FACTORS AFFECTING ANXIETY AND DEPRESSION OF HEALTH WORKERS DURING THE FIRST WAVE COVID-19 PANDEMIC IN INDONESIA

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ABSTRACT

Background: During the COVID-19 pandemic, healthcare workers are expected to deal with patients' traumatic experiences and the unexpected loss of friends, family, and colleagues. As a result, they are affected by psychological distress, including depression, anxiety, and stress. This study aimed to determine the factors that influence anxiety and depression in health workers during the COVID-19 pandemic.
Subjects and Method: This time-series study was conducted on May 2-4, 2020, and September 3-30, 2020. A sample of 823 healthcare workers was selected for this study. The dependent variables were anxiety and depression. The independent variables were gender, age, resilience, area of residence, and COVID-19 zoning. Anxiety was measured by General Anxiety Disorder-7 (GAD-7). Depression was measured by Patient Health Questionnaire (PHQ-9). The data were analyzed using multiple logistic regression.
Results: The risk of moderate to severe anxiety increased with living in red-orange zone (OR= 0.35; 95% CI= 0.13 to 0.96; p= 0.041) and lack of resilience (OR= 4.51; 95% CI= 2.14 to 9.52; p<0.005), and statistically significant (p<0.05). The risk of moderate to severe anxiety increased with female gender (OR= 1.88; 95% CI= 0.70 to 5.09; p= 0.215), age <40 years (OR= 1.53; 95% CI= 0.61 to 3.84; p = 0.365), living in Java (OR= 2.52; 95% CI= 0.94 to 6.76; p= 0.067), but with statistically non-significant (p>0.05). The risk of moderate to severe depression increased with age <40 years (OR= 5.02; 95% CI= 1.15 to 22.00; p= 0.032), living in Java (OR= 5.53; 95% CI= 2.05 to 13.48; p= 0.001), lack of resilience (OR= 7.03; 95% CI= 3.47 to 17.67; p<0.001), and statistically significant (p<0.05).
Conclusion: The risk of moderate to severe depression increases with age <40 years, living in Java, lack resilience in health workers, and they are statistically significant. Likewise, the risk of moderate to severe anxiety increases with living in a red-orange zone, and lack of resilience, and they were statistically significant. The risk of moderate to severe anxiety increases with female gender, age <40 years, living in Java, but they are statistically non-significant.

Keywords: health workers, depression, anxiety, COVID-19 pandemic

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BACKGROUND

Health workers are all people who do work to improve health. Health workers work in emergency care facilities and long-term care, public health, community-based care, social care, home care, and other occupations in the health and social work sector (ILO,

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no date). Health workers and health services are at the forefront of their role when a particular disease (re)appears and spreads over a large area, known as a pandemic (Army, 2013).

A COVID-19 pandemic is an event that spreads the 2019 coronavirus (Coronavirus disease 2019) throughout the world. This disease is caused by a new type of coronavirus named SARS-CoV-2 (Gorbalenya et al., 2020). The COVID-19 outbreak was first detected in Wuhan City, Hubei Province, China, on 1 December 2019, and was declared a global pandemic by the World Health Organization (WHO) on 11 March 2020 (WHO, 2020). Until February 24, 2021, there were 111,419,939 confirmed cases of COVID-19 globally, of which 2,470,772 ended in death (WHO, 2021).

The first confirmed case of COVID-19 in Indonesia occurred in Depok, West Java, in March 2020. Two Indonesian citizens were infected by Japanese foreigners who came to Indonesia (Ihsanuddin, 2020). Ten months later, that number surpassed the million confirmed cases of COVID-19 (Kompas Team, 2021). This spike and increase in claims from time to time have made exceptional referral hospitals and general hospitals focus on services for handling cases of this infectious infection and its comorbidities by not eliminating health services for patients of other diseases. As of January 2021, at least ten provinces recorded an occupancy ratio of beds and ICU rooms (BOR) above 60 percent for COVID-19 patients. This means that more than half of the inpatient capacity treats COVID-19 patients (Kompas Team, 2021). The spike and addition of positive confirmed cases of COVID-19 occurred in the group of health workers in Indonesia. This is marked by an increase in the number of deaths of health workers who are confirmed positive for COVID-19. Since the pandemic period in 2020, the number of deaths from May to October was 15, 38, 60, 60, 71, and 74 cases. This increase will reach its peak in July 2021, which is 485 cases (Digital Center for Health Workers, 2021). The risk and occurrence of death, especially to the closest people, such as colleagues among health workers, is one of the significant risks faced during the pandemic.

