 80,00%, and negative predictive value 84,69%. The reliability test showed good results with an r total = 0,67.[13]

Data were analyzed using SPSS software version 24 (IBM Corp., USA) (licensed by Universitas Indonesia). Frequencies (n) and percentages (%) were presented for categorical variables, and continuous variables were computed using the mean and standard deviation. Subjects were divided into two groups: those who have psychopathological symptoms and those who do not have. The association between occupational stress and psychopathological symptoms was evaluated by performing an independent t-test. Sociodemographic items such as age, gender, education, work experience, job position, and hospital units were also included in the analysis. We divided hospital units into critical care units (intensive cardiac care unit, intensive care unit, COVID-19 intensive care, operating room, catheterization lab, and intermediate ward) and non-critical care units (inpatient and outpatient). For the nominal variables, data were evaluated by using chi-square or fisher's exact test. For the numeric variables, data were evaluated by using an independent t-test.

Results

Total of 108 nurses participated in this study. Their characteristics are shown in Table 1. The average age of subjects was 38,69 ± 5,93, mostly female, bachelor/Ners, working as staff, with >5 years work experience, and working in the critical care unit.

Table 1. Subjects Characteristic and Psychopathological Symptoms

Variable	All subjects (N=108)	Psychopathology		p-value
		Psychopathological symptoms (N=21)	Non-psychopathological symptoms (N=87)	
Age (years)*, mean ± SD	38,69 ± 5,93	38,57 ± 5,35	38,72 ± 6,09	0,916
Gender†, n(%)				
Male	24 (22,2)	4 (19,0%)	20 (23,3%)	1,000
Female	84 (77,8)	17 (81,0%)	67 (77,0%)	
Education‡, n(%)				
Diploma III	30 (27,8)	5 (23,8%)	25 (28,7%)	
Bachelor/Ners	75 (69,4)	16 (76,2%)	59 (67,8%)	0,651
Magister	3 (2,8)	0 (0,0%)	3 (2,8%)	
Job position†, n(%)				
Leader	13 (12,0)	3 (14,3%)	10 (11,5%)	0,714
Staff	95 (88,0)	18 (85,7%)	77 (88,5%)	
Work experience†, n(%)				
1-5 years	27 (25,0)	8 (38,1%)	19 (21,8%)	0,123
>5 years	81 (75,0)	13 (61,9%)	68 (78,2%)	
Hospital Unit†, n(%)				
Critical Care	71 (65,7%)	17 (81,0%)	54 (62,1%)	0,102
Non-Critical Care	37 (34,3%)	4 (19,0%)	33 (37,9%)	

*Independent t-test; †fisher's exact test; ‡chi-square test

This study reported that there was no association between subjects' characteristics and psychopathological symptoms. Based on job demographic, psychopathological symptoms had no significant difference between nurses in the critical care unit and non-critical care unit. There were 19,4% nurses had psychopathological symptoms. Somatization had the highest t-score SCL-90 overall, followed by obsessive-compulsive and psychoticism. Psychopathological symptoms profile based on hospital unit is shown in Figure 1.

Overall ENSS mean score for occupational stress is 88,2 ± 32,2. Workload and uncertainty concerning treatment were more frequently answered by scores 3 and 4 than other subscales. When each subscale's maximum score was divided by mean value, those subscales also were the highest. The frequencies for scores 3 and 4 as well as the mean value for ENSS subscales is shown in Table 2, while the sssociation between occupational stress and psychopathological symptoms were strongly significant with a mean difference of 30,4 (15,9-44,9) as shown in Table 3.

