# Perceived Stress and Intention to Work during the COVID-19 Pandemic among Nurses in West Sumatra Indonesia

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## Abstract

**BACKGROUND:** Nurses are at high risk of experiencing stress when treating patients with COVID-19. The presence of an outbreak could also result in burnout among nurses due to job stress, poor hospital resources for the treatment, and inadequate support from family and friends. All of these related obstacles might be interfered with the intention of nurses to work during a pandemic.

**AIM:** The objective of the study was to identify perceived stress and intention to work during the COVID-19 pandemic among nurses.

**METHODS:** An online-based cross-sectional study was conducted among nurses in Indonesia. There were 238 responses received. Multiple regression analysis was used to examine for data analysis.

**RESULTS:** There was a significant correlation between perceived stress and intention to work (p < 0.001). The regression model showed the variance in the perceived stress with other main predictors.

**CONCLUSIONS:** To maintain an adequate workforce during the pandemic, hospital management should ensure adequate hospital goods supply and deploy retention strategies to retain clinically experienced nurses.

## Introduction

An emerging infectious disease caused by novel coronavirus (coronavirus disease/COVID-19) has been affecting more than 200 countries and territories worldwide. The virus spreads massively from human to human and affects the population without exception, often causing detrimental effects. Even, the transmission of the virus happened from an asymptomatic carrier person [1]. The rapid increase in the number is faster than previous emerging infectious disease, the SARS coronavirus [2].

COVID-19 is an infectious disease caused by the most recently discovered novel coronavirus. This type of coronavirus is known to have higher infectivity than the previous type of coronavirus that causes such infections as the Middle East respiratory syndrome (MERS) and the severe acute respiratory syndrome (SARS) [3]. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019.

People can acquire COVID-19 from others who have the virus. The disease can spread from person to person through tiny droplets from the nose or mouth, which are applied when a person with COVID-19 coughs or exhales. Therefor is why it is important to stay more than 1 m (3 ft) away from a sick person. Moreover, it was reported that unrecognized, asymptomatic carriers with normal diagnostic tests finding could transfer COVID-19 person to person to their family or close contacts [1].

Globally, data on April 6, 2020, the number of confirmed patients was 1.210.956 and the number of death was 67.596. In Indonesia, the number of confirmed patients was 2273 and the number of death was 198. Total mortality from COVID-19 was greater than SARS and MERS combined [4]. The first confirmed case in Indonesia was reported on March 2, 2020. After that, the number of confirmed COVID-19 cases grew rapidly. The first confirmed case in West Sumatra was announced on March 26, 2020. The number of cases grew rapidly in West Sumatra, and recently, West Sumatra was the tenth highest number of cases in Indonesia. The mortality rate among positive laboratory test subjects was 3.4% and the death rate among patients admitted to hospital was 15% [3].

Most Indonesians had mental health problems such as depression during the COVID-19 outbreak,

including nurses [5]. Nurses are at high risk of infectious diseases when treating patients as well as when having inadequate protection from contamination, overwork, frustration, discrimination, isolation, patients with negative emotions, a lack of contact with their families, and exhaustion [6]. Another study reported that 6.4% of health-care workers working with COVID-19 patients experienced stress [7]. Muliantino *et al*., (2021) reported that about 20.7% of Indonesian nurses experienced moderate-to-extremely severe stress. Furthermore, Muliantino *et al*. (2021) explained that the most common stress symptoms found in Indonesian nurses were irritability (1.1%) and feeling hopeless (1.5%).

The main factors associated with stress included the perceived risk of infection to themselves and their families, patient mortality, the availability of clear infection control guidance, the availability of effective protective equipment, recognition of their work by hospital authorities, and a decrease in reported cases of COVID19 [4]. Job stress, poor hospital resources for the treatment, and poor support from family and friends can also lead to burnout among nurses [8], [9], [10], [11], [12], [13]. Isolation experience, the presence of authorized beds for COVID-19, and sufficient protection equipment supply are also related to stress nurses [14]. All of these related obstacles might interfere with nurses' intention to work during a pandemic.

