

The Effect of COVID-19 Pandemic on Anxiety Disorders among Workers in a Hospital in Balikpapan, East Kalimantan

Dewi S. Soemarko, MD, MS, PhD,^{1,2} Mohamad W. Sulistomo, MD,³
Liem J. Fuk, MD,⁴ Nuri Purwito Adi, MD, MSc^{2,3} and Muhammad Ilyas, MD^{2,3}

¹Occupational Medicine Master Program, Faculty of Medicine, Universitas Indonesia

²Occupational and Environmental Health Research Center IMERI, Faculty of Medicine, Universitas Indonesia

³Occupational Medicine Specialist Program, Faculty of Medicine, Universitas Indonesia

⁴Department of Occupational Health and Safety, Faculty of Medicine and Health Science, Universitas Kristen Krida Wacana

ABSTRACT

Introduction. During the global COVID-19 pandemic, health workers were found to have a higher prevalence of anxiety disorder compared to non-health workers. Anxiety disorder that occurs chronically have a 25% chance to become a major depression disorder.

Objective. The aim of this study is to understand the anxiety condition and related risk factors among workers in a Balikpapan hospital during the COVID-19 pandemic.

Method. The design of this research used a cross sectional method that involved 279 respondents who are workers in a Balikpapan hospital. The study used SPSS version 20.0, using the chi square and Fisher's Exact test for the bivariate analysis, and the logistic regression with enter method for the multivariate analysis.

Results. The study shows that using the General Anxiety Disorder 7 (GAD-7) questionnaire from 279 hospital workers, there were 10.8% with mild-, 1.45% with moderate-, and 0.4% with severe anxiety disorder. A significant relation was found between anxiety disorder and risk factors such as being a health worker with $p=0.001$ and a 4.8 OR_{adj} (95% CI: 1.9-12.3), working in areas with high risk of transmitting COVID-19 with $p=0.04$ and a 5.1 OR_{adj} (95% CI: 1.0-24.2), and workers who are being quarantined with $p=0.001$ a 10.5 OR_{adj} (2.6-42.3) after being adjusted by age and gender variables.

Conclusion. Significant relations were found between anxiety disorder among hospital workers with risk factors such as being health workers, working in areas with high risk of transmitting COVID-19, and workers who are being quarantined. Researchers strongly advise health providers to do regular monitoring and seek moral support especially for workers who have higher risk of anxiety disorder.

Keywords: Anxiety Disorder, hospital workers, COVID-19, GAD-7

INTRODUCTION

Health workers have the duty to provide care to COVID-19 patients. Every day, they are at high risk of being infected by the SARS-CoV-2 virus. This risk is considered to be a mental stressor for the hospital workers due to the following reasons - afraid of being infected, or infecting other people, especially their families. Exposure to such stressor for an unknown period of time could exceed their coping mechanism abilities and result in overload.¹

Research done in a hospital in China found that health workers are more at risk to develop insomnia, anxiety disorder,

Corresponding author: Mohamad W. Sulistomo, MD
Fakultas Kedokteran Universitas Indonesia
Jl. Salemba Raya No. 6,
Jakarta Pusat 10430, Jakarta, Indonesia
Email: mwsulistomo@gmail.com

depression, somatization disorder, and obsessive-compulsive disorder compared to non-health workers.² About 25% of anxiety disorder that occur chronically can develop into panic disorder or major depressive disorder.³ In Indonesia, this kind of study has never been conducted before. The aim of this study is to understand the work-related anxiety condition and risk factors during COVID-19 pandemic. This study is important as an early detection for anxiety disorder, and prevention for this early symptom to develop into more severe mental disorders.

In July 2020, data of Indonesia's countermeasure task force for COVID-19 announced that there were 17,660,523 confirmed cases, and 680,894 deaths globally. At the same time, Indonesia had 77,557 confirmed cases, and 5,593 deaths.⁴ Among the reported deaths globally, 3,000 were health workers; 61 deaths were health workers from Indonesia.⁵

Balikpapan city, which is in East Kalimantan province in Indonesia also has a fast-growing rate of confirmed cases. In August 2020, there were 455 confirmed cases and 14 deaths due to COVID-19.⁶ The hospital is located in the Southern part of Balikpapan where also one of the biggest oil refinery in Indonesia is located, which means that there is a mobilization of a high number of workers, so the rate of transmission in this area is likely to be high.

