The Risk of Depression Among Health Workers During the Covid-19 Pandemic: A Study at Type B Hospitals in Indonesia Using PHQ-9

DOI : https://doi.org/10.22435/hsji.v14i1.6474

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Received: December 29, 2022; Revised: January 18, 2023; Accepted: January 19, 2023

Abstract

Background: Hospital workers are vulnerable in the fight against COVID-19 and may experience significant psychological and mental health consequences. Depression is one of the emotional and mental disorders that can affect the health services provided by hospital workers. This study aimed to determine the relationship between occupational factors and other factors towards the risk of depression during the Covid-19 pandemic among workers at type B hospital.

Methods: This study is a cross-sectional study using secondary data, a total of 669 workers (22-59 years age) were included. Demographic variables and work-related variables were collected from the Human Resources Unit (HR) and the Occupational Safety and Health Committee Unit (K3RS) of a type B hospital. Their risk of depression was measured using Patient Health Questionnaire (PHQ-9) and occupational stress assessed by the Survey Diagnostic Stress (SDS). SPSS versions 27 was used to conduct data analysis.

Results: Prevalence of depression among workers in type B hospital is 15.1%. Multivariate logistic regression analyses show that role conflict stressors (OR 3.68, 95% CI = 1.69 – 8.01) were more important risk factor for depression than quantitative workload stressor and career development stressor.

Conclusion: A high prevalence of depression was found among workers in type B hospital during the COVID-19 outbreak. Paying attention to job role conflict at the workplace will be useful for decreasing the risk of depression. Regular mental health checks and counseling should be performed along with periodic health checks.

Keywords: depression, workers, hospitals, Covid-19, occupational factors, Indonesia

Abstrak

Latar belakang: *Pekerja di rumah sakit rentan dalam perang melawan COVID-19 dan mungkin mengalami gangguan emosional dan mental yang signifikan. Depresi merupakan salah satu gangguan emosional dan mental yang dapat memengaruhi pelayanan kesehatan yang diberikan oleh pekerja di rumah sakit. Penelitian ini bertujuan untuk mengetahui hubungan antara faktor pekerjaan dan faktor lain dengan risiko depresi pada masa pandemi Covid-19 pada pekerja di Rumah Sakit tipe B.*

Metode: *Penelitian ini merupakan penelitian analisis potong lintang dengan menggunakan data sekunder meliputi 669 pekerja di rumah sakit tipe B. Variabel demografi dan variabel terkait pekerjaan dikumpulkan dari Unit Sumber Daya Manusia (SDM) dan Unit Komite Keselamatan dan Kesehatan Kerja (K3RS) Rumah Sakit tipe B. Risiko depresi diukur dengan menggunakan Kuesioner Kesehatan Pasien (PHQ-9) dan stres kerja yang dinilai dengan Survey Diagnostic Stress (SDS). Analisis data menggunakan SPSS Statistics versi 27.*

Hasil: *Prevalensi risiko depresi pada pekerja di RS tipe B adalah 15,1%. Analisis regresi logistik multivariat menunjukkan bahwa stresor konflik peran (OR 3,68, 95% CI = 1,69 – 8,01) merupakan faktor risiko yang paling dominan terkait risiko depresi daripada stresor beban kerja kuantitatif dan stresor pengembangan karir.*

Kesimpulan: *Prevalensi depresi yang tinggi ditemukan pada pekerja di rumah sakit tipe B selama wabah COVID-19. Memperhatikan konflik peran pekerjaan di tempat kerja akan berguna untuk mengurangi risiko depresi. Pemeriksaan dan penyuluhan kesehatan jiwa secara berkala harus dilakukan bersamaan dengan pemeriksaan kesehatan berkala.*

Kata kunci: *depresi, pekerja, rumah sakit, Covid-19, faktor pekerjaan, Indonesia*

INTRODUCTION

Coronavirus disease-2019 (COVID-19) is a disease caused by a new type of coronavirus known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and was recognized as a pandemic by the World Health Organization (WHO) on March 11, 2020. The increasing prevalence of cases of Covid-19 patients can cause various problems, including symptoms of mental health disorders in health workers. Depression is one of the emotional and mental disorders that can affect the health services provided by health workers. To ensure the health system can survive in dealing with future outbreaks, special attention needs to be paid to the mental health condition of health workers whose work is directly involved in handling infectious diseases.[1,2]

