

The Effect of COVID-19-related Occupational Stress and Burnout in Referral Hospital Nurses

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Abstract

Nurses' continuous contribution to patient health makes them prone to occupational stress, which has been exacerbated during the COVID-19 pandemic. Occupational stress that lasts for a long time and is not resolved may cause burnout. Burnout experienced by nurses can impact patients, hospital services, and themselves. This study aimed to determine the effect of occupational stress on the incidence of nurse burnout during the COVID-19 pandemic. It used a quantitative approach with a cross-sectional design. The study sample was 235 nurses in six COVID-19 referral hospitals in West Sumatra from a proportional random sampling technique. Data were collected using a digital questionnaire distributed via a Google Forms link from February to April 2022. The results showed that the stress level of nurses was most commonly moderate (68.1%), and the burnout level was most commonly low (82.1%), with a significant effect of occupational stress on burnout. This study revealed the effect of occupational stress on the burnout of nurses treating COVID-19 patients.

Keywords: burnout, COVID-19, nurses, occupational stress

Introduction

The large increase in hospital coronavirus disease 2019 (COVID-19) cases and many health workers died of COVID-19 have directly impacted nurses, both physically and mentally.¹ The physical impacts experienced by health workers have included fever (85%), cough (80%), weakness (70%), chest pain (7%), hemophilia (7%), headache (7%), and diarrhea (7%).^{2,3} Common psychological impacts are symptoms of depression, anxiety, fear, insomnia, and stress.⁴ Up to 75.2% of nurses working in one of Egypt's COVID-19 specialist hospitals reported experiencing stress.⁵ According to an online survey by the American Nurses Association, 82% of US nurses reported feeling stress at work during the COVID-19 pandemic.⁶ COVID-19-related stress has affected 55% of health workers in Indonesia.⁷ As a result, nurses experience high stress levels due to the pandemic.

Recent study have investigated the impact of occupational stress among nurses, showing a significant relationship with burnout.⁸ Such extreme changes in the working environment and the complexity of this new disease have left nurses feeling uncertainty and fear. The

staggering changes in nurses' situations during this crisis must be acknowledged and documented. Examining burnout during the health crisis is necessary to manage future strategies to decrease the negative outcomes of such situations. Most studies have determined that occupational stress affect burnout in only non-COVID-19 survivors.⁵ This study broadened the analysis to nurses who had experienced COVID-19 as individuals or were known COVID-19 survivors. It examined the differences in occupational stress and burnout in nurses who were survivors of COVID-19 or had not been infected.

Nurses experiencing COVID-19-related occupational stress need immediate serious help as the major factor causing occupational stress for nurses handling these patients is the perception that COVID-19 is negative and dangerous.⁹ This anxiety about danger positively correlates with individual stress and worry.¹⁰ If left unchecked, it may affect the nurse's mentality, quality of work, and patient safety, such as increasing the risk of procedural error that results in disability or death of the patient.¹⁰ Hence, fast and appropriate handling of nurses' occupational stress may prevent losses for indivi-

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dual nurses, hospitals, and patients.

The continuous occupational stress faced by nurses as frontline health workers during the COVID-19 pandemic has the potential to cause burnout. Burnout syndrome occurs when a person has high and unresolved occupational stress, resulting in physical and mental fatigue and boredom.¹¹ Jobs that trigger stress continuously until it accumulates can make a person burned out.¹² Burnout among nurses in Indonesia has not only occurred during the COVID-19 pandemic. Arisani, Arif, and Wijaya reported in 2019 that 49.1% of nurses working at public hospitals experienced burnout, and 47.2% of burnout occurred in nurses working at private hospitals.¹³ Therefore, even in normal situations without high occupational stress, burnout has already become a serious problem in nursing.