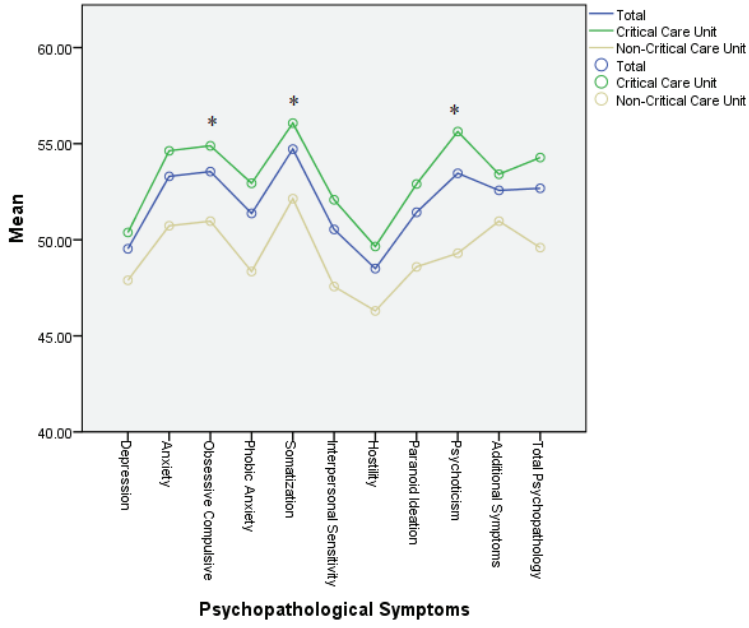

Figure 1. Psychopathological Symptoms Profile among Subjects.
*Indicated Highest Scl-90 T-Score than Other Subscales.

Table 2. Respondents Frequencies For Score 3 And 4 Based On Enss Subscales

ENSS Subscale	Score 3	Score 4	Total (%)
	Frequently stressful	Extremely stressful	
	n (%)	n (%)	
Death and dying	38 (12,3)	31 (14,6)	69 (13,2)
Conflict with physicians	33 (10,6)	18 (8,5)	51 (9,8)
Inadequate preparation	18 (5,8)	9 (4,2)	27 (5,2)
Problems with peers	23 (7,4)	15 (7,1)	38 (7,3)
Problems with supervisors	41 (13,2)	29 (13,7)	70 (13,4)
Workload	53 (17,1)	33 (15,6)	86 (16,5)
Uncertainty concerning treatments	49 (15,8)	32 (15,1)	81 (15,5)
Patients and their families	44 (14,2)	30 (14,2)	74 (14,2)
Discrimination	11 (3,5)	15 (7,1)	26 (4,9)

Table 3. Association between Occupational Stress and Psychopathological Symptoms

Variable (ENSS Subscale)	Max score	All subjects (N=108)	Psychopathology		p-value*	Mean diff (95% CI)
			Psychopathological symptoms (n= 21)	Non-psychopathological symptoms (n=87)		
Death and dying	28	11,5 ± 4,3	14,0 ± 3,3	10,9 ± 4,2	0,002	3,1 (1,2-5,2)
Conflict with physicians	20	7,6 ± 4,3	10,7 ± 2,8	6,8 ± 3,2	<0,001	3,9 (2,4-5,4)
Inadequate preparation	12	4,4 ± 2,3	6,1 ± 2,3	4,0 ± 2,1	<0,001	2,1 (1,0-3,1)
Problems with peers	24	7,2 ± 4,1	9,2 ± 4,2	6,7 ± 3,9	0,011	2,5 (0,6-4,4)
Problems with supervisors	28	11,3 ± 5,4	14,3 ± 5,1	10,6 ± 5,3	0,004	3,7 (1,2-6,2)
Workload	36	15,7 ± 5,9	18,9 ± 4,8	14,9 ± 5,9	0,005	4,0 (1,2-6,7)
Uncertainty concerning treatments	36	16,1 ± 5,4	19,4 ± 4,3	15,3 ± 5,4	0,001	4,1 (1,7-6,7)
Patients and their families	32	12,3 ± 6,1	16,5 ± 5,7	11,3 ± 5,8	<0,001	5,2 (2,4-7,9)
Discrimination	12	2,2 ± 2,7	3,5 ± 3,4	1,8 ± 2,4	0,040	1,7 (0,4-3,0)
ENSS	228	88,2 ± 32,2	112,7 ± 27,4	82,3 ± 30,6	<0,001	30,4 (15,9-44,9)

*Using independent t-test, with significant value (p<0,05)

Discussion

Surilena et al[7] found 22,8% of inpatient and outpatient care nurses had psychopathological symptoms. That study was conducted in 2015, before the pandemic, at the general hospital in Jakarta. Whereas, in this study, we found that psychopathological symptoms among nurses were slightly lower (19,4%). However, it is still high when compared to the total population.

