



## Analysis of Nurses' Fatigue and Stress Factors in the COVID-19 Isolation Room in Indonesia: A Cross-Sectional Research

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### ABSTRACT

COVID-19 pandemic has increased workloads and psychologically affected the nurses due to a long time of exposure to the virus, and causes a decrease in energy, leading to stress and fatigue. This study aims to analyze the factors associated with fatigue and stress experienced by nurses in the COVID-19 isolation room in Indonesia. This study involved 50 nurses who worked in the hospital's COVID-19 isolation room. The instrument used the demographic data, a Fatigue Scale-14 questionnaire, and a Perceived Stress Scale-10. The results of the validity and reliability tests carried out on both instruments were declared valid and reliable. The data were collected by providing questionnaire link in form of a google form link through WhatsApp to each research sample. Subsequently, the collected data were analyzed using cross-tabulation analysis and chi-square test. Results showed that the majority of respondents were aged 31-40 years and most were female (35%). A total of 64% experienced moderate fatigue and 82% of nurses were in the moderate stress category. Based on the fatigue data tabulation analysis, there is no relationship between demographic data variables and fatigue. However, there is a relationship between work duration and stress variables as well as fatigue and stress experienced by nurses. These results showed that the stress and fatigue experienced by COVID-19 nurses are related to the nurses's certain characteristics that have the potential to worsen mental health conditions. It is recommended to explore more related to fatigue factors in the future with specific nursing interventions.

**Keyword:** COVID-19, Fatigue, Mental Health, Nurses

### 1. Introduction

The COVID-19 cases continue to increase since it was announced as a global pandemic by WHO (World Health Organization, 2020) in early 2020. In Indonesia, there was also a massive increase in the number of confirmed from February 2020 (Worldometers, 2021) until mid-2021. This has significantly affected the workload in health services designated by the government as official COVID-19 hospitals. In North Sumatera, the government has appointed several COVID-19 hospitals, which include the Central General Hospital (RSUP). H. Adam Malik, Medan, is a government referral hospital that is categorized as a type A hospital, with hundreds of beds for patients spread over several rooms (Pekuweli, 2021) and 50 nurses working in isolation rooms.

Research showed that high rates of COVID-19 have a physical and mental impact on healthcare workers in early 2020. In China, it was reported that nurses are vulnerable to stress and other symptoms of mental disorders at the beginning of the pandemic (Hong et al., 2021). Furthermore, some nurses were at high risk of committing suicide due to symptoms of major depression experienced while treating COVID-19 patients (An et al., 2020). The occurrence of psychological disorders in many nurses was due to several

factors such as the lack of quality personal protective equipment, fear of contracting or infecting others, lack of support from family and society, which is exacerbated by sleep problems that arise during the pandemic (Sampaio et al., 2021). The research conducted by Pappa et al (2021) discovered that insomnia of health workers during the pandemic affected their deteriorating mental health status. Daily exposure to critically ill COVID-19 patients also triggered emotional exhaustion of nurses which contributes to poor physical and mental condition (Chen et al., 2021). This is inseparable from the high workload and shifts of nurses during the pandemic (Chen et al., 2021) and has caused prolonged stress, fatigue, and turnover (Magnavita et al., 2020).

The cross-sectional research conducted by Zhan et al (2020) analyzed several factors related to the fatigue felt by nurses working in hospitals. The results showed that the worse psychological condition, such as symptoms of depression, anxiety, and high stress, was closely correlated to the fatigue experienced by nurses. This is also supported by Teng et al (2020) which concluded that fatigue is closely related to anxiety and depression. These two early symptoms of mental disorders can cause a decrease in productivity and trigger burnout (Sampaio et al., 2021). Moreover, pandemic conditions without uncertainty trigger stress in most nurses and lead to changes in concentration, irritability, anxiety, insomnia, and decreased work motivation (Talaee et al., 2020).

However, research on the physical and mental health conditions of nurses during the pandemic has not been widely carried out in Indonesia. Meanwhile, it was previously stated that the unstable psychological condition of nurses triggers mental fatigue, reduces productivity (Jang et al., 2018), and decreases the quality of health services in hospitals. With a health crisis such as the COVID-19 pandemic, nurses and health workers who can work optimally without psychological pressure are needed to reduce morbidity due to virus transmission. Therefore, this research aims to analyze the factors related to fatigue and stress experienced by nurses in the COVID-19 isolation room at H. Adam Malik Central General Hospital, Medan, Indonesia.