Type B Hospital is one of the Covid-19 referral hospitals in DKI Jakarta according to the Decree of the Governor of DKI Jakarta Number 987 of 2020 concerning the Designation of a Referral Hospital for the Management of Coronavirus Disease (COVID-19). Following the Technical Guidelines for Hospital Services During the Adaptation of New Habits by the Ministry of Health (2020) regarding the division of room zoning during a pandemic to prevent transmission of Covid-19 in hospitals. Hospital C as a Covid-19 referral hospital divides its service units into non-Covid-19 zones and Covid-19 zones, namely high-risk units, and red zones.[3]

A preliminary survey of depression risk was conducted in April 2020 on 206 workers who work in the Covid-19 zone of the type B hospital using the Patient Health Questionnaire (PHQ-9) questionnaire. The result showed that the prevalence of depression risk was 22.9%. Research conducted in Vietnam proved that depression was significantly associated with various factors, namely age, marital status, work profession, experiencing traumatic stress due to work, high risk of exposure to Covid-19, and workplace conditions.[4] There are not many studies that explain what occupational factors and what other factors contribute to the risk of depression in hospital workers in Indonesia. This study aims to determine the relationship between occupational factors (occupational stressors according to the Stress Diagnosis Survey questionnaire, work unit, years of service, job title, job category) and other factors (gender, age, marital status, education level) towards the risk of depression in workers at type B hospital that provides health services during the Covid-19 pandemic by using the Patient Health Questionnaire (PHQ-9). Through the data obtained from the study, it can be seen which factors are the most dominant in causing depression among hospital workers during the Covid-19 pandemic.It is hoped that there will be efforts from hospitals to minimize the adverse effects of depression on workers and determine what programs are appropriate to prevent depression.

METHODS

Subjects

This study uses a cross-sectional secondary data provided by Hospital Occupational Safety and Health Committee Unit (K3RS) and the Human Resources Unit (HR) type B hospital. The target population of this study was all health care facility workers in Indonesia who are involved in handling the Covid-19 pandemic, while the accessible population is all secondary data from workers recorded in August 2021. The sampling technique used in this study is by taking into account the inclusion and exclusion criteria. A total of 758 subjects were collected from secondary data provided by Hospital Occupational Safety and Health Committee Unit (K3RS) and the Human Resources Unit (HR) Hospital C. However, only 669 samples met the inclusion criteria and were analyzed.

Instruments

Occupational Stress

The measurement of the stress variable was carried out using the standard Diagnostic Stress Survey questionnaire consisting of 30 questions. This questionnaire was edited from the book Action on Stress at Work and has been developed by the Research and Development Agency of the Indonesian Ministry of Health.[5] This questionnaire has been validated and is considered quite accurate and can be used in Indonesia. In each question, there is a choice of answers which is a value scale of 1 to 7. Respondents will be asked to select those that are most suitable for assessing the condition as a source of stress. Each question is associated with an individually specific stressor level. Categories of measurement results are low stress (score <10), moderate stress (score 10-24), and severe stress (score >25).[5,6]

Depression Risk

The Patient Health Questionnaire-9 (PHQ-9) is the most frequently used psychometric instrument for screening for early detection of depression in primary health facilities. The PHQ-9 was chosen because it is simple, can be completed by patients in minutes, and

is assessed quickly by clinicians. PHQ-9 can also be used repeatedly, which can later show improvement or worsening of depression and its response to treatment. Assessments are scored by adding the entire number of questions from the questionnaire. Total scores ranged from 0 to 27, with higher scores indicating greater severity of depressive symptoms. In this study, the presence of depression risk was defined by a PHQ-9 score of ≥ 5. In Indonesia, in 2014 a study of validity and reliability testing on a large number of patients at the clinic (n = 10,000) for the PHQ-9 questionnaire was conducted by Nurul Fatimah. As a result, the question items are considered valid, and the Cronbach Alfa value = 0.74 which means that this instrument has good reliability.[7,8]

Statistical Analysis

Variables in this study are the risk of depression, occupational factors such as work stressors, work units, years of service, job category, job title, work shifts, and other factors such as age, gender, marital status, and education level. The normality test is only performed on variables with numerical data, not on variables with categorical data. Data were analyzed using SPSS for Windows (version 27), using univariate, bivariate and multivariate analyses. Chi square ($\chi 2$) test for categorical variables and the Mann-Whitney U test for continuous variables were used. Variables from bivariate analysis that showed a p-value of <0.25 were included for multivariate analysis. Binary logistic regression analysis was done to obtain the adjusted odds ratio of determinant factors established for clinically significant depression. A p-value <0.05 was considered to be statistically significant.