METHODS

This study used a cross-sectional descriptive analysis method, using primary data with an identity form to get the characteristics of respondents from July to August 2020, and the Generalized Anxiety Disorder 7 (GAD-7) questionnaire that was completed by the hospital workers. The calculated minimal total sample size was 196 subjects, but this study used total sampling method, and was able to get 279 subjects. The inclusion criteria for the samples were permanent employee, or contract employee from the hospital, who have been working in the same area for at least three months, and does not have a job that requires to work in more than one work area. Exclusion criteria were history of mental illness, history of organic diseases that can affect the mental condition, history of active drug abuse, or is in medical treatment that can affect the mental condition.

The dependent variable of this study is anxiety disorder that was obtained using the GAD-7 questionnaire completed by the hospital workers. The independent variables were age, gender, marital status, educational background, type of work, years of work, work zone, quarantine status, and night shift. The collected data were then analyzed using SPSS program version 20.0 with applying descriptive tests, chi-square test, and regression logistic test using enter method.

This study has obtained approval from the Ethics Committee of Faculty of Medicine Universitas Indonesia No. KET.141/UN2.F1.ETIK/PPM.00.02/2020.

RESULTS

Characteristics of Respondents' Individual- and Work-factors

Data were collected by handing out the questionnaire to all the workers through their head units. The head units then collected all the completed forms and submitted them directly to the researcher. Out of 514 hospital workers, 225 did not participate, 12 were excluded due to either having a history of certain illness, or does not meet the job criteria for this study. 279 respondents were then included in this study.

In this study, the age and years of work were converted to categorical variables. The age variable has a median (min-max) of 36 years (20-58 years), and years of work has a median of 12 years (0.5-32 years). Because of the abnormal data distribution on both variables, the median was used as a cut-off point for each category.

Work zone is the area of the work unit divided based on the level of transmission risk of COVID-19 virus. It was originally divided into three categories, which were red, yellow, and green zone. Red zone is the work area that has the highest risk of transmitting COVID-19. It is the area with confirmed or suspected cases of COVID-19. Yellow zone is the work area with medium risk of transmitting COVID-19. It is the area where patients who are not confirmed nor suspected cases of COVID-19 are cared for. Green zone is the work area that is not accessible to patients, usually the office and management area, so it has the lowest risk of transmitting COVID-19. In this study, for statistical analysis, the red and yellow zones were merged in the same category.

Quarantine status is the status of the workers that are quarantined in the house provided by the hospital for workers. This applies for all workers whether they care for a confirmed case or not. In the hospital, workers would usually stay in the quarantine house for 12 weeks: 10 weeks while they are on hospital duty, and the last 2 weeks that they are no longer on duty but have to wait until the incubation period is over, before returning to their families. They can spend time with their families until their next rotation at the hospital. This is their schedule for the next 12 months. The number of weeks may vary depending on the situation. The night shift of the workers is from 09:00 pm to 07:00 a.m.

Interpretation of Anxiety Disorder using GAD-7 Questionnaire

The interpretation of the worker anxiety disorder was based on the GAD-7 questionnaire's results. The interpretations of the GAD-7 scoring are: no anxiety disorder if the score is 0-4, mild anxiety disorder if the score is 5-9, medium anxiety disorder if the score is 10-14, and severe anxiety disorder if the score is 15-21.⁷ Table 1 shows the distribution of respondents based on the four categories.