## 2. Method

This quantitative correlational research with a cross-sectional design was conducted online from April to July 2021. This aims to analyze the factors that affect nurses' fatigue and stress in the COVID-19 isolation room at H. Adam Malik Central General Hospital, and determine the relationship between the two variables. The samples used were 50 nurses who worked in a specific isolation room for COVID-19 patients in Adam Malik General Hospital, Medan – Indonesia. All nurses were recruited as the research samples.

The instruments used include a demographic data questionnaire, a Fatigue Scale-14 questionnaire, and a Perceived Stress Scale-10 questionnaire. The validity was carried out using the construct validity test and the results were determined by examining the  $r_{\text{count}} > r_{\text{table}}$ , where a  $r_{\text{table}}$  value of 0.361 was obtained on the fatigue questionnaire. The results of the fatigue questionnaire validity test for all items also showed  $r_{\text{count}} > r_{\text{table}}$  which indicated that the test was valid. The stress questionnaire uses a content validity test, meanwhile, the instrument was tested for validity with the results of the CVI (Content Validity index) Perceived Stress Scale of 0.967 and declared valid. This research has also conducted a reliability test on 30 nurses at another government hospital in Medan, where the fatigue and stress questionnaire values  $\alpha=0.858$  and  $\alpha=0.917$ . The data reliability was measured using Cronbach Alpha, with the provision that the questionnaire is reliable when the value was  $> 0.60$ ; hence, the two questionnaires were declared reliable for use. The Perceived Stress Scale instrument consists of 10 questions with a Likert scale rating of 1-4, while the Fatigue Scale-14 instrument consists of 14 questions with yes and no answer options. The permission to use the two instruments were write through email and there is no objection to put the instrument in this study. The original instruments are in English and the authors sent both instruments to University of Sumatera Utara Language Centre for translation. After translation, the two instruments were re-read by one of the lecturers in Faculty of Nursing, University of Sumatera Utara to suits the translation with the study content.

The data were collected after explaining to the prospective research sample through telephone about the purpose and freedom to withdraw when the respondent needed. After the respondents have agreed, a research questionnaire link in google form was provided through WhatsApp to each sample. The filling out was followed up online through personal discussion to nurses through the head of the room on duty in

the isolation room to ensure the completeness of the research data. The filling out was followed up online through personal discussions with nurses by the assistance of the head of isolation room to ensure the completeness of the data. The ward head also ensured that each nurse filled out a complete online survey. Subsequently, the collected data were analyzed using cross-tabulation analysis and chi-square test.

The research was approved by the institutional human research ethics committee of Universitas Sumatera Utara, with reference number 309/KEP/USU/2021.

### 3. Result and Discussion

The results showed the majority of respondents are aged 31-40 years, and most are female (35%). Furthermore, approximately 62% of nurses worked less than one year and 41 were married (82%). For the frequency distribution of fatigue and stress levels, only a small proportion of nurses experienced severe fatigue (12%) and severe stress (6%). Most of nurses are within the range of moderate levels of fatigue (64%), while moderate stress was 82%. The details are shown in the table 1.

Table 1. Descriptive Statistics of Demographic

<b>Respondents Characteristics</b>	<b><i>n</i></b>
<b>Age</b>	
21-30 years	19 (38%)
31-40 years	22 (44%)
41-50 years	9 (18%)
<b>Gender</b>	
Male	15 (30%)
Female	35 (70%)
<b>Education</b>	
Diploma in Nursing	25 (50%)
Bachelor of Nursing	25 (50%)
<b>Duration of Work</b>	
<1 year	31 (62%)
>1 year	19 (38%)
<b>Marital status</b>	
Married	41 (82%)
Not married yet	9 (18%)
<b>Fatigue Level</b>	
Mild	12 (24%)
Moderate	32 (64%)
Severe	6 (12%)
<b>Stress Level</b>	
Mild	6 (12%)
Moderate	41 (82%)
Severe	3 (6%)

**Note:** fatigue level for mild (0-4), moderate (5-9), and severe (10-14).

Stress level for mild (0-12), moderate (13-26), and severe (27- 40).