RESULTS

There were 669 questionnaires received in total by total sampling, all of which were completed and included in the final statistical analysis. The prevalence of workers at risk for depression during the pandemic was 15.1% (PHQ-9 score ≥5). The sample of this study was dominated by female (77.4%), married (51.1%), who have completed at least high school/ diploma (59.9%). The median age of respondents was 32 years with a range between 22 to 59 years. The majority came from non-covid-19 administrative work units (80.2%) with the median years of service around 7 years (ranging from 1 years to 35 years). They were health workers (69.7%), did shift work (77.3%), and are staff (83.9%). In addition, the most frequently experienced moderate-severe stress is a qualitative workload stressor (53.2%).

In the bivariate analysis according to the Mann-Whitney Test, there was a difference in risk of depression based on age (p=0.01) and working periods (p=0.01). Based on Table 1, it was found that status marital status did not cause depression, and was statistically significant.

Table 1. Relationship between Individual Factors and the Risk of Depression.

Variables	Depression Risk				OR	95% CI	P value
	Yes		No				
	n	%	n	%			
Gender							
Women	79	15.3	438	84.7	1.05	0.63-1.76	0.83[cs]
Men	22	14.6	129	85.4	1.00	Ref	
Marital Status							
Single/Widowed	65	19.9	261	80.1	0.47	0.30-0.73	<0.001[cs]
Married	36	10.5	306	89.5	1.00	Ref	
Education Level							
SMA/SMK/D3	61	15.2	340	84.8	0.98	0.63-1.51	1.00[cs]
D4/S1/S2/S3	40	15	227	85	1.00	Ref	
Working Units							
Covid-19	24	18	109	82	1.31	0.79-2.16	0.29[cs]
Non Covid-19	77	14.4	458	85.6	1.00	Ref	
Job Category							
Healthcare Workers	64	13.8	401	86.2	0.71	0.46-1.11	0.13[cs]
Non Healthcare Workers	37	18.2	166	81.8	1.00	Ref	
Job Title							
Head of Unit/Supervisor	14	13.1	93	86.9	0.82	0.44-1.50	0.52[cs]
Staff	87	15.5	474	84.5	1.00	Ref	
Shift Work							
Yes	78	15.1	438	84.9	0.99	0.60-1.65	1.00[cs]
No	23	15.1	129	84.9	1.00	Ref	

OR: prevalence odds ratio, CI: confidence interval, cs : Chi-Square Test, Ref : reference

Table 2. The Relationship between Occupational Stressor and Risk of Depression

Variables	Depression Risk				OR	95% CI	P value
	Yes		No				
	n	%	n	%			
Role Ambiguity Stressor							
Medium - Severe	74	22.3	258	77.7	3.29	2.05 – 5.27	< 0.001[cs]
Mild	27	8	310	92	1.00	Ref	
Role Conflict Stressor							
Medium - Severe	74	22.6	254	77.4	3.38	2.11 – 5.42	< 0.001[cs]
Mild	27	7.9	314	92.1	1.00	Ref	
Quantitative Workload Stressor							
Medium - Severe	62	19.4	257	80.6	1.92	1.24 – 2.96	< 0.001[cs]
Mild	39	11.1	311	88.9	1.00	Ref	
Qualitative Workloads Stressor							
Medium - Severe	73	20.5	283	79.5	2.62	1.64 – 4.18	0.003[cs]
Mild	28	8.9	285	91.1	1.00	Ref	
Career Development Stressor							
Medium - Severe	73	23.2	241	76.8	3.53	2.21 – 5.63	< 0.001[cs]
Mild	28	7.9	327	92.1	1.00	Ref	
Responbility toward others Stressor							
Medium - Severe	65	21.6	236	78.4	2.54	1.63 – 3.94	< 0.001[cs]
Mild	36	9.8	332	90.2	1.00	Ref	

