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Analysis of Associated Factors for Nurses' Anxiety Levels in Caring for COVID-19 Patients

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ABSTRACT

The COVID-19 pandemic has created a significant crisis for various groups, including nurses. Direct contact with COVID-19 patients increases the risk of infection, thereby can increase nurses' anxiety due to the risk of transmission that may happen to their family members. This study aims to analyze the associated factors of nurses' anxiety levels in caring for COVID-19 patients. The design is an analytic study with a cross-sectional survey. The research sample was 201 nurses with purposive sampling in Covid and non-Covid wards at Dr. Mohammad Hoesin General Hospital from April to May 2021. The instrument was the Indonesian version of the Hamilton Anxiety Rating Scale (HAM-A). Data analysis was done using univariate, bivariate, and multivariate. Of the 201 nurses, 163 came from the non-Covid and 38 from the Covid wards. The levels of nurses' anxiety were mild (94%), mild-moderate (2.5%), moderate-severe (3%), and severe (0.5%). Associated factors were related to gender (p=0.039), living with the elderly (p=0.041), and being pregnant or breastfeeding (0.013) (p<0.05). Male respondents and being pregnant or breastfeeding showed the most significant relationship in influencing nurses' anxiety (p=0.048, p=0.017). There was no relationship between work units and nurses' anxiety in caring for COVID-19 patients (p=0.086; p>0.05). Gender factors and being pregnant or breastfeeding are the dominant factors in nurses' anxiety levels. The COVID-19 pandemic has been shown to affect nurses' emotional responses. Counseling is needed to reduce anxiety and prevent psychological problems during the pandemic.

1. Introduction

SARS CoV-2 causes respiratory infections ranging from the common cold to fatal diseases such as middle east respiratory syndrome (MERS) or severe acute respiratory syndrome (SARS). According to WHO data, individuals exposed to COVID-19 in the world are spread across 216 countries and regions, with a total case of 116,736,437 people. This number continues to grow every day. The United States is the country with the highest number of positive COVID-19 cases, with a total of 28,700,966 cases. In Indonesia, based on WHO data, the incidence of COVID-19 is 1,386,556 people with a population of 269,603,400, ranking 18 out of 216 countries in the world. The population that has been confirmed positive for COVID-19 is mostly in the productive age group between 31-45 years.[1]

The COVID-19 pandemic has caused a significant crisis in various groups and populations in the world, especially nurses. This direct contact can increase the risk of infection with infectious diseases. Nurses' anxiety can increase because the risk of transmitting this COVID-19 disease is not to themselves, but they are also worried that it will infect their families in their homes.

Anxiety is a vague feeling of fear that is accompanied by feelings of uncertainty, insecurity, powerlessness, and isolation. Symptoms associated

with anxiety in response to the COVID-19 pandemic include insomnia, changes in concentration, irritability, reduced productivity and interpersonal conflict, stigma, and fear of transmission to the vulnerable. Anxiety in caring for confirmed COVID-19 patients can affect nurses' care, and the quality of care is not optimal.[2]

Dr. Mohammad Hoesin General Hospital is a referral hospital for the Sumatra region, with a total of 900 nurses. Based on the initial survey, there were 36 inpatient wards where nurses had a high risk of contracting COVID-19 and the risk of infecting their families at home. Data from the hospital in March 2021 stated that the number of nurses who were confirmed positive for COVID-19 was 46 nurses working in the covid wards and 99 nurses working in the non-covid wards. The severity of the illness and uncertainty regarding the treatment of COVID-19 can cause anxiety to nurses, which can ultimately affect the quality of care provided to patients.[3]

Based on the current situation of the COVID-19 pandemic, it is essential to conduct research using the online survey method to find out more about the factors related to the anxiety level of nurses in caring for patients with confirmed COVID-19. This article is useful for exploring related factors that contribute to nurses' anxiety in caring for COVID-19 patients during the pandemic. In addition, this article provides base information for psychotherapeutic interventions to improve nurses' psychological well-being.

2. Methods

This research is a quantitative and analytic study with a cross-sectional design approach. The research was conducted from March to July 2021 at Dr. Mohammad Hoesin General Hospital. The research location includes several inpatient wards such as Ogan, Rawas, Kelingi, Lematang, Musi, Enim, Rupit, Komering, Selincah, Lakitan, and Rambang of Dr. Mohammad Hoesin General Hospital. Data were collected by purposive sampling from April to May 2021. In this study, 201 nurses who were or had experience caring for COVID-19 patients in inpatient settings, both non-covid and covid wards, filled out the survey.