Association of Risk Factor with Anxiety Disorder

Based on the bivariate test analysis using the chi-square test, or the Fisher's Exact test, it was found that there were significant associations between marital status, educational background, type of work, work zone, quarantine status, with Anxiety Disorder (Table 2). These risk factors were found to have p scores <0.05.⁸

Risk Factors that are most Associated with Anxiety Disorder

A multivariate test analysis was done including the five variables that showed significant association with anxiety

Table 1. Distribution of Respondents by Level of Anxiety Disorder

Criteria	Total (%) n=279
No anxiety disorder	244 (87.5)
Mild anxiety disorder	30 (10.8)
Moderate anxiety disorder	4 (1.4)
Severe anxiety disorder	1 (0.4)

Table 2. Association of Individual and Work Risk Factors with Anxiety Disorder

Variables	Anxiety disorder criteria (n=279)		Odds Ratio	95% CI		P value
	Anxiety disorder n (%)	No anxiety disorder n (%)		Lower Bound	Upper Bound	
Age						
≤36 years	19 (13.1)	126 (86.9)	0.899	0.442	1.831	0.769
>36 years	15 (11.2)	119 (88.8)				
Gender						
Female	26 (13.1)	172 (86.9)	1.209	0.540	2.709	0.644
Male	9 (11.1)	72 (88.9)				
Marital status						
Not married	11 (21.6)	40 (78.4)	2.338	1.061	5.151	0.031
Married	24 (10.5)	204 (89.5)				
Educational background						
No bachelor degree	23 (18.0)	105 (82.0)	2.537	1.208	5.332	0.012
With bachelor degree	12 (7.9)	139 (92.1)				
Type of work						
Health worker	13 (19.2)	140 (91.5)	2.278	1.097	4.732	0.024
Non-health worker	22 (17.5)	104 (82.5)				
Years of work						
≤12 years	19 (13.3)	124 (86.7)	0.870	0.427	1.771	0.701
>12 years	16 (11.8)	120 (88.2)				
Work zone						
Red-yellow	33 (14.5)	194 (85.5)	4.253	0.987	18.325	0.036
Green	2 (3.8)	50 (96.2)				
Quarantine status*						
Quarantined	8 (47.1)	9 (52.9)	7.737	2.756	21.721	<0.001
Not quarantined	27 (10.3)	235 (89.7)				
Night shift						
Yes	20 (21.3)	74 (78.7)	3.063	1.487	6.312	0.050
No	15 (8.1)	170 (91.9)				

*Fisher's Exact test

disorder and one other variable that had a $p < 0.25$, from the bivariate test analysis. The test used was regression logistic with enter method. It was adjusted by age and gender variables. The variables that show p score <0.005⁹ are type of work, work zone, and quarantine status. Table 3 shows the results of regression logistic test in this study.

DISCUSSION

Generalized Anxiety Disorder 7 (GAD-7) is a questionnaire most frequently used for screening a population for General Anxiety Disorder (GAD).⁹ GAD-7 is a diagnostic self-report scale for screening. It has a sensitivity of 89% and specificity of 82% for anxiety disorder.¹⁰

Most workers in the hospital showed no anxiety disorder based on the GAD-7 questionnaire (87.5%). From the 12.5% who had General Anxiety Disorder, only one (0.4%) respondent was in the severe anxiety disorder category, with a score of 15 which is the lower border line for severe anxiety disorder category. It can be assumed, that one of the reasons of this low prevalence is the hospital's prevention and control program for the workers that is implemented

Table 3. Risk Factors that are most Associated with Anxiety Disorder

	OR _{adj} (95% CI)	p value
Type of work		
Health worker	4.8 (1.9-12.3)	0.001
Non-health worker		
Work zone		
Red-yellow	5.1 (1.0-24.2)	0.040
Green		
Quarantine status		
Quarantined	10.5 (2.6-42.3)	0.001
Not quarantined		

during this pandemic. For example, the zoning area makes the workers in the green zone feel safer because it keeps them away from the patients or workers from the yellow-red zone area. The implementation of the control program in the hospital lowers the workers' stress level and anxiety to get infected by the COVID-19 or transmitting the disease to someone else outside the workplace. A similar study that was done by Wen-Rui Zang in China from February to March 2020 showed that out of all 2182 respondents, only 228 or 10.4% of the workers were found to have anxiety disorder based on the GAD-7 questionnaire.²

The risk factors that were found to have a significant association with anxiety disorder were quarantined workers ($p=0.001$, OR_{adj} 10.5, 95% CI= 2.6-42.3), being a health worker ($p=0.001$, OR_{adj} 4.8, 95% CI= 1.9-12.3), and working in the red-yellow zone (higher risk of COVID-19 transmission area) ($p=0.001$, OR_{adj} 5.1, 95% CI=1.0-24.3). The marital status, educational background, also had p score <0.2 in the bivariate test analysis, but did not show significant association when using the multivariate test analysis.