Based on research during the SARS and Ebola pandemics, causing sudden, life-threatening symptoms of illness can cause tremendous stress on the health workforce (Liu et al., 2012). Increased workloads, physical exhaustion, inadequate personal protective equipment, nosocomial transmission, and difficulty making ethical decisions allow for dramatic effects on their physical and mental health. As a result, their ability to survive is affected by a state of isolation and loss of social support, relatives, and friends, as well as drastic changes that often disrupt their lives. Health workers are particularly vulnerable to mental health problems, including fear, anxiety, depression, and insomnia (Lung et al., 2009; Ping Wu et al., 2009). Based on the background description, this study aims to determine the factors that influence anxiety and depression in health workers during the COVID-19 pandemic.

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SUBJECTS AND METHOD

1. Study Design

This study uses a time-series research design. The study was conducted from 2 to 4 May 2020 and 3 to 30 September 2020.

2. Population and Sample

The sample is 823, with 568 respondents in the May 2020 stage and 255 respondents in the September 2020 data collection.

3. Study Variables

The dependent variable is anxiety and depression. The independent variables are gender, age group, resilience, area of residence, and COVID-19 zoning.

4. Operational Definition of Variable

a. Anxiety

Definition: a collection of symptoms that indicate an anxiety disorder based on the General Anxiety Disorder-7 questionnaire. Anxiety category if the score is at least 10.

Measurement Scale: Categorical

(0=anxious; 1=not anxious)

b. Depression

Definition: a collection of symptoms that indicate depressive disorder based on the Patient Health Questionnaire (PHQ-9). Depression category if the score is at least 10.

Measurement Scale: Categorical

(0= Depressed; 1=Not Depressed).

c. Gender

Definition: The difference between a woman and a man is biological from when a person is born.

Measurement scale: Categorical

(0=Female; 1=Male).

d. Age

Definition: Age of respondent by last birthday (in years). Age was grouped into two groups.

Measurement Scale: Categorical

(0= <40 years; 1=>40 years).

e. Resilience

Definition: An individual's ability (confidence and optimism) to adapt in the face of adversity during an outbreak.

Measurement Scale: Categorical

(0= No; 1= Yes).

f. House Ownership

Definition: The described economic level of residential ownership.

Measurement Scale: Categorical

(0=Family owned/rented/contracted; 1= Owned)

g. COVID-19 Zoning (Territory Severity)

Definition: The rate of COVID-19 cases that hit the area of residence, identified using report data on the number of cases per province from the COVID-19 Handling Task Force as of May 4, 2020-30 September 2020 (end of the online survey).

Measurement Scale: Categorical

(0= Orange: 501-2000 cases/Red; >2000 cases, 1=Green: 1-100 cases/ Yellow: 101-500 cases).

5. Instruments Study

Anxiety was measured by General Anxiety Disorder-7 (GAD-7). Depression was measured by the Patient Health Questionnaire (PHQ-9).

6. Data analysis

Data were analyzed using chi-square and multiple logistic regression.

7. Research Ethics

The ethical approval was obtained from the Research Ethics Commission of the NIHRD of Ministry of Health number LB.02.01/2/KE 326/2020.

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RESULT

The research results section includes univariate analysis, bivariate analysis, and multivariate analysis for each variable.

1. Univariate Analysis

Table 1. Frequency distribution of gender, age group, education level, housing status, area of residence, zoning status, and resilience

Variable	Frequency	Percentage
Gender		
Female	620	75.3
Male	203	24.7
Age		
≤ 40 years	626	76.1
>41 years	197	23.9
Education		
≤ Baccalaureate	297	36.1
>Bachelor	526	63.9
House Ownership		
Contract/rent/family-owned/office	321	39.0
Owned	502	61.0
Living Area		
Java Island	354	43.0
Outside of Java Island	469	57.0
Zoning Status (Beginning Pandemic)		
Red-orange	407	49.5
Yellow – Green	416	50.5
Resilience		
No	177	21.5
Yes	646	78.5

The results show that most health workers are female, namely 620 (75.3%). At the same time, the male gender was 203 (24.7%). Health workers who have an age <40 years are 626 (76.1%). Meanwhile, age >41 years were 197 (23.9%). Health workers with education level above bachelor's degree are 526 (63.9%), while education level below baccalaureate (D3) is 297 (36.1%). 502 health workers (61.0%) still have their own house, while 321 (39.0%). Health workers who live in areas outside of Java island are 469 (57.0%), while those who live on the island of Java are 354 (43.0%). Health workers who live in areas with yellow-green zoning status are 416 (50.5%), while those with red-orange zoning status are 407 (49.5%). Health workers with resilience are 646 (78.5%), while those who do not have resilience are 177 (21.5%).