This study uses the Indonesian version of the Hamilton Anxiety Rating Scale (HAM-A) instrument to measure the anxiety level of nurses in caring for COVID-19 patients. The HAM-A scale has been proven valid and reliable for measuring anxiety in nursing research with the validity of the Pearson correlation of 0.529-0.727 and the reliability of Cronbach's alpha of 0.756.[20] The instrument consists of 14 groups of symptoms, including feelings of anxiety, tension, fear, sleep disturbances, intellectual impairment, depressive mood, somatic symptoms, sensory symptoms, cardiovascular symptoms, respiratory symptoms, gastrointestinal symptoms, urogenital symptoms, autonomic symptoms, and behaviour during communication. Each group was given a scale of 0, 1, 2, 3, and 4. Then each score from 1-14 symptom groups was added up and categorised as <17 (mild anxiety), 18-24 (mild-moderate), and 25-30 (medium-severe).

The researcher first applied for permission to collect data from the Diklit (Research and Education Office) and ethical clearance from the Ethics Committee of Dr. Mohammad Hoesin General Hospital. After obtaining permission and ethical feasibility, the researcher coordinates with the head of departments and the head of nurses to provide information about research and data collection procedures. The researcher gave research invitations to the head of nurses and nursing staff. The head of nurses assisted in randomising the sample and recruiting respondents who agreed voluntarily undertake the study. The researcher then coordinated with the head of nurses to provide a survey link which was then given to the nursing staff for filling. Data collection begins by first explaining the research objectives through the survey link. Research activities are carried out if the respondents are willing and give informed consent before filling

out the survey link. Researchers monitored the progress of filling out the online questionnaires. After collecting data, the researcher checked the completeness of the data. All data will only be used for scientific purposes. Researchers analysed the data with the help of statistical software.

Data analysis in this study was carried out by univariate, bivariate, and multivariate analysis. Univariate analysis was carried out using the variables in this study described descriptively through the frequency distribution table. The frequency distribution table is used to determine the characteristics of the data distribution. Bivariate analysis was carried out to see the relationship between factors that influence nurses' anxiety levels in caring for COVID-19 patients using the Spearman correlation test, $\alpha < 0.05$ and 95% Confidence Interval (CI). This bivariate test was conducted to obtain variables that met the requirements for a multivariate test. After doing a bivariate analysis between each independent variable and a dependent variable, then the magnitude of the p-value is seen for variables that have a p-value < 0.25, these variables can be included in the multivariate model.[11] Multivariate analysis in this study was to determine the magnitude of the relationship of each factor studied using multiple linear regression analysis, $\alpha < 0.05$, and Confidence Interval (CI) 95%.

3. Results

The independent variables in this study include gender, age, education, marital status, work unit, length of work, living with the elderly, being pregnant or breastfeeding, having comorbidities, having a history of covid, and having depression in the last year. The dependent variable is the level of nurses' anxiety. All types of data in this variable are categorical data, and the data presentation uses the frequency distribution table, which can be seen in Table 1.

Table 1. Demographic characteristics of respondents.

		n	%
Gender	Male	17	8.5%
	Female	184	91.5%
Age	17-25 years old	13	6.5%
	26-35 years old	118	58.7%
	36-45 years old	50	24.9%
	>45 years old	20	10.0%
Education	Diploma	89	44.3%
	Bachelor	109	54.2%
	Master	3	1.5%
Marital status	Married	150	74.6%
	Single	46	22.9%
	Widowed	5	2.5%
Work unit	Covid wards	38	18.9%
	Non-covid wards	163	81.1%
Length of work	<1 year	26	12.9%
	1-5 years	62	30.8%
	6-10 years	32	15.9%
	11-15 years	54	26.9%
	16-20 years	7	3.5%
	>20 years	20	10.0%
Living with elderly	Yes	73	36.3%
	No	128	63.7%
Being pregnant or breastfeeding	Yes	43	21.4%
	No	158	78.6%
Having comorbidities	Yes	33	16.4%
	No	168	83.6%
Having a history of covid	Yes	48	23.9%
	No	153	76.1%
Depression in the last year	Yes	0	0.0%
	No	201	100.0%
Anxiety level	Mild	189	94.0%
	Mild-moderate	5	2.5%
	Moderate-severe	6	3.0%
	Very severe	1	0.5%

The univariate analysis of the research variables in Table 1 shows that of the 201 samples, the majority of respondents were women (91.5%). More than half of the respondents were aged 26-35 years (58.7%). The highest level of education was a bachelor's degree (54.2%). The majority of respondents were married (74.6%). Most nurses were from non-covid wards (81.1%) and had work experience of 1-5 years (30.8%). Less than half of the respondents were living with the elderly (36.3%), were pregnant or breastfeeding (21.4%), had comorbidities (16.4%), and had a previous history of COVID-19 (23.9%). The level of anxiety in the majority of respondents was mild anxiety (94%).

Table 2. Results of bivariate test of factors causing nurses' anxiety in caring for patients with confirmed COVID-19.