Nevertheless, previous studies have shown that nurses' intention to work during the COVID-19 pandemic is relatively great [14]. This may be related to the role of nurses who have social and professional obligations to provide health care, even in challenging conditions [12]. On the other hand, nurses are health workers who are most at risk of exposure to this virus because they spend more time in close contact with patients [10], [11], [12]. Therefore, it is necessary to explore how perceived stress among nurses and their intention to work during the COVID-19 pandemic. This study aimed to examine perceived stress and intention to work among nurses working in a hospital during the COVID-19 pandemic and to determine the relationship between perceived stress and intention to work considering personal characteristics, job-related characteristics, and hospital condition during the pandemic.

## Methods

### Design

The study design was a cross-sectional descriptive survey design. This study collected the data from nurses who worked at 36 hospitals in West Sumatra, Indonesia.

### Instruments

An online survey was designed based on perceived COVID-19 stress and intention to work questionnaires. The first section of the questionnaire consisted of personal characteristics (age, gender, marriage status, number of children, number of person at home, level of education and isolation experience), job-related factors (working division, length of clinical experience, duty type, and employment status), and condition of the hospital during the COVID-19 pandemic (the presence of authorized beds for COVID-19 patients and the presence of goods supply at the hospital).

For the perceived COVID-19 stress questionnaire, we modified the perceived stress section of the MERS-CoV staff questionnaire and termed it COVID-19 stress. The originally perceived stress questionnaire evaluated 20 different possible factors that could have caused stress among nurses. It required response regarding the severity of the stress factor (0 = very minimal; 1 = slight; 2 = moderate; 3 = very much). The higher the score, the more severe the stress felt by the nurse. The internal consistency coefficients were 0.83 (Cronbach's $\alpha$) for this section [15]. Modifications were made by substituting the term MERS-CoV in the original into COVID-19.

We constructed the intention to work questionnaire since no existing published and validated tool was suitable for this study. We referred to literature with the relevant topic [16], [17], extracted information, and developed 12 items, a five-point Likert scale (strongly disagree to agree strongly) assessing the nurse willingness to attend work during an emergency infectious disease pandemic. Then, it was piloted on 20 nurses. The results of this pilot were summarized, discussed by the research team and a minor adjustment was made in response to the comments from the pilot. For statistical analysis purposes, the respondents' response was scored from 1 for strongly disagree to 5 for strongly agree for favorable items, and reversely for unfavorable items. Total scores range from 12 to 60. The internal consistency coefficients of the instrument in this study were 0.824 (Cronbach's $\alpha$).

### Participant recruitment

We conducted a survey using an internet-based survey tool in April 2020. The research team distributed the survey link via social media to nurses' personal and groups accounts (such as Whatsapp, Facebook, and Instagram). We also ask for those to share the survey link to their colleagues. There were approximately 50 group accounts and 200 personal accounts that received the survey link. Only responses from nurses who work in the hospital were included in this study and we excluded responses from nurses who work at the managerial level.

### Subject

Study subjects were nurses working in primary, secondary, and tertiary hospitals, both public and private, in West Sumatra province of Indonesia. We created an online form and distributed the survey link via social media to approximately 200 personal accounts and 50 group accounts from 6 to 13 April 2020. There were 238 nurses from 36 hospitals (24 public, 12 private) who participated voluntarily in this study.

### Data analysis

The characteristics of the respondents, perceived stress, and intention to work were explored using descriptive statistics. Bivariate associations between the intention to work during the COVID-19 pandemic, perceived stress, and participants' characteristics were assessed using t-tests and ANOVA. T-test was used to analyze differences of perceived stress and intention to work for dichotomous data such as gender, marital status, isolation experience, duty type, employment status, the presence of authorized beds for COVID-19, and goods supply. ANOVA was used to analyze differences of perceived stress and intention to work for polytomous data such as age, number of children, number of person at home, education, working division, and clinical experience. Spearman's correlation test was used to examine the association between perceived stress and intention to work. Multiple regression analysis examined the relationship between the nursing intention to work and perceived stress considering personal and job-related characteristics.