That slightly lower percentage could probably be affected by several things that have been done by the hospital in terms of mental health control. Nurses had to pass recruitment exams before being able to work at this hospital, including psychological tests such as Minnesota Multiphasic Personality Inventory (MMPI) to assess personality and psychopathological symptoms. It is expected that nurses who work in this hospital have a strong personality to overcome problems and stable psychological conditions. However, the COVID-19 pandemic has brought other challenges for healthcare workers, including nurses, so there can be more unpredictable and complex stressors. This uncertain situation, both from the workplace and individual, could probably as one of the factors contributing to the psychopathological symptoms found among nurses.

Somatization had the highest mean of t-score SCL-90. Headache and muscle pain were the most frequent finding among scores 3 and 4. Similar to this study, Wozniak et al[14] found that somatization symptoms that were commonly found among nurses during the COVID-19 pandemic were muscle pain, back pain, headache, and lightheadedness. An observational survey of medical staff reported that somatization among nurses could cause by wearing heavy protective clothing and work continuously in the contaminated area almost every day.[15]

Psychoticism subscale was the second-highest t-score among SCL-90 subscales. It was also found higher in critical care units. Within the psychoticism subscale, 9 subjects answered about having an idea that he/she should be punished for his/her sins. Occupational stress can contribute to the finding as stress has known

to elevate dopamine levels which can be expressed behaviorally as psychoticism.[16] Along with this result, the COVID-19 pandemic has brought unbearable psychological pressure, as more complex patients' cases found. Nurses could feel guilt and sins or often self-blaming when there is a therapeutic failure. Self-blaming is known to be one of the factors that lead to depression, while depression is strongly associated with psychoticism.[16] Nonetheless, this finding could also be affected by individual factors among nurses. Further assessment is needed regarding this result.

This study also found that obsessive-compulsive also had higher t-score values than other SCL-90 subscales. Subjects often answered with a score of 3 and 4 within this question, worried about sloppiness or carelessness. Nurses oversee doing the best nursing care for patients. Moreover, while working in a cardiovascular hospital setting, dealing with critical and unstable patients who can have a cardiac arrest at any time, will make nurses worried about being careless. COVID-19 pandemic not only gives additional stressors but also increases the job demand of nurses. Ergenc et al[17] also found that obsessive-compulsive was higher among the COVID-19 isolation ward than in the control group.

There was no association between subjects' characteristics and psychopathological symptoms. This result could be related to individual factors affecting the psychological outcome, such as personality type, locus of control, and coping mechanism strategies. Furthermore, nurses who work in critical care units and the non-critical unit did not have significant differences in psychopathological symptoms. Although the critical care unit is commonly associated with more complex situations, nurses who work in the critical unit are known to have more experiences and skills, so it is assumed they are stronger while facing complex problems.

Occupational stress among nurses was measured by using an ENSS questionnaire which consists of 9 nurses' specific occupational stressors. The greater the score of ENSS means a higher level of stress experienced by the nurses. Our study found that the total mean score was relatively low since the mean score of occupational stress among nurses did not achieve 50% of the ENSS total score, i.e. when each item in the questionnaire got a score of 4. Salmawati et al18 found that the low occupational stress among nurses can be associated with the employee status, especially when nurses are civil servants. It is assumed that civil servants feel more secure, as they receive a salary every month. Several previous studies in Indonesia also showed similar findings.[19,20] Although, when compared to Wardhani19, which found a mean ENSS score of 83,00 ± 33,42, our study was higher. This finding could be related to the different subjects' characteristics in the study. Wardhani[19] evaluated occupational stress among inpatient and outpatient care in a general hospital setting, while this study was evaluated in a cardiovascular hospital setting including the critical and non-critical care units.

This study showed that uncertainty concerning treatment and workload were more stressful situations than other ENSS subscales. These findings were similar to previous studies.[19,21] Based on subjects' answers for uncertainty concerning treatment, we found that the most stressful situations were being exposed to hazards and fear of making a mistake. Nurses, particularly cardiovascular nurses, can be exposed to several health and safety hazards. A previous study showed the highest level of an occupational hazard among nurses was at the time of infusion insertion, such as the risk of needle stick injury, exposure to blood, incorrect posture, exposure to viral hepatitis, and low back pain.[22] In particular, the COVID-19 pandemic surely brought an uncertain situation, both for the patients' treatment and nurses' health. The risk of COVID-19 infection is also one of the biggest fears among nurses, as their new workplace hazard. Related to the patients' care, nurses also often being blamed if there is a mistake, especially when rapid treatment is needed but doctors not on the ward or communication are not going well. During the COVID-19 pandemic, this situation can also happen anytime since both nurses and doctors face uncertainty regarding patients' treatment.