2. Bivariate Analysis

Bivariate analysis was conducted to determine the relationship between the dependent variable, namely anxiety, and depression. The independent variables are gender, age, resilience, area of residence, and COVID-19 zoning determine the variables that enter into the multivariate model. This bivariate statistical test uses the chi-square test.

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Table 2. Factors that affect the anxiety of health workers in the early days of the COVID-19 pandemic

Variable	Anxiety Moderate to Severe		OR	p	Anxiety Low		OR	p
	n	%			n	%		
Gender								
Female	28	4.6	2.09	0.063	207	34.2	1.76	0.003
Male	5	2.5			47	23.5		
Age								
≤40 years	27	4.4	1.48	0.288	207	33.8	1.63	0.010
>41 years	6	3.1			47	24.4		
Education								
≤Bachelor	10	3.4	0.87	0.656	87	30.0	0.88	0.425
>Bachelor	23	4.5			167	32.4		
House Ownership								
Contract/rent	26	5.3	3.38	0.001	7	2.2	1.33	0.073
Owned	7	2.2			91	28.5		
Living Area								
Java Island	16	4.6	1.24	0.464	120	34.6	1.31	0.082
Outside of Java Island	17	3.7			134	29.2		
Zoning Status (Early Pandemic)								
Red-Orange	14	3.5	1.18	0.569	133	33.7	1.20	0.232
Yellow-Green	19	4.6			121	29.4		
Resilience								
No	14	8.3	4.97	<0.001	78	46.4	2.58	<0.001
Yes	19	3.0			176	27.6		

Table 3. Factors influencing depression of health workers in the early days of the COVID-19 pandemic

Variable	Depression Moderate to Severe		OR	p	Depression Low		OR	p
	n	%			n	%		
Gender								
Female	21	3.5	1.38	0.380	136	22.6	1.59	0.033
Male	6	3.0			31	15.6		
Age								
≤40 years	25	4.1	4.17	0.007	141	23.2	2.05	0.002
>41 years	2	1.0			26	13.3		
Education								
≤ Baccalaureate	10	3.5	1.10	0.757	51	17.7	0.74	0.106
>Bachelor	17	3.3			116	22.6		
House Ownership								
Contract/Rent	23	4.8	4.44	<0.001	115	23.8	1.68	0.006
Owned	4	1.3			52	16.4		
Living Area								
Java Island	21	6.1	2.63	0.002	74	21.5	1.15	0.436
Outside of Java Island	6	1.3			93	20.3		
Zoning Status (Early Pandemic)								
Red-Orange	21	5.3	2.46	0.005	87	22.0	1.22	0.263
Yellow-Green	6	1.5			80	19.7		
Resilience								
No	15	9.0	3.28	<0.001	59	35.3	3.03	<0.001
Yes	12	1.9			108	17.0		

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3. Multivariate Analysis

Multivariate analysis is an analysis to find out the dependent variables are anxiety and depression, with the independent variables being gender, age, resilience, living area, and COVID-19 zoning.

Table 4. The effect of gender, age, area of residence, zoning status, and resilience on the anxiety of health workers in the early wave of COVID-19 pandemic

Variable	Moderate to Severe Anxiety				Low Anxiety			
	OR	95% CI		p	OR	95% CI		p
		Lower limit	Upper limit			Lower limit	Upper limit	
Gender								
Female	1.88	0.69	5.09	0.215	1.51	1.02	2.21	0.037
Male								
Age								
≤40 years	1.53	0.61	3.84	0.365	1.55	1.10	2.27	0.024
>41 years								
Living Area								
Java Island	2.52	0.94	6.76	0.067	1.31	0.86	1.99	0.218
Outside of Java Island								
Zoning Status								
Red-Orange	0.35	0.13	0.96	0.041	0.89	0.58	1.35	0.573
Yellow-Green								
Resilience								
No	4.51	2.14	9.52	0.005	2.53	1.75	3.65	0.005
Yes								

The results of the logistic regression on the dependent variable of anxiety showed that the most dominant variable influencing the anxiety of health workers in the early days of the COVID-19 pandemic was the resilience variable with values (OR= 4.51; 95%CI= 2.14 to 9.52; p<0.005), meaning that health workers who do not have resilience are at risk of experiencing moderate-to-severe anxiety 4.51 times compared to health workers who have resilience.