### Protection of human participants

Ethics approval to conduct this study was granted by the Medical Research Ethics Committee of Faculty of Medicine Universitas Andalas (reference number: 281/KEP/FK/2020). The study was conducted in accordance with the approved protocol. Participants of the survey were anonymous and the approval was implied when participants completed and sent their responses.

## Results

### Personal characteristics, job-related characteristics, and hospital condition during the pandemic

There were 238 nurses who responded to the survey and worked in West Sumatera. The majority of the respondents were 30–39 years old (48.7%), female (86.1%), married (74.4%), without children (40,8%), with 1–4 person at home (57.1%), completed undergraduate level of study (62.2%), and without isolation experience (84.9). Based on job-related characteristics, 36.6% of the respondents currently worked in ward, 45.4% had more than ten years of clinical experience, 81.5% were shift workers, and 78.2% worked as permanent employees. Meanwhile, based on hospital conditions during the COVID-19 pandemic, 67.2% of respondents reported the presence of authorized beds for COVID-19 patients, and 67.6% reported the lack of good supplies for their hospitals (Table 1).

### Perceived stress and intention to work according to personal characteristics, job-related characteristics, and hospital condition during the pandemic

Mean scores of perceived stress and intention to work are also presented in Table 1. The overall mean score of perceived stress was 39.82 and mean scores of perceived stress were significantly higher in the no-isolation experience respondents ($p$ =0.038), in respondents who work at division under other categories ($p$ =0.006), and in respondents who work at the hospital without sufficient goods supply ($p$ <.001). Moreover, the overall mean score of intention to work during the COVID-19 pandemic was 42.49 and the mean score of intention to work was significantly higher in respondents with isolation experience ($p$ =0.016) and in respondents who work at a hospital with sufficient goods supply ($p$ <.001). Finally, Spearman's correlation test between perceived stress and intention to work showed that the correlation coefficient was −0.31 (p <0.001). It reveals that the increase in perceived stress significantly decreases the intention to work.

### Correlation between intention to work and perceived stress considering personal characteristics, job-related characteristics, and condition of the hospital

Four regression models were designed to determine the associations between intention to work as the dependent variable, perceived stress as the independent variable, controlling for personal characteristics, job-related characteristics, and condition of the hospital during the COVID-19 pandemic. The covariates in Model 1 were personal characteristics, in Model 2 were personal characteristics and job-related characteristics, whereas in Model 3 were personal characteristics, job-related characteristics, and hospital condition during the COVID-19 pandemic. Intention to work was significantly associated with perceived stress in all models. Based on the $R^2$, the regression model accounted for 24% of the variance in the perceived stress, with goods supply, length of clinical experience, and gender as strong predictors (Table 2).

**Table 1: Perceived stress and intention to work based on Personal characteristics, job-related, and hospital conditions during the pandemic**