Based on the results of cross-tabulation between demographic data variables and fatigue, there was no fatigue in the severe category at the age of 41-50 years and the unmarried sample group. Moreover, females are twice as likely to experience moderate fatigue (44%) than males (20%). For marital status, people who had fatigue in the mild to severe category are married compared to those unmarried. For the duration of work, fewer nurses experienced fatigue in the mild category (8%) than in the severe category (10%). There is no relationship between demographic data variables and fatigue. More information is shown in table 2.

Table 2. Cross Tabulation Results of Fatigue Variables

Variable	Fatigue			P-Value
	Mild n (%)	Moderate n (%)	Severe n (%)	
<b>Age</b>				
20-30 years	3 (6%)	14 (28%)	2 (4%)	0.066
31-40 years	4 (8%)	15 (30%)	4 (8%)	
41-50 years	5 (10%)	3 (6%)	0 (0%)	
<b>Gender</b>				
Male	2 (4%)	10 (20%)	3 (6%)	0.380
Female	10 (20%)	22 (44%)	3 (6%)	
<b>Education</b>				
Diploma in Nursing	6 (12%)	15 (30%)	4 (8%)	0.770
Bachelor of Nursing	6 (12%)	17 (34%)	2 (4%)	
<b>Marital status</b>				
Married	11 (22%)	24 (48%)	6 (12%)	0.251
Single	1 (2%)	8 (16%)	0 (0%)	
<b>Duration of Work</b>				
<1 year	4 (8%)	22 (44%)	5 (10%)	0.059
≥1 year	8 (16%)	10 (20%)	1 (2%)	

Note:  $p < .001$ .

The cross-tabulation results between demographic data variables and stress showed that there is no stress in the severe category at the age of 41-50 years, in the group of nurses who worked for more than one year, and in those who are unmarried. However, there is a relationship between work duration and stress experienced by nurses with a P-Value of 0.021. For the gender category, females experience more moderate stress (58%) than males (24%). The married sample also experienced more moderate stress (66%) compared to those unmarried (16%). The distribution of data is almost the same in each stress category for the education level. Furthermore, approximately 6% of both diplomas and bachelors nursing are under mild stress. Based on the cross-tabulation results between stress and fatigue, there is a significant relationship between fatigue and stress with P-Value  $< 0.001$ . More details are shown in table 3.

Table 3. Cross Tabulation Results of Stress Variables

Variable	Stress			P-Value
	Mild n (%)	Moderate n (%)	Severe n (%)	
<b>Age</b>				
20-30 years	1 (2%)	17 (34%)	1 (2%)	0.599
31-40 years	3 (6%)	18 (36%)	2 (4%)	
41-50 years	2 (4%)	6 (12%)	0 (0%)	
<b>Duration of work</b>				
<1 year	1 (2%)	27 (54%)	3 (6%)	0.021*
≥1 year	5 (10%)	14 (28%)	0 (0%)	
<b>Gender</b>				
Male	1 (2%)	12 (24%)	2 (4%)	0.342
Female	5 (10%)	29 (58%)	1 (2%)	
<b>Education</b>				
Diploma in Nursing	3 (6%)	20 (40%)	2 (4%)	1.000
Bachelor of Nursing	3 (6%)	21 (42%)	1 (2%)	
<b>Marital status</b>				
Married	5 (10%)	33 (66%)	3 (6%)	0.838
Unmarried yet	1 (2%)	8 (16%)	0 (0%)	

Variable	Stress			P-Value
	Mild n (%)	Moderate n (%)	Severe n (%)	
<b>Fatigue</b>				
Mild	4 (8%)	8 (16%)	0 (0%)	<0.001*
Moderate	2 (4%)	30 (60%)	0 (0%)	
Severe	0 (0%)	3 (6%)	3 (6%)	

Note: \* $p < .001$ .

The results showed that most of the samples are female, married, with average levels of fatigue and stress in the moderate category. Only a small proportion of nurses experienced stress and fatigue in the severe category. This is in line with the research by UL Huda et al (2021), where most of female nurses experiencing stress during the pandemic are single. Several factors that have contributed to this situation are the lack of support from families and hospitals, the presence of family members infected with COVID-19, the deteriorating physical and mental health status during the pandemic (Hong et al., 2021). Meanwhile, marriage is one of the protective factors in reducing the risk of exposure to symptoms of depression. In this research, the results indicated that the majority of the sample is married (82%), and only a small proportion of nurses experienced stress and fatigue in the severe category. The cross-tabulation analysis also showed that there are no unmarried nurses who experience severe stress and fatigue. The married mostly have moderate stress and fatigue, while it was severe for a small percentage. Previous research showed that the status of married nurses significantly contributes to the worsening of psychological conditions during the pandemic by increasing fatigue and stress (Zhan et al., 2020; Huang et al., 2019).