		Anxiety								p
		Mild		Mild-moderate		Moderate-severe		Very severe		
		n	%	n	%	n	%	n	%	
Gender	Male	14	82.4%	2	11.8%	1	5.9%	0	0.0%	**0,039$***
	Female	175	95.1%	3	1.6%	5	2.7%	1	0.5%	
Age	17-25 years old	12	92.3%	1	7.7%	0	0.0%	0	0.0%	0,527#
	26-35 years old	110	93.2%	4	3.4%	4	3.4%	0	0.0%	
	36-45 years old	48	96.0%	0	0.0%	1	2.0%	1	2.0%	
	>45 years old	19	95.0%	0	0.0%	1	5.0%	0	0.0%	
Education	Diploma	84	94.4%	1	1.1%	3	3.4%	1	1.1%	0,939#
	Bachelor	102	93.6%	4	3.7%	3	2.8%	0	0.0%	
	Master	3	100.0%	0	0.0%	0	0.0%	0	0.0%	
Marital status	Married	139	92.7%	5	3.3%	5	3.3%	1	0.7%	0,164#
	Single	45	97.8%	0	0.0%	1	2.2%	0	0.0%	
	Widowed	5	100.0%	0	0.0%	0	0.0%	0	0.0%	
Work unit	Covid wards	38	100.0%	0	0.0%	0	0.0%	0	0.0%	0,085$
	Non-covid wards	151	92.6%	5	3.1%	6	3.7%	1	0.6%	
Length of work	<1 year	24	92.3%	1	3.8%	1	3.8%	0	0.0%	0,312#
	1-5 years	57	91.9%	3	4.8%	2	3.2%	0	0.0%	
	6-10 years	30	93.8%	1	3.1%	1	3.1%	0	0.0%	
	11-15 years	52	96.3%	0	0.0%	1	1.9%	1	1.9%	
	16-20 years	7	100.0%	0	0.0%	0	0.0%	0	0.0%	
	>20 years	19	95.0%	0	0.0%	1	5.0%	0	0.0%	
Living with elderly	Yes	72	98.6%	0	0.0%	0	0.0%	1	1.4%	**0,041$***
	No	117	91.4%	5	3.9%	6	4.7%	0	0.0%	
Being pregnant or breastfeeding	Yes	37	86.0%	3	7.0%	2	4.7%	1	2.3%	**0,013$***
	No	152	96.2%	2	1.3%	4	2.5%	0	0.0%	
Having comorbidities	Yes	30	90.9%	0	0.0%	3	9.1%	0	0.0%	0,383$
	No	159	94.6%	5	3.0%	3	1.8%	1	0.6%	
Having a history of covid	Yes	47	97.9%	1	2.1%	0	0.0%	0	0.0%	0,186
	No	142	92.8%	4	2.6%	6	3.9%	1	0.7%	
Depression in the last year	Yes	0	0.0%	0	0.0%	0	0.0%	0	0.0%	-
	No	189	94.0%	5	2.5%	6	3.0%	1	0.5%	

*) significant p<0,05, #) Spearman Correlation, $) Mann-Whitney.

Based on the results of the bivariate analysis in Table 2 shows that there was a relationship between gender (p = 0.039), living with the elderly (p = 0.041), and being pregnant or breastfeeding (p = 0.013) with nurses' anxiety in caring for confirmed COVID-19 patients (p<0.05). The majority of respondents experienced mild anxiety in men (n=14, 82.4%) more than in women (n=175, 95.1%). Most of the respondents experienced mild anxiety with those who lived with the elderly (n=72, 98.6%) more than those who did not live with the elderly (n=117, 91.4%). The majority of respondents experienced mild anxiety in respondents who were pregnant or breastfeeding (n=37, 86%) more than those who were not pregnant (n=152, 96.2%). There was no significant relationship between age, education, marital status, work unit, length of work, comorbidities, and having a history of covid with nurses' anxiety (p> 0.05%).

Multivariate analysis with the Linear Regression Backward method was used to determine the independent variables whose influence was significant by including all variables and eliminating the least significant independent variables one by one. The final result of this method considers the magnitude of the significance of the analysed variables. The Backward method was chosen because it uses stages of analysis starting from the insignificant variables removed and so on until the remaining significant variables that can be seen in Table 3.

Table 3. Results of multivariate linear regression test dominant factors causing nurses' anxiety in caring for patients with confirmed COVID-19.