Under the situation worsening during the pandemic, nurses in Indonesia have encountered an additional workload to respond to this distinct and complex condition. The rapid changes in regulations and working environment policies have also confused nurses and challenged their adaptability and resilience. Irregular staff circulation and replacement due to COVID-19 infection have also complicated the situation. This situation may decrease the quality of nursing care due to nurses experiencing physical fatigue, stress, insomnia, depression, and irritability.⁹ During the COVID-19 pandemic, when healthcare providers must deal with a high workload, burnout may occur and escalate.¹⁴

A survey by the Indonesia National Nurses Association, found that 60% of nurses experienced burnout, depression, and anxiety.¹⁵ A study in Wuhan, China, found that half of the nurses (n = 600) experienced moderate or high burnout.¹⁶ In another study of 376 healthcare professionals in Italy, 1 in 3 people scored the highest for burnout.¹⁷ Another study found high burnout in 51% of participants.¹⁸ Burnout has a significant direct and indirect effect on willingness to leave nursing often referred to as turnover intention. Hospitals' limitations have resulted in the inability of nurses and other healthcare providers to be protected from stress while dealing with COVID-19. Neglecting this issue affects nurses' fatigue, which can negatively impact hospital performance.¹⁹ This study aimed to examine the characteristics of nurses in each hospital, determine their level of occupational stress and burnout, relate these to demographic characteristics and investigate the effect of occupational stress on burnout in nurses providing services to COVID-19 patients. The novel contribution of this study was showing how occupational stress and burnout are represented in nurses who have been survivors of COVID-19 versus those who have not been infected.

Method

This study used a cross-sectional design, and its sampling method used a proportional random sampling technique. The reason for selecting this cross-sectional design was to collect data from many participants and compare the different characteristics of each participant at the same time. The participants were nurses treating COVID-19 patients. The study locations were six COVID-19 referral hospitals in the West Sumatra Province, Indonesia, based on the decrees of the Minister of Health of the Republic of Indonesia and the Governor of West Sumatra.²⁰ The total population was 412 nurses. The sample was calculated using the Lemeshow formula for estimating the population proportion, which gave a sample of 235.

The data were collected from February to April 2022 using the Occupational Stress Inventory–Revised Edition (OSI-R™) questionnaire and the Maslach Burnout Inventory (MBI) questionnaire. The questionnaires were distributed using a Google Forms link via WhatsApp. The demographic data collected were age, sex, education, employment status, length of work as a COVID-19 nurse, length of work as nurse, marital status, children, and records of COVID-19 infection. The nurses' stress was measured using the OSI-R™ questionnaire translated into the Indonesian language. This questionnaire consisted of 25 indicator variables of occupational stress, each with a score of 1–5. The total score was classified as low, moderate, or high. The nurses' burnout was measured using the MBI questionnaire translated into the Indonesian language. This questionnaire consisted of 22 indicator variables of burnout with answer options of never, rarely, often, and always. The total score was classified as low, moderate, or high. The validity and reliability tests were conducted on 30 nurses at different hospitals, using Cronbach's alpha. The test results showed that both questionnaires used were valid and reliable, with values of 0.91 and 0.93. Following approval by each hospital, the study process was then explained to the heads of the installation and the hospital ward.

This study had an independent variable (occupational stress) and dependent variable (burnout). The independent and dependent variable data were based on the experience and judgment of the participants when treating COVID-19 patients. Because the data were not collected at the start of the pandemic, the participants' answers were not representative of the actual situation, and bias could occur. The demographic data describing participants' characteristics (age, sex, education, employment status, working period as a COVID-19 nurse, working period as nurse, marital status, children, and records of COVID-19 infection) were analyzed descriptively, and the crosstab analysis of the characteristics of

each variable and each hospital were performed.