Table 5. The effect of age, area of residence, and resilience on the anxiety of health workers in the early days of the COVID-19 pandemic

Variable	Moderate to Severe Depression				Low Depression			
	OR	95% CI		p	OR	95% CI		p
		Lower limit	Upper limit			Lower limit	Upper limit	
Age								
≤40 years	5.02	1.15	22.00	0.032	2.10	1.32	3.34	0.002
>41 years								
Living area								
Java Island	5.53	2.05	13.48	0.001	1.15	0.80	1.64	0.453
Outside of Java Island								
Resilience								
No	7.83	3.47	17.67	0.005	3.09	2.09	4.58	0.005
Yes								

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The results of the logistic regression on the dependent variable of depression showed that the most dominant variable affecting depression in health workers in the early days of the COVID-19 pandemic was the resilience variable with values (OR= 7.83; 95%CI= 3.47 to 17.67; p< 0.005), meaning that health workers who do not have resilience are at risk of experiencing moderate to severe anxiety 7.83 times compared to resilient health workers.

DISCUSSION

The main finding of this analysis was that health workers without (low) resilience had a high risk of experiencing moderate to severe anxiety (OR=4.51; 95% CI= 2.32 to 9.52) and moderate to severe depression (OR= 7.83; CI95). %=3.47 to 17.67). Meanwhile, other findings are the large proportion of moderate to severe anxiety in health workers (6.1%; 95% CI = 4.40 to 7.70) and depression (5.8%; 95% CI = 4.20 to 7.40) at the beginning of the COVID-19 pandemic in Indonesia. If we compare surveys at the beginning of the pandemic in Peru using the same instruments, the results are not much different. The proportion of anxiety is moderate (5.7%), severe (2.9%), moderate depression (6.9%), weight (0.6%) (Huarcaya-Victoria et al., 2020).

The proportion of moderate to severe anxiety and depression is lower than that in India, where anxiety is 17.7%, and depression is 11.4%, using the same online methods and measurement instruments as this study (Wilson et al., 2020). This study in India was conducted when the country was in a critical period (first peak), in which the health workforce was very overwhelmed at that time. This can make the proportion of Anxiety and Depression bigger. At the same time, our study is still at the pandemic's beginning. The difference in survey timing and case-level waves allows slightly different results.

Health workers involved in handling COVID-19 sufferers are, of course, the group most at risk of contracting it. Fear of catching the disease, transmitting it to family, having to stay at work (not going home), thinking about how to be treated/isolated when infected, and imagining the response of the surrounding community, making energy These health professionals are at risk for mental disorders (Fuchs et al., 2020). Especially medical personnel, coupled with the "moral injuries" they face when treating COVID-19 patients, decide which COVID-19 patients should receive the limited number of life-saving therapies at the expense of other dying patients (Greenberg et al., 2020).

Positive adaptation to survive adversity is a form of resilience in thoughts, behaviors, and actions (Fuchs et al., 2020). Resilience is built from a person's awareness of his existence, optimism in life, and the belief that problems can be solved (Giddie et al., 2017). One of the characteristics of a resilient person is to have optimism and internal control in the face of adverse events (Gheshlagh et al., 2017). Resilience is also related to coherence, namely seeing the meaning of life so that it can adapt to adversity (Fuchs et al., 2020). A person's resilience in dealing with problems is also bridged

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by other protective factors, self-efficacy, social support, work, higher education, self-esteem, positive social orientation, asking for help, stress management, locus of control, coping, and older age. Protective factors play an essential role in building resilience (Gheshlagh et al., 2017).

People with a strong sense of self-efficacy dare to overcome adversity. Management needs to pay attention to increasing self-confidence in dealing with stress-reducing anxiety (Gheshlagh et al., 2017). Anxiety, emotional exhaustion, depression in health workers can be "burnout" psychological symptoms. In addition to signs of suspicion, irritability, helplessness, easy crying, decreased self-esteem and self-confidence, difficulty concentrating, and apathy towards patients (Kisa, 2020).

At the beginning of the pandemic, health workers were a group that experienced a heavy burden because they were faced with uncertainty, exacerbated by high patient mortality and the unknown mode of transmission. Meanwhile, health workers are at the forefront of patient care. They work 24 hours, facing the demands of leaders, superiors, and patients' families. Health workers are prone to experiencing physical and emotional exhaustion, including burnout, worry, anxiety, depression which can affect their performance. In addition to their workload, they are also faced with the family's burden, the lack of financial support while the family's needs must be met. Also, they are a high-risk group for infection. However, they fulfill their responsibilities as health workers. The research analysis results conducted at the beginning of the pandemic show that health workers with resilience are more or less at risk of experiencing severe depression. These results imply the importance of the resilience capabilities of health workers.