		B	p	95.0% Confidence interval for B	
				Lower bound	Upper bound
Step 1	(Constant)	1.277	.000	.631	1.923
	Gender	-.204	.066	-.422	.014
	Marital status	-.015	.808	-.139	.108
	Work unit	.123	.122	-.033	.278
	Living with elderly	.097	.115	-.024	.218
	Being pregnant/breastfeeding	-.175	**.023**	-.326	**-.025**
	Having a history of covid	.094	.177	-.043	.230
Step 2	(Constant)	1.275	.000	.631	1.920
	Gender	-.209	.055	-.423	.004
	Work unit	.125	.108	-.028	.279
	Living with elderly	.096	.117	-.024	.217
	Being pregnant/breastfeeding	-.181	**.014**	-.325	**-.037**
	Having a history of covid	.092	.181	-.043	.228
Step 3	(Constant)	1.418	.000	.808	2.029
	Gender	-.216	**.048**	-.430	**-.002**
	Work unit	.134	.086	-.019	.287
	Living with elderly	.102	.098	-.019	.222
	Being pregnant/breastfeeding	-.175	**.017**	-.320	**-.031**

In the multivariate analysis, it was found that in the first step, only the variable of being pregnant or breastfeeding had a significant effect on anxiety p = 0.023, while gender, marriage, work unit, living with the elderly, and history of covid were not significant (p>0.05). In the second step, by excluding marriage because it has the largest p-value in the first step, it was found that only the variable of being pregnant or breastfeeding had a significant effect on anxiety p = 0.014. Meanwhile, in the last step, it was known that the factors that had a significant effect on anxiety were gender p = 0.048 and being pregnant or breastfeeding p = 0.017. The regression coefficients for gender and being pregnant or breastfeeding were negative, indicating that men more often felt anxious than women and respondents who were pregnant or breastfeeding more often felt anxious than those who were not pregnant.

4. Discussion

The results in this study have similarities with previous studies regarding the level of anxiety of health workers while caring for COVID-19 patients, where most of the respondents experienced mild anxiety. A cross-sectional study in China cited similar findings as 92 nurses in type A hospitals in Anhui Province, China[7] and 586 nurses in East China, and 131 nurses in Eastern Saudia Arabia[4] reported mild anxiety in caring for patients during the pandemic. Similar results were found in a study of 84 nurses in Surabaya, Indonesia, who reported mild anxiety in caring for COVID-19 patients during the pandemic. Although nurses' anxiety levels showed

low scores, nurses had a tendency to experience anxiety due to the impact of the COVID-19 outbreak. This was also due to the presence of infections among health workers, which had been reported along with the increase in workload, the number of patients, and infected people without symptoms which caused nurses' anxiety.[4]

In this study, there was a relationship between gender, living with the elderly, and being pregnant or breastfeeding with nurses' anxiety in caring for patients with confirmed COVID-19 ($p<0.05\%$). However, only gender and pregnancy conditions were the dominant factors influencing nurses' anxiety in caring for COVID-19 patients. This finding was similar to another study in which the anxiety of health workers, one of which nurses were influenced by gender and the condition of being pregnant or breastfeeding. There was no significant difference between the factors of age, education, marital status, work unit, length of work, having comorbidities, and a history of covid with nurses' anxiety. This could happen due to increasing knowledge about COVID-19, adaptation to pandemic crisis situations, hospital support related to the provision of personal protective equipment, also training and interventions to prevent the spread of covid in the hospital.[5]

Another study investigated similar results regarding the anxiety of health workers during the COVID-19 outbreak, where the male gender experienced increased anxiety. This finding was interesting because other studies reported different results where female respondents felt more anxiety than men and the majority of women had a higher prevalence of diagnosed psychological symptoms than men, and women were more likely to self-report their psychological problems than men[8], even the risk of experiencing anxiety disorders in women was twice as high. The increase in anxiety in male respondents was due to prolonged contact with patients, so there was a fear of being infected, working under excessive workloads, having a role in child care, and having priorities for the health of family members as the main role as the head of the family.[6]

Respondents who were pregnant or breastfeeding were more often feel anxious about caring for patients with confirmed COVID-19 than those who were not pregnant. Another study reported similar results, in which there was a relationship between being pregnant or breastfeeding with nurses' anxiety in caring for COVID-19 patients. Previous studies have shown that anxiety is one of the most common negative emotions during pregnancy, especially during the third trimester.[7-10] During the COVID-19 pandemic, there was a significant increase in the anxiety of pregnant women, up to 59% based on cohort studies[6], as well as fear of infecting the fetus in the womb. These results indicated that anxiety increased due to the consequences of worrying about the COVID-19 pandemic. The increased anxiety could happen due to the reality that nurses on duty in non-covid units also provided care for patients with confirmed COVID-19. As direct caregivers of patients, nurses have more opportunities for close contact with covid patients, a greater risk of infection, and physical and mental burden. Therefore, psychotherapeutic intervention is needed to help reduce nurses' anxiety.

5. Conclusion

There is a significant relationship between gender and the condition of being pregnant or breastfeeding with nurses' anxiety in caring for patients with confirmed COVID-19. The majority of nurses experienced mild anxiety. The psychological response of nurses during the pandemic is increasing due to fear of transmission to their family members.

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