Stressful situations among subjects related to workload were not enough staff in the unit and too many non-nursing tasks. The number of nursing staff should always be by the workload to produce effective and efficient services. Whereas, in practice, in order not to affect the service, the lacking number of nursing staff must be compensated by increasing the workload.[21] This will certainly have an impact on a higher workload and cause occupational stress.

Nurses also often deal with administrative work, for example writing medical records, patient forms, and others. In addition, subjects are also faced with the transition of the medical record system from handwritten to electronic medical records, while not all of them are electronically integrated. This requires

nurses to do the job twice, to write and type medical records. As an internationally accredited hospital, nurses who work in this hospital also contribute to doing some administrative work related to accreditation documents.

During the COVID-19 pandemic, cardiovascular hospital X applied rotation for nurses to work in the COVID-19 isolation ward. Therefore, there was a reduction in the number of human resources in some hospital units. In addition, there were also positive COVID-19 cases among nurses which can cause fewer active nurses. The previous study, showed that several factors can affect nurses' mental health outcomes during a COVID-19 pandemic, such as workload or job changes, lack of work experience in the COVID-19 isolation room, want to resign from caring for COVID-19 patients, and fear of going home regarding the spread of COVID-19 infection for family members.[23] This study reported that occupational stress was associated with psychopathological symptoms. This result was like the findings of several studies that showed an association between occupational stress and psychopathological symptoms.[3,6] From a previous study, occupational stressors such as role ambiguity, role conflict, quantitative overload work, qualitative overload work, career development, and personal responsibility had a significant impact on the tendency of mental health problems among nurses.[6]

Healthcare workers, including nurses, tend to have maladaptively focused on problem coping mechanisms. They are more likely to avoid the problems, which lead to the development of mental health problems. Hasan et al[24] also showed an association between maladaptive coping mechanisms and occupational stress, as well as higher occupational stress leading to depression. However, factors related to coping mechanisms or mediating factors to psychopathological symptoms were not analyzed in this study.

According to the mean difference between occupational stressors and psychopathological symptoms, the highest mean difference among ENSS subscales was patients and their families. Nurses who had a high score in patients and their families' stressors were more likely to have psychopathological symptoms than other stressors. The most stressful situations were having to deal with a rude patient and being blamed for every mistake. Nurses often deal with various characteristics of patients or their families. If there are more complex or critical cases, usually the family has a lot of demands regarding the patient's treatment. This can potentially trigger rude or abusive behavior, both verbally and actions that occur to nurses. Along with this study, regulations for hospital accreditation are also concerned about this situation. Therefore, in every hospital, there must be socialization for patients and families about respecting hospital employees and nurses, as well as follow-up action for any intimidation or violence both physical and mental.

There were several limitations to this study. This study did not precisely exclude any existing mental health problems, for example, mood disorders among participants, as we did not give the specific screening for participants. This study also did not include any mediating factors for psychopathological symptoms development, for example, coping mechanisms. However, this study used ENSS, a specific instrument for assessing occupational stress in nurses, and SCL-90 which had 10 subdimensions of psychopathological symptoms. This study had minimized recall bias by using those two instruments, as the instruments had good reliability tests.

Future studies are needed to evaluate mediating factors that can affect psychopathological symptoms, as well as occupational stress management strategy as the potential alternative to prevent psychopathological symptoms. Moreover, future research assessing occupational stress and psychopathological symptoms after the COVID-19 pandemic is suggested.

In conclusion, this study reported that the association between occupational stress and psychopathological symptoms among cardiovascular nurses was strongly significant. The finding suggested that higher ENSS scores were found in nurses who had psychopathological symptoms. Stress alleviation is likewise a key component to prevent the development of psychopathological symptoms. Early diagnosis and prompt treatment for psychopathological symptoms among nurses are highly recommended to be done in the hospital. Evaluation of occupational stress and psychopathological symptoms is recommended as a periodic medical check-up at the hospital. Mental health education and training like mindfulness training for the nurses are also suggested. Assessment for coping mechanisms among nurses also can be considered to give occupational doctors clues for specific interventions.

Conflicts of Interest

There is no conflict of interest.

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