The red-orange zone was identified as a protective factor against the incidence of anxiety and depression, which means that health workers in the red and orange zones have better resilience than health workers in the yellow-green zone. Based on these results, factors contributing to or supporting better resilience among health workers in the red-orange zone can be identified. Meanwhile, the higher risk of health workers experiencing anxiety depression can be an alarm for regional leaders, hospitals, and other health care facilities to explore the factors that cause low resilience among health workers in Java. It is necessary to identify factors contributing to the quiet resilience of health workers in Java while studying the better resilience of health workers outside Java. The boom in Covid-19 patients/cases can be one contributor that weakens the resilience of health workers in Java.

As a preventive measure, it is essential for management to disseminate the risks that health workers will face. All health workers must be prepared for what they encounter during the COVID-19 pandemic. It is necessary to properly prepare staff for the work and challenges to reducing the risk of mental health problems (Greenberg et al., 2020). Furthermore, it is essential as an initial step to identify/detect the

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mental health condition of health workers and their causal factors. Provide a forum for healthcare staff from all backgrounds to safely discuss the emotional and social challenges of caring for patients. Discussions should be led by the team leader and can be conducted remotely if needed. The team leader should reach out to staff who are "too busy" or repeatedly "unavailable" to attend these discussions. Most people find that support from colleagues and direct line managers protects their mental health. Staff members who constantly avoid meetings or become overly stressed may need sensitive discussion and help from experienced people such as their team leader trained peer support. If the stress they feel is severe or persistent, they should be actively supported or, in more severe cases, referred to a mental health support professional (Greenberg et al., 2020).

Protective factors that can be built are from the individual side and the management of the work environment. The health workers themselves pay attention to building the meaning of life, believing that there are opportunities to learn and grow from life experiences, both positive and negative. In addition, self-care must always be maintained, such as physical activity (Heath and Sommer, 2020). Studies have shown physical activity to have a good effect on reducing fatigue levels in doctors. Adequate sleep duration is essential in preventing fatigue and increasing self-restraint. Disruption of the circadian rhythm causes short- and long-term consequences, including disturbed sleep and daytime sleepiness, decreased logical reasoning, and reduced alertness.

From the environmental side, social support can be built. Evidence shows that physicians with strong, personally, and professionally meaningful relationships are happier and lower burnout risk. Cultivating meaningful relationships and solid social networks is important; However, these are interdependent on organizational factors that facilitate work-life balance and professional connectedness. The opening of a regular weekly reflection forum (e.g., 1 hour per week) to share concerns share experiences of success in professionalism can help find joy amid work pressure and reinforce goals to be achieved (Heath and Sommer, 2020).

Leaders must not forget to manage expectations clearly and compasssionately, clarify working hours, and provide adequate resources, including fair distribution of effective personal protective equipment. Leaders must pay attention to work schedules that can maintain physical endurance by allowing good sleep and providing access to rest areas for doctors in hospitals who work long hours or multiple shifts (Heath and Sommer, 2020).

The units of analysis in this study are those who claim to work in existing health care facilities, such as public health centers, clinics, and hospitals. The survey was designed specifically for health workers and the general public, including those dealing with the COVID-19 pandemic in the first year of the pandemic. The unavailability of the profession among health workers related to the workload in

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providing services to COVID-19 patients is a limitation in this study.

The concept of resilience in this study is only based on the respondent's acknowledgment of 2 questions that describe whether they are confident and optimistic in facing the beginning of this COVID19 pandemic. This resilience question is not a standard instrument such as Anxiety and Depression, so it is possible that it cannot be compared between studies that have legal definitions.

Resilience and respondent characteristics have a role in anxiety and depression in health workers. There is a pattern where the lower resilience is in line with the more severe depression or anxiety in health workers. It is important to develop resilience in health workers, especially during a pandemic or crisis. Furthermore, management plays a vital role in monitoring the mental health condition of health workers and facilitating the fostering of worker resilience.

ABBREVIATIONS

HCWs: Healthcare Works; COVID-19: Corona Virus Disease 2019; GAD: General Anxiety Disorder; PHQ: Patient Health Questionnaire; OR: Odds ratio; NIHRD: National Institute of Health Research and Development.

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AUTHORS CONTRIBUTIONS

LI designed the proposal and drafted the manuscript. RM ran and analyzed the data. SI analyzed the data. All authors have read and approved the manuscript.

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CONFLICT OF INTEREST

The authors declare no competing interests.

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