| Variables | Categories | Total, n (%) | Perceived stress, mean ± SD | t or F or R | p | Intention to work, mean ± SD | t or F or R | p |
|---|---|---|---|---|---|---|---|---|
| Personal characteristics | | | | | | | | |
| Age (year) | 20–29 | 77 (32.4) | 37.77 ± 11.88 | 2.30 | 0.102 | 42.29 ± 6.88 | 0.98 | 0.376 |
| | 30–39 | 116 (48.7) | 41.25 ± 10.27 | | | 42.19 ± 5.67 | | |
| | 40–50 | 45 (18.9) | 39.62 ± 11.55 | | | 43.60 ± 4.65 | | |
| Gender | Male | 33 (13.9) | 41.09 ± 12.44 | 0.64 | 0.523 | 43.67 ± 6.17 | 1.19 | 0.241 |
| | Female | 205 (86.1) | 39.61 ± 10.91 | | | 42.30 ± 5.88 | | |
| Marriage | Not married | 61 (25.6) | 36.95 ± 11.38 | 2.72 | 0.067 | 43.07 ± 5.73 | 0.58 | 0.560 |
| | Married | 177 (74.4) | 40.80 ± 10.84 | | | 42.26 ± 5.87 | | |
| Number of children | 0 | 97 (40.8) | 37.94 ± 10.73 | 1.65 | 0.162 | 42.87 ± 6.39 | 0.40 | 0.803 |
| | 1 | 43 (18.1) | 39.33 ± 12.20 | | | 41.98 ± 6.47 | | |
| | 2 | 50 (21) | 41.90 ± 10.45 | | | 42.16 ± 5.86 | | |
| | 3 | 33 (13.9) | 42.45 ± 11.36 | | | 43.03 ± 4.00 | | |
| | ≥4 | 15 (6.3) | 40.60 ± 11.03 | | | 41.40 ± 5.26 | | |
| Number of person at home | 1–4 | 136 (57.1 ) | 39.12 ± 10.95 | 0.75 | 0.473 | 42.17 ± 6.46 | 0.95 | 0.385 |
| | 5–8 | 98 (41.2) | 40.63 ± 11.39 | | | 43.03 ± 5.14 | | |
| | ≥9 | 4 (1.7) | 43.50 ± 10.66 | | | 40.00 ± 4.08 | | |
| Education | Diploma | 83 (34.9) | 41.13 ± 14.07 | 1.07 | 0.343 | 43.00 ± 5.56 | 0.80 | 0.447 |
| | Undergraduate | 148 (62.2) | 38.99 ± 11.28 | | | 42.13 ± 6.07 | | |
| | Postgraduate | 7 (2.9) | 41.57 ± 14.07 | | | 44.00 ± 7.23 | | |
| Isolation experience | Yes | 36 (15.1) | 36.19 ± 11.02 | −2.13 | 0.038 | 44.75 ± 5.89 | 2.50 | 0.016 |
| | No | 202 (84.9) | 40.46 ± 11.04 | | | 42.08 ± 5.85 | | |
| Job-related characteristics | | | | | | | | |
| Working division | Emergency | 27 (11.3) | 39.85 ± 8.65 | 3.35 | 0.006 | 42.04 ± 5.55 | 1.39 | 0.226 |
| | ICU/HCU | 41 (17.2) | 41.07 ± 10.96 | | | 43.32 ± 5.81 | | |
| | Ward | 87 (36.6) | 38.90 ± 11.76 | | | 41.87 ± 6.37 | | |
| | Ward for COVID-19 | 19 (8) | 37.26 ± 10.06 | | | 45.26 ± 5.89 | | |
| | Outpatient clinic | 28 (11.8) | 35.29 ± 10.18 | | | 41.46 ± 5.62 | | |
| | Others | 36 (15.1) | 45.44 ± 10.76 | | | 42.69 ± 5.23 | | |
| Clinical experience | <5 | 63 (26.5) | 37.70 ± 11.97 | 1.57 | 0.209 | 41.00 ± 7.07 | 2.83 | 0.061 |
| | 5–10 | 67 (28.2) | 40.39 ± 10.17 | | | 42.78 ± 5.30 | | |
| | >10 | 108 (45.4) | 40.69 ± 11.11 | | | 43.18 ± 5.45 | | |
| Duty type | 3-shifts per day | 194 (81.5) | 40.40 ± 10.93 | 1.64 | 0.106 | 42.44 ± 5.91 | −0.26 | 0.792 |
| | Daytime only | 44 (18.5) | 37.23 ± 11.71 | | | 42.70 ± 6.05 | | |
| Employment status | Permanent | 186 (78.2) | 40.09 ± 11.14 | 0.72 | 0.470 | 42.35 ± 5.76 | −0.63 | 0.529 |
| | Nonpermanent | 52 (21.8) | 38.83 ± 11.08 | | | 42.98 ± 6.51 | | |
| Hospital condition during the pandemic | | | | | | | | |
| The presence of authorized beds for COVID-19 | Yes | 160 (67.2) | 39.37 ± 11.54 | −0.92 | 0.357 | 43.06 ± 5.86 | 2.12 | 0.035 |
| | No | 78 (32.8) | 40.73 ± 10.21 | | | 41.32 ± 5.93 | | |
| Goods supply | Sufficient | 77 (32.4) | 36.38 ± 9.72 | −3.56 | 0.000 | 45.21 ± 5.09 | 5.41 | 0.000 |
| | Insufficient | 161 (67.6) | 41.46 ± 11.39 | | | 41.19 ± 5.87 | | |
| Perceived stress, mean ± SD | | | 39.82 ± 11.12 | | | | −0.31 | 0.000 |
| Intention to work, mean ± SD | | | 42.49 ± 5.92 | | | | | |

SD: Standard deviation.