The crosstab analysis was presented as frequency and percentage. The effect of stress on burnout was analyzed using inferential statistics (structural equation model–partial least square; (SEM-PLS)). The SEM-PLS analyzes the significance level and the relationship between variables and aims to maximize the variance explanation of the dependent variable and minimize unexplained variables. The advantages of this method included that the normality of the data distribution was not assumed; data can be analyzed by SEM because the application method was non-parametrical. The data analysis steps using SEM-PLS were:

1. Designing a structural model or inner model.
The inner model is a structural model to predict causality relationships between latent variables.
2. Designing a measurement model or outer model.
This model specifies the relationship between latent variables and their indicators. The outer model defines how each indicator relates to its latent variables and aims to assess its validity and reliability.
3. Outer model evaluation using convergent validity, discriminant validity, and composite reliability.
In the evaluation, the convergent validity could be

assessed based on the correlation between the component score (item score or component score) and the value of the counter; in other words, it could be judged based on the loading factor. A correlation meets convergent validity if it has a larger loading value, from 0.5 to 0.6. The evaluation of the discriminant can be assessed based on validity, comparing the square root value of the average variance extracted (AVE). If the AVE value is greater than the correlation value between latent variables, then the discriminant validity could be considered fulfilled. The validity of the discriminant is achieved if the AVE value is greater than 0.5. The evaluation of composite reliability is based on a composite reliability value greater than 0.7 and a Cronbach's alpha value greater than 0.7.

4. Inner model evaluation using path coefficient, R^2 , and hypothesis testing.²¹

The value of R^2 was used to measure how much influence the independent latent variables have on latent dependent variables. A result of $R^2 = 0.67$ indicated that the model was good, and a higher value of R^2 means a better prediction model. This measurement was used to determine the magnitude of the

Table 1. Demographic Characteristics and Distribution of Participant (n = 235)

Variable	Category	The Hospital's											
		1 (n = 102)		2 (n = 54)		3 (n = 30)		4 (n = 19)		5 (n = 13)		6 (n = 17)	
		n	%	n	%	n	%	n	%	n	%	n	%
Age (years)	17–25	2	2.0	2	3.7	9	30	0	0	1	7.7	1	5.9
	26–35	58	59.6	37	68.5	17	56.7	12	63.2	10	76.9	11	64.7
	36–45	41	40.2	15	27.8	4	13.3	7	36.8	2	15.4	5	29.4
	46–55	1	1.0	0	0	0	0	0	0	0	0	0	0
Sex	Male	19	18.6	21	38.9	13	43.3	5	26.3	2	15.4	6	35.3
	Female	83	81.4	17	61.1	17	56.7	14	73.7	11	84.6	11	64.7
Education	Diploma in nursing	62	60.8	15	27.8	9	30	9	47.4	7	53.8	9	52.9
	Bachelor in nursing	40	39.2	39	72.2	21	70	10	52.6	6	46.2	8	47.1
Employment status	Civil servant	53	2	32	59.3	0	0	9	47.4	9	69.2	10	58.8
	Non-civil servant	49	48	22	40.7	30	100	10	52.6	4	30.8	7	41.2
Working period as a COVID-19 nurse (months)	6–12	42	41.2	33	61.1	19	63.3	9	47.4	9	69.2	7	41.2
	13–18	14	13.7	8	14.8	10	33.3	4	21.1	2	15.4	3	17.6
	19–24	46	45.1	13	24.1	1	3.3	6	31.6	2	15.4	7	41.2
Working period as nurse (years)	0–1	7	6.9	7	13.0	14	46.7	1	5.3	2	15.4	0	0
	1–2	5	4.9	8	14.8	3	10	0	0	0	0	0	0
	3–4	12	11.8	5	9.3	4	13.3	1	5.3	0	0	3	0
	>4	78	76.5	34	63.0	9	30	17	89.5	11	84.6	14	82.4
Marital status	Married	95	93.1	44	81.5	9	30	18	94.7	12	92.3	14	82.64
	Single	7	6.9	10	18.5	21	70	1	5.3	1	7.7	3	17.6
Having children	No	19	18.6	13	24.1	21	70	7	36.8	3	23.1	2	11.8
	Yes	85	81.4	41	75.9	9	30	12	63.2	10	76.9	15	88.2
Infected with COVID-19	Yes	61	59.8	9	16.7	21	70	10	52.6	6	46.2	3	17.6
	No	41	40.2	45	83.3	9	30	9	47.4	7	53.8	14	82.4
Occupational stress	Low	22	21.6	16	29.6	3	10.0	4	21.1	0	0	0	0
	Moderate	63	61.8	37	68.5	26	86.7	15	78.9	14	76.9	11	64.7
	High	17	16.7	1	1.9	1	3.3	0	0	3	23.1	6	35.3
Burnout	Low	96	94.1	37	68.5	22	73.3	18	94.7	12	92.3	10	58.8
	Moderate	6	5.9	17	31.5	8	26.7	1	5.3	1	7.7	6	35.3
	High	0	0	0	0	0	0	0	0	0	0	1	5.9