Quarantined status has the highest risk for having general anxiety according to this study. It shows that workers who are being quarantined has a 10.5 higher risk of having anxiety disorder compared to workers who are not quarantined. This could be because of being separated from their family, or having to adapt living with their co-workers for months, or it can be indirectly caused, because workers who are being quarantined are usually also at the most risk to get COVID-19. Also, quarantined workers automatically belong to the other two risk factors which are health workers, and working in the red-yellow zone area. One study done by Mohindra R in India, found that one of the reasons why health workers are worried about taking care of COVID-19 patients, is because they must be quarantined or isolated from their families.¹¹

Work zone also has a significant association with anxiety disorder. This matches with the results of a previous study by Wen-Rui Zang in China, that the workers who have greater risk of COVID-19 transmission in the work place, are more at risk of having anxiety disorder (OR 2.06, 95% CI, 1.28-3.32, $p<0.01$). This also corresponds to the results of Pace R

that the greater the stressor in the work place, the greater the chance of the worker to develop anxieties.¹² Another study in China by Kang L. found that the degree of contact was directly related to mental health disturbance in workers.¹³ This degree of contact is similar to the zoning area that is used in this study.

One study in India reported certain personal fears and worries regarding several factors - the possibilities of becoming source of infection, being isolated/quarantined, putting family members and other staff at risk, fear of improper use of personal protective equipment, fear of household problems due to lockdown, and medical insurance.¹¹

Other factors such as age, educational background, marital status, years of work do not show any significant association with anxiety disorder during this pandemic. This matches previous studies that also showed the same results. The study by Wen-Rui Zang showed that female workers have a higher risk of getting anxiety disorder during the COVID-19 pandemic (OR 1.8, 95% CI, 1.1-2.9, $p=0.002$),² but this study did not show the same results. Other risk factors that show significant association with anxiety disorder that are not accounted for in this study are having an organic disease, socio-economic status, and household circumstances. Marital status in Indonesia is considered to be not fully representative of household circumstances.

CONCLUSION

Distribution of the proportion of anxiety based on the work zone showed 33 (14.5%) are in the red-yellow zone, and 2 (3.8%) are in the green zone. Work-related risk factors that showed significant association with anxiety disorder are quarantined worker, health worker, and worker in red-yellow zone.

With these results, workers in the hospital are able to know their work-related risk factors to anxiety disorder. Workers can prepare more on how they will deal with their work situation and environment. By knowing this, hospitals should provide support, not only physical but mental health as well, to the workers, especially the ones that are more at risk. Workers should also be more conscious of their health, and report immediately if they have some concerns.

The researchers strongly advise the health providers to do regular monitoring and seek support especially to workers that have higher risk of anxiety disorder. Monitoring using questionnaires or by online consultation could be done before and after work for those who are quarantined. Hospitals should provide facilities in the quarantine house that could help the workers to relax and feel calm.

A team that is devoted to provide support to workers with mental issues is advised. The teams should consist of psychosocial response team, psychological intervention technical support team, psychological intervention medical team, and psychological assistance hotline team. All health providers should also keep a high-level of effort in protecting

the workers from transmitting COVID-19 in the workplace, in order to reduce the stress level. Future studies of qualitative research with quantitative methods for a more comprehensive understanding of the phenomenon of anxiety during the COVID-19 pandemic in workers is recommended.

Statement of Authorship

DSS and LJF contributed in the conception of study design, supervised data analysis, assisted and provided valuable insight in manuscript writing; MWS contributed in the study design, data collection and processing, conducted statistical analysis and wrote the first draft of the manuscript; NPA and MI provided valuable insight in manuscript writing.

Author Disclosure

All authors declared no conflicts of interest.

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