**Table 2: Regression estimates for intention to work**

| Variables | Crude | | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|---|---|
| | B (SE) | p | B (SE) | p | B (SE)) | p | B (SE) | p |
| Perceived stress | −0.17 (0.03) | <0.001 | −0.17 (0.03) | <0.001 | −0.18 (0.03) | <0.001 | −0.15 (0.03) | <0.001 |
| Personal characteristics, n (%) | | | | | | | | |
| Age (year) | | | 1.66 (0.69) | 0.017 | 0.97 (0.76) | 0.203 | 0.39 (0.75) | 0.476 |
| Gender | | | 1.74 (1.04) | 0.096 | 2.12 (1.06) | 0.047 | 2.09 (1.03) | 0.044 |
| Marriage | | | −0.62 (0.98) | 0.529 | −0.59 (0.98) | 0.545 | −0.61 (0.96) | 0.525 |
| Number of children | | | −0.46 (0.40) | 0.251 | −0.57 (0.40) | 0.158 | −0.42 (0.39) | 0.287 |
| Number of person at home | | | 0.94 (0.78) | 0.231 | 0.83 (0.78) | 0.288 | 0.61 (0.76) | 0.422 |
| Education | | | −0.88 (0.70) | 0.213 | −0.59 (0.72) | 0.412 | −0.40 (0.71) | 0.574 |
| Isolation experience | | | −2.17 (1.03) | 0.036 | −1.83 (1.03) | 0.078 | 1.21 (1.02) | 0.236 |
| Job-related characteristics, n (%) | | | | | | | | |
| Working division | | | | | 0.01 (0.25) | 0.951 | −0.04 (0.24) | 0.864 |
| Clinical experience | | | | | 1.45 (0.54) | 0.008 | 1.27 (0.53) | 0.018 |
| Duty type | | | | | 0.49 (1.02) | 0.633 | 0.25 (1.00) | 0.799 |
| Employment status | | | | | −0.38 (0.94) | 0.689 | −0.08 (0.92) | 0.926 |
| Hospital condition during the pandemic, n (%) | | | | | | | | |
| The presence of authorized beds for COVID-19 | | | | | | | 1.50 (0.77) | 0.052 |
| Goods supply | | | | | | | 2.74 (0.79) | 0.001 |
| $R^2$ | 0.11 | | 0.16 | | 0.19 | | 0.24 | |
| Adj $R^2$ | 0.10 | | 0.13 | | 0.14 | | 0.19 | |
| F | 29.38 | <0.001 | 5.61 | <0.001 | 4.43 | <0.001 | 5.07 | <0.001 |

# Discussion

This research adds to the understanding of Indonesian nurses' intention to attend their workplace during a pandemic of newly emerging infectious disease, its correlation with perceived stress, and the factors that influence this intention. Overall, Indonesian nurses are intended to attend their workplace during a pandemic. However, such stress, personal factors, job-related factors, and workplace-related factors influenced their intention.

## *Intention to work*

When treating patients with infection diseases and in situation with inadequate protection from contamination, overwork, frustration, discrimination, isolation, patients with negative emotions, a lack of contact with their families, and exhaustion, nurses' intention to work might be disturbed. The present study showed that the mean of nurse's intention to work score was 42.49 (score range from 12–60). It means that nurse's intention to work was at a moderate level. The nurse was one of the professions that have an intention to work during an emerging infectious disease [18].

In comparison to the results of the previous study, 90% of nurses indicated their intention to work during a pandemic [19]. Moreover, the percentage of healthcare workers who expressed an intention to work during a pandemic ranged from 23.1% to 95.8% [20]. The researchers suggest that this condition corresponds with earlier work which showed an ambiguity between feel motivated by a sense of obligation to work and a significant barrier that may prevent them from doing so [21]. The intention to work during a pandemic was closely linked to the sense of duty [22]. According to the results of this study, the sense of responsibility of respondents reported to be high level.