Table 2. Distribution of Occupational Stress and Burnout Based On Participant's Demographic Characteristics (n = 235)

Variable	Category	Occupational Stress (%)			Burnout (%)		
		Low	Moderate	High	Low	Moderate	High
Age (years)	17–25	20	80	0	73.3	26.7	0
	26–35	17	70.7	12.3	81.0	18.3	0.7
	36–45	20.8	59.7	19.5	86.1	13.9	0
	46–55	0	100	0	100	0	0
Sex	Male	21.2	63.6	15.2	69.7	30.3	0
	Female	17.2	69.8	13	87	12.4	0.6
Education	Diploma in nursing	15.9	68.2	15.9	86.7	13.3	0
	Bachelor in nursing	20.5	68	11.5	77.9	21.3	0.8
Employment status	Civil servant	23.5	62.6	13.9	81.7	17.4	0.9
	Non-civil servant	13.3	73.3	13.4	82.5	17.5	0
Work period as a COVID-19 nurse (months)	6–12	18.3	65	16.7	77.5	21.7	0.8
	13–18	7.5	92.5	0	80	20	0
	19–24	24	60	16	90.7	9.30	0
Working period as nurse (years)	0–1	15.6	75	9.40	75	25	0
	1–2	25	68.8	6.20	80	20	0
	3–4	20	68	12	83.3	16	0.7
	>4	17.9	66.7	15.40	82.2	17.4	0.4
Marital status	Married	17.8	66.0	16.2	83.2	16.8	0
	Single	20.5	77.3	2.2	77.3	22.3	0.4
Having children	No	17.9	77.6	4.5	80.6	17.9	1.5
	Yes	18.5	64.2	17.3	82.7	17.3	0
Infected with COVID-19	Yes	14.7	69.7	15.6	87.2	12.8	0
	No	21.4	66.7	11.9	77.8	21.4	0.8

influence, test the hypothesis, and determine the significance level. Hypothesis testing in this study was carried out by examining the t-statistics values and p-values. The study's hypothesis can be accepted if the p-values are less than 0.05. Paths that have a significant influence are based on the t-statistic value; if it is higher than 1.96, it is positive, and if it is 1.96, it is negative.

The data analysis used the free versions of SPSS 23 and Smart PLS software.

Results

This study involved 225 nurses working at six COVID-19 referral hospitals in the West Sumatra Province, Indonesia. Most were aged 26–35 years (62.6%), female (71.9), and attained a bachelor's degree in nursing (51.9%). The most common employment status was a non-civil servant with a working period as a COVID-19 nurse of 6–12 months. Almost all the nurses (81.4%) were married, and 71.5% had children. Of all the nurses, 46.4% had been infected with COVID-19. The occupational stress for nurses was mostly in the moderate category (68.1%), and burnout was mostly (82.1%) in the low category (Table 1).