OR: *prevalence odds ratio*. CI: *confidence interval.* cs : Chi square Test

Table 3. Multivariate Analysis

Variables	Depression Risk		P value	OR (95% CI)	P value	aOR (95%CI)
	Yes n (%)	No n (%)				
Role Conflict Stressor						
Medium - Severe	74 (22.6)	254 (77.4)	<0.001[cs]	(3.38) 2.11 – 5.42	0.001	3.68 (1.69-8.01)
Mild	27 (7.9)	314 (92.1)				
Quantitative Workload Stressor						
Medium - Severe	62 (19.4)	257 (80.6)	<0.001[cs]	(1.92) 1.24 – 2.96	0.006	2.71 (1.32-5.56)
Mild	39 (11.1)	311 (88.9)				
Career Development Stressor						
Medium - Severe	73 (23.2)	241 (76.8)	<0.001[cs]	(3.53) 2.21 – 5.63	0.002	2.86 (1.43- 5.72)
Mild	28 (7.9)	327 (92.1)				

Table 2 exhibits that statistically, the role of ambiguity stressors, conflict stressors, quantitative burden stressors, qualitative burden stressors, career development stressors, and responsibility stressors are significantly associated to the prevalence of depression risk.

Table 3 shows the results of the multivariate analyses focusing on determinant variables. When the conflict stressor is considered medium to severe, it had significant association with risk of depression with adjusted ratio of 3.68, CI 95% 1.69 – 8.01 than mild role conflict stressor. Medium severe quantitative workload stressor had significant association with risk of depression with adjusted ratio 2.71, CI 95% 1.32 – 5.56 than mild quantitative workload stressor and medium severe career development stressor had significant association with risk of depression with adjusted ratio 2.86, CI 95% 1.43 – 5.72 than mild career development stressor.

DISCUSSIONS

Prevalence of Depression in Workers at Type B Hospital during the Covid-19 Pandemic

In this study, the prevalence of depression risk among workers in type B hospital during the COVID-19 outbreak in 2021 was 15.1%. This prevalence is less than the previous year's, which was 22.9%. This can be understood due to the long-term adaptive response to the fight against the COVID-19 pandemic of the Indonesia health system in general, as well as frontline medical staff in particular. Specifically, the healthcare workforce who have been working at the hospital who were involved in the treatment of COVID-19 since the first wave of COVID-19 pandemic, by the second COVID-19 wave in Indonesia had extensive experience in managing COVID-19 patients. These findings contributed to the building of clear strategies to support and appropriately manage hospital healthcare workers involved in the treatment of COVID-19 patients, essential to ensure effective staff management and to engender trust in every work area.[4]

Relationship of Individual Factors with Depression Risk

There were individual risk factors that show significant association with the prevalence of depression risk. It was found that marital status did not cause risk of depression, and these results were statistically significant. The median age of workers who experienced the risk of depression was 29 years, with a range between 23 to 57 years. Among health care workers, being young often means low monthly salary, working on the night shift and lacking experience and knowledge in dealing with severe infectious diseases. This is in accordance with research conducted by Suryavanshi, Nishi et al (2020) stating younger age (≤30) and unmarried health care workers may be at the highest risk of experiencing depression.[9]

Furthermore, this study found no association between, gender or level of education and risk of depression compared to another study conducted in China by Lai et al. (2020) in which young female health care workers reported a higher risk of depression. This finding may be due to respondents working in public hospitals where health workers of different genders may experience the same stressors. In addition, the Covid-19 pandemic has created new problems that have never been faced before so that workers with high and low education, especially workers who work in hospitals experience the same negative psychological effects.[11]

Relationship of Occupational Factors with Depression Risk

The results of this study indicate that the occupational factor associated with the risk of depression was years of service. It was concluded that years of service was significantly related to the risk of depression ($p<0.05$) while working units, job title, job categorical, and shift work were not significantly associated with the risk of depression ($p>0.05$). In this study, the median years of service who experience the risk of depression was 5 years, with a range between 1 to 34 years. A study by Nayak, et al (2021) showed there was a significant association between depression and work experience ($p<0.05$), those who have longer work experience had less depression score than those with new work experience. In theory, the longer a person works, the skills will increase, and they are able to be adjust and face pressures, while shorter experience is constrained by the ability to adapt to the work environment.[10]