Although family support is important for nurses to work professionally, they still experienced an increase in psychological pressure during the pandemic due to the concerns of transmitting the virus to family members, specifically children and spouses (Pappa et al., 2021). Fatigue is a natural process of the human body in response to physical and psychological stress, however, it can affect a person's mental condition over a long period (Enoka, R., Duchateau, 2016). This is because fatigue triggers feelings of excessive energy drain which ultimately affects daily activities and reduces motivation (Carpenito-Moyet, 2010).

The results indicated that all nurses within the age of 21-50 years experience stress and fatigue, while only those aged over 40 years are not indicated by stress and severe fatigue. This showed that psychological vulnerability is generally experienced by nurses below the age of 35 years (Kim et al., 2021) and the average age of those with fatigue within the age below 30 years (Çelik et al., 2017). Furthermore, female and young age are the two main factors that contribute to some psychological symptoms (Pappa et al., 2021) such as stress, depression, anxiety, and fatigue. It was also discovered that work duration, marital status, and age correlated positively with fatigue (Nuraini et al., 2020) as the characteristics of the sample in this research. Although the research conducted by Hendy et al (2021) discovered no relationship between work duration and perceived stress during the pandemic. Huang et al (2019) stated that working long hours led to nurses' vulnerability to anxiety, depression, and sleep disturbances. This became the main trigger of stress and fatigue for nurses during the pandemic because of the increased workload due to the global health crisis.

The research by Rodríguez-Rey et al (2020) showed that the majority of young nurses experience fatigue. However, in this research, there was no relationship between age and conditions of stress and fatigue experienced by the sample, while others stated that there is a relationship between age and a person's psychological vulnerability (Kim et al., 2021; Tee et al., 2020). The results of the cross-tabulation showed that there are no fatigue and severe stress categories in the 41-50 years age range, while moderate and mild stress categories are discovered in young age samples. According to Zhan et al (2020), severe stress is usually dominated by people under the age of 30 years. This is because the stress that arises in nurses during a pandemic usually occurs due to inadequate personal protective equipment, and patient care regulations that continue to change because of the unprecedented COVID-19 pandemic (LoGiudice & Bartos, 2021).

The results showed that there is a significant relationship between the level of fatigue and stress in nurses while treating COVID-19 patients in the isolation room with a P-value <0.001. Previous research also showed that the pandemic had caused an increase in stress on the global community, including health professionals (Tee et al., 2020). Nurses also experienced fatigue due to the high workload and lack of hospital support in dealing with the increase in cases in early 2020 (Teng et al., 2020). According to

Sagherian et al (2020), the nurses' stress has the potential to experience fatigue. Meanwhile, fatigue is a further psychological impact of the prolonged stress experienced by nurses at the beginning of the pandemic (Kamali et al., 2020). A research by Zhan et al (2020) showed that there was a significant relationship between stress and nurse fatigue during the pandemic as stated by Huang et al (2019), and Zhan et al (2020). This indicated the role of fatigue in increasing the stress experienced by nurses during the pandemic, as well as to other population in the hospital such as the family caregivers (Tumanggor et al., 2021). Therefore, the more tired a nurse is with the high burden of treating COVID-19 patients, the higher the stress conditions experienced, specifically with the supporting variables such as gender, duration of work, young age, and marital status.

#### 4. Conclusion

The results showed several factors that are different from other research with the same variables, where female and young age groups are risk factors for early symptoms of mental disorders. Stress and fatigue are also not in the severe category of unmarried sample groups, while the majority of research stated that marriage is a supporting factor in reducing the risk of exposure to stress, depression, anxiety, and fatigue. Moreover, there is a significant positive relationship between fatigue and stress of nurses at the H. Adam Malik Central General Hospital isolation room during the pandemic. This showed that the higher the level of fatigue, the greater the stress experienced by nurses. It is recommended to carry prospective research related to the nurses' health status during global pandemic, as the basis data to establish evidence-based interventions to minimize the impact of overload burden in the future in among nurses. In addition, the policy of the health professionals should be considered important in hospital and community public health services in Indonesia.

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#### Conflict of Interest

The researchers declared there is no conflict of interest in this study.

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