The nurses experiencing severe occupational stress were mostly aged 36–46 years old, male, civil servants, married, had worked as nurses for more than four years, attained a diploma in nursing, had children, and had been infected with COVID-19. The nurses who experienced

Table 3. Outer Loading Test

Variable	Indicator Variable	Factor Loading	Description
Occupational stress	ST 5	0.724	Fulfilled
	ST 12	0.722	Fulfilled
	ST 14	0.805	Fulfilled
	ST 15	0.852	Fulfilled
	ST 17	0.676	Fulfilled
	ST 20	0.708	Fulfilled
Burnout	BN 4	0.725	Fulfilled
	BN 6	0.675	Fulfilled
	BN 9	0.711	Fulfilled
	BN 15	0.708	Fulfilled
	BN 17	0.649	Fulfilled
	BN 18	0.702	Fulfilled
	BN 19	0.738	Fulfilled
	BN 20	0.765	Fulfilled
	BN 21	0.755	Fulfilled

Notes: ST = Stress, BN = Burnout

high burnout were mostly aged 26–34 years, female, civil servants, attained a bachelor degree in nursing, worked as COVID-19 nurses for 6–12 months, had been nurses for 3–4 years, and had never been infected with COVID-19 (Table 2).

SEM-PLS Analysis

A. Outer Model Analysis

This study examined the outer model by analyzing the values contained in the results of the occupational stress and burnout variable data processing. The outer model was examined using convergent validity, discriminant

validity or AVE, and composite reliability values.

Outer loading was carried out three times because the variable stress and burnout indicators were found invalid. Table 3 and Figure 1 show that all indicators of the stress and burnout variables are valid and ideal as the outer loading values were more than 0.50. The composite reliability test is ideal if the value of the data processing result is ≥ 0.80 .²¹ Cronbach's alpha assessment is valid and ideal if the value of each variable is ≥ 0.70 .²¹ Table 4 shows that the AVE value, composite reliability, and Cronbach's alpha met the predetermined criteria, meaning that the stress and burnout variables in this study were reliable.

B. Inner Model Analysis

The inner model is a structural model for predicting causality relationships between latent variables, evaluating the effect of constructs between latent variables, and testing hypotheses. The structural model is evaluated with the coefficient of determination (R^2), which is a method to assess how much the exogenous construct can explain the endogenous construct in the sense of how much influence the independent variable has on the dependent variable.²¹

Analysis of variance (R^2), or test of determination, was an analysis to determine the influence of the independent variables on the dependent variable. Table 5 shows that the R^2 value of the burnout variable is 0.85. Thus, 85% of the burnout variable could be explained by

the occupational stress variable; the remaining 15% was explained by other variables that were not examined. This measurement was used to determine the magnitude of the influence, test the hypothesis, and determine the significance level. Hypothesis testing in this study was carried out by examining the t-statistic values and p-values. The hypothesis is accepted if the p-value is less than 0.05. Paths that have a significant influence are based on the t-statistic value: if this is >1.96 , it is positive, and if it is <-1.96 , it is negative.

This study hypothesized that stress significantly affected burnout in COVID-19 nurses during the COVID-19 pandemic. Based on Table 5, the original sample was positive, with a value of 0.292. These results indicated that the direction of the relationship between occupational stress and burnout was positive. The mean sample value was 0.305, showing that every 1-unit increase in stress increases burnout by 0.305 times. The significance value was 0.000 (<0.05), and the t-statistic value was 7.092 (>1.96), thus stress had a significant effect on burnout, and the hypothesis was accepted.