There was a significant difference in the mean score of intention to work according to hospital goods supply and the length of clinical experience. A previous meta-analysis study revealed that perceived personal safety at work and perception of pandemic risk (aware that a pandemic was likely) were both associated with increased willingness to work. Likewise, the provision of protective measures (mainly personal protective equipment) increased willingness to work [19], [20]. It can be inferred that nursing intention is influenced by resources both for patients with infectious diseases and for nurses who take care of them.

The length of clinical experience is significantly associated with the intention to work during the COVID-19 pandemic. Clinical experience indirectly built up knowledge and skills as well as the professional qualities of a nurse. Control factors such as knowledge and skills (internal) and supplies (external) influenced more than normative factors on the intention to respond to a public health event [23]. This study result suggests the need for attention from the hospital management and government to be prepared for the emergency needs during a pandemic and the possibility of the absenteeism of the staff for some reasons beyond those currently anticipated.

### Perceived stress

COVID-19 is a fulminant infectious disease. As it is highly contagious, many people are frightened by it and even talk fearfully about coronavirus, which can also be observed in nurses. Our results showed that the overall mean score of perceived stress of nurses at work tends to be high during the COVID-19 outbreak (mean score 39.82, range of score was 0–60). Nurses were susceptible to experiencing stress. Such risks occur during an initial encounter with a patient, at the beginning of an outbreak, and when faced with an overwhelming number of patients [24]. Moreover, they have a deep understanding of the dangers of COVID-19, so they are prone to feel anxiety and fear. Safety from infection and protective measures was the main concern as they worried most that they might be infected and might infect their families with COVID-19 [25]. In addition, the main factors associated

with stress among frontline medical staffs included the perceived risk of infection to themselves and their families, patient mortality, the availability of clear infection control guidance, the availability of effective protective equipment, recognition of their work by hospital authorities, and a decrease in reported cases of COVID19 [4], [26].

Based on the transaction models of Lazarus, stress is processed in which requirements outweigh the adaptive capacities of the individual. It means that stress appears when there is a discrepancy between requirements and resources. The requirements can be both external and internal [27]. According to our findings, external factors that triggered stress were the absence of authorized beds for COVID-19 patients in the workplace and the limitation of logistic supply to protect nurses during working time. Furthermore, internal factors were clinical experience in the isolation ward.

This study result was congruent with previous study which revealed that staff were worried about the shortage of protective equipment and feelings of incapability when faced with critically ill patients [28]. Therefore, hospital managers and the government must increase the supply of adequate logistics, increase health promotion for the prevention of epidemic transmission, and also offer psychological support to nurses. Stress perceived by an individual could develop stress itself. During the COVID-19 outbreak, medical health workers had psychosocial problems and risk factors for developing them. They were in need of attention and recovery programs aimed at empowering resilience and psychological well-being [29], [30].

According to research findings, perceived stress was reversely associated with intention to work. Concerns on personal safety were the main stress reported by respondents. In relation to these, results on intention to work also showed that assurance by the hospital management on personal security and safety at workplace posed as the main reasons for the willingness of the nurse to attend work.

The major limitation of this study was timing bias. We did the data collection during the increasing number of COVID-19 patients, thus the data about the intention to work and perceived stress might not depict the overall situation. In addition, because the instrument used in the study was based on previously designed questionnaires and was modified for its purposes, it might have influenced the study result.

## Conclusions

Perceived stress were importantly associated with the intention to work during a pandemic. To maintain

an adequate workforce during the COVID-19 pandemic, government and hospital management should ensure that policies and procedures include providing adequate hospital goods supply, deploying numerous retention strategies to retain clinically experienced nurse, and convincing nurses that pandemic will end soon. Programs aimed at empowering resilience and psychological well-being might reduce stress and increase intention to work. A more wide-ranging study is needed to get a representation of this phenomenon among nurses in Indonesia.

## Acknowledgment

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