Discussion

Most nurses (68.1%) assigned to treat COVID-19 patients at the six referral hospitals in the West Sumatra Province, Indonesia, experienced moderate levels of occupational stress. Previous studies conducted at hospitals dealing with infectious diseases have also shown that nurses experienced moderate occupational stress. A study in Pekanbaru, Banda Aceh, Dumai, and Medan, Indonesia, found that the level of occupational stress experienced by most nurses was moderate.²²⁻²⁴ A study in Wuhan, China, found that less than 60% of health workers, predominantly nurses, felt moderate or severe stress while caring for patients with COVID-19.¹⁵ This moderate occupational stress experienced by nurses is a form of increasing awareness of COVID-19 exposure in

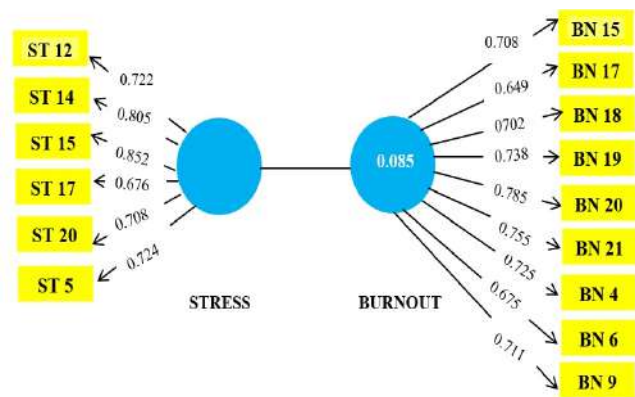


Figure 1. Result of the Structural Model of Occupational Stress and Burnout

Table 4. Average Variance Extracted Score, Composite Reliability, and Cronbach's Alpha

Variable	Cronbach's alpha	Composite Reliability	AVE
Occupational stress	0.890	0.905	0.515
Burnout	0.845	0.885	0.563

Note: AVE = Average Variance Extracted

Table 5. R2 Value Results and Hypothesis Testing

R2 Value Result			Hypothesis Testing						
Variable	R2	R2 adjusted	Hypothesis	Original Sample	Mean Sample	SD	t-statistic	p-value	Description
Burnout	0.85	0.82	Occupational stress affects burnout	0.292	0.305	0.041	7.092	0.000	Data support the hypothesis

Note: SD = Standard Deviation

the work environment. It is also caused by insufficient information and support in completing nursing work.²⁵

The demographic characteristics of nurses also affected their occupational stress. Most nurses in this study were aged 26–35 years. According to previous studies, the average age for experiencing occupational stress is 30 years.²⁶ The majority of COVID-19 nurses in this study were females, and their stress levels were higher than those of males. Women have a higher risk than men of experiencing stress because they have the main family caregiver role and are vulnerable to social isolation.²⁷ A previous study reported that women are more vulnerable to stress because they have a higher stress response system, and working women face role conflicts as workers and housewives, coupled with the job's demands.²⁸ The cross-tabulation results showed that the rate of moderate occupational stress among nurses was not much different between diploma three graduates (68.1%) and bachelor's degree graduates (68%). Most COVID-19 nurses working in the COVID-19 room for 6–12 months (65%) experienced moderate stress levels.

Occupational stress experienced for a long time without stopping due to COVID-19 can trigger complications such as decreased performance, depression, burnout, and the desire to stop working.²⁹ Unmanaged occupational stress may cause emotional exhaustion, cynicism, and decreased achievement.²⁹ Social workers such as health workers, especially nurses, are vulnerable to experiencing pressure due to the COVID-19 pandemic because they must provide professional services to patients in critical and difficult conditions.³⁰ Nurses, as the front line handling COVID-19, are most at risk of experiencing burnout.³¹

The majority of burnout experienced by the nurses at the six COVID-19 referral hospitals in the West Sumatra Province, Indonesia, was low. Similar studies were conducted at three hospitals in Mataram and one in Surabaya, Indonesia, where 62.4% and 69% of nurses experienced low burnout.^{32,33} It means that most nurses during the COVID-19 pandemic have remained able to control fatigue and overcome stressors which could affect performance.

However, other studies show that during the COVID-19 pandemic, nurses have experienced burnout, depersonalization dimensions, and decreased self-esteem.³⁴ In this study, 18.4% of nurses aged 26–35 years experienced moderate burnout, as did 12.4% of women. Female nurses showed a greater incidence of burnout than male because women are more prone to experiencing emotional exhaustion.³⁵ A previous study has reported that sex is related to burnout in health workers.³⁶ This result is in line with a study in Portugal, finding that female had an average burnout 4.52 times higher than male.³⁷

Nurses who are married and have children also potentially to experience burnout.³⁸ Another study has reported that marital status is related to burnout.³⁹ This study's cross-tabulation of the demographic table results found that 16.8% of COVID-19 nurses who were married and 17.3% of those with children experienced moderate burnout.

Work experience is associated with burnout in health workers.^{16,36} Burnout does not follow a specific working period. However, the longer the individual's working period, the more experienced they are in carrying out their duties, and the more boredom occurs due to monotonous work. The new findings in this study were that heavy occupational stress occurred more frequently in nurses who had been infected with COVID-19 compared to nurses who had not. Still, the highest burnout incidence (0.8%) occurred in the latter. Almost all the nurses who were survivors of COVID-19 (87.2%) experienced low burnout.

The mean sample value in this study was 0.305, with a significance value of 0.000 (<0.05) and a statistical t-value of 7.092 (>t-table 1.645), so that occupational stress had a significant effect on burnout. The result was similar to a study by Agustina, *et al.*, that found that occupational stress had a significant effect on nurse burnout.⁸ Another study found a relationship between occupational stress and burnout during the COVID-19 pandemic, in which the higher the occupational stress, the more likely burnout would occur.⁷

However, the results of this study showed that the effect of occupational stress on burnout for COVID-19 nurses was low. Another study shared the same result and reported that nurses working under stressful conditions for a short time do not necessarily suffer from burnout.⁴⁰ It means that if the occupational stress of nurses is not handled immediately, they may experience burnout.²⁶ These findings can be used as a basis for hospital policymakers in managing health resources in dealing with crises such as COVID-19. The appropriate policy will make it easy for hospitals to overcome the consequences of a health crisis such as COVID-19 so that the mental health of nurses can be maintained, nurses can improve their work performance, and the prolonged effects of stress and burnout cannot occur.

The strength of this study was that it used SEM-PLS, as a growing model, for direct and indirect data analysis. The limitation of the study was participants from several hospitals faced job transfers during the pandemic. This condition could have led to bias by affecting participants' real-time situation of burnout and occupational stress, and it was important for them to remember the relevant situation. To minimize bias, nurses were instructed to complete the questionnaire based on the situation while treating COVID-19 patients.

Conclusion

The effect of occupational stress on the burnout of nurses caring for COVID-19 patients at six referral hospitals. The occupational stress and burnout level of nurses is moderate and low, respectively. Hospital management must address this crucial situation during a health crisis and arrange possible strategies to deal with occupational stress, which will prevent negative outcomes such as burnout and turnover.

Abbreviations

COVID-19: coronavirus disease 2019; OSI-RTM: Occupational Stress Inventory-Revised Edition; MBI: Maslach Burnout Inventory; SEM-PLS: Structural Equation Model-Partial Least Square; AVE: Average Variance Extracted.

Ethics Approval and Consent to Participate

This research was assessed by the Ethics Committee of RSUP Dr. M. Djamil Padang (number: LB.02.02/5.7/94/2022). The test carried out fulfilled the established criteria. The criteria include explaining the benefits of research, explaining the rights of respondents, protecting the privacy of respondents, upholding aspects of fairness, and upholding the principle of openness by explaining research procedures and informed consent. Written informed consent was given to participate.

Competing Interest

The authors declare that there are no significant competing financial, professional, or personal interests that might have affected the performance or presentation of the work described in this manuscript.

Availability of Data and Materials

Data and materials are available for sharing according to procedures and regulations.

Authors' Contribution

YA and MF designed the study, collected samples, conducted quantitative data analyses, and drafted the manuscript. YA gave feedback and revised the manuscript. All authors read and approved the final manuscript.

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