Relationship between Occupational Stressor and Depression Risk

Everything that are perceived as a threat or danger by an individual is defined as a stressor and either physical or psychological reactions against stressors are defined as an employee or individual stress. The risk of depression is generally based on the level of occupational stress and as Leunga (2009) emphasized that it can be said that high level of occupational stress is a factor to double the risk of depression. To understand if there exists a relationship between Occupational stressors and risk of depression among healthcare workers, influence of occupational stressors needs to be examined and measured. Occupational stressors are measured based on six

dimensions: role conflict, role ambiguity, quantitative workload, qualitative workload, career development and responsibility toward others.[2,12]

The results indicated that there is a relationship between the role conflict, role ambiguity, quantitative workload, qualitative workload, career development, and responsibility towards risk of depression. Our results showed a significant relationship between career development stressors and the risk of depression ($p<0.05$). Any uncertainty regarding a promotion, skill development, or increase in responsibilities that an individual can experience at work refers to career development stressor. As for career development stressor, before the COVID-19 pandemic, the relationships between depressive symptoms and career development stressor were reported among health care workers in public hospitals in Qatar.[14] In the U.S.A., another study among white-collar employees indicated that career development stressor has a substantial impact on depressive symptoms, and the threat of COVID-19 has a significant impact on depression. For hospital management, countermeasures for employees' occupational stress are needed during the COVID-19 pandemic.[15] Clarifying the job and company's prospects, even if the prospects are good or bad, are likely to reduce career development stressor. Fear of being out of business and becoming downsized; therefore, employment stability is likely the greatest protective factor against depressive symptoms.[16]

In this study through bivariate analysis, it was found that role conflict stressors and role ambiguity were significantly associated with the risk of depression ($p<0.05$). Similar findings have been reported in previous research by Xiao, Yuting, et al. (2022).[13] Among health care workers, explored how role conflict and role ambiguity was positively associated with depression. Leaders have to be able to analyze the situation faced during the COVID-19 pandemic carefully. When healthcare workers are confronted with role conflict and role ambiguity they may feel they cannot fulfill their job requirements. In the long run, healthcare workers with high role stress may experience emotional exhaustion and finally resulting in psychological distress such as depression.[17]

The occurrence of a pandemic increases the workload of hospital employees, both medical and non-medical personnel. The workload here includes quantitative and qualitative workloads. In this study, it was found that more workers experienced moderate-to-severe stress due to qualitative workload stressors who had a risk of depression (20.5%) when compared to quantitative workloads (19.4%). Both of these stressors have a significant relationship to the risk of depression ($p<0.05$). Healthcare workers that are overloaded with more work than they can handle with are more likely to suffer from psychological distress than healthcare workers who are assigned with appropriate workloads.[13] A pandemic renders essential workers' tasks more complex and difficult to manage, which may require them to have more energy to accomplish their work responsibilities. Such responsibilities may lead to depression. Healthcare workers may feel psychologically burdened over the responsibility of medical failures that may directly lead to health deterioration or death of their patients.[18] In addition, the increase in work hour and work intensity leads to the poor mental health of medical staff. The result of this study were consistent with previous research indicated that workload was associated with depressive symptoms among workers in Japan.[16] The latest estimates from the Labour Force Survey (LFS)[19] show the main work factors cited by respondents as causing work-related depression were workload pressures, including tight deadlines and too much responsibility and a lack of managerial support.

Responsibility stressor also has a significant relationship with the risk of depression in this study ($p<0.05$). Similar to research from Robert NJ et al. (2021) that the job responsibilities of hospital employees increase along with the increase in cases during the pandemic so responsibility stressors also play a role in the risk of depression. All workers at the hospital are included in the group of workers who are vulnerable to contracting the Covid-19 virus. This risk of transmission can occur due to direct contact with Covid-19 patients and visitors or contact with infected co-workers. This vulnerable situation can certainly pose a risk of depression because of the fear of contracting the Covid-19 virus and the risk of transmitting it to family members. The responsibility of all workers is to implement new policies set by hospital management such as using personal protective equipment (PPE) according to the

provisions and implementing infection prevention and control in services.[2,11,20]

Multivariable logistic regression analysis show that role conflict stressor was most associated with higher risk of experiences depression risk with an odds ratio value of 3.68 (1.69 – 8.01). These findings indicated that role conflict stressor appears in separate facets and may affect an employee healths. Nowadays, work environments seem to be unstable. It is becoming more important to clarify roles in the workplace, as well as employees' tasks, responsibilities, and goals. Managers should be trained to lead within a clear framework that eases employees' burden to fulfil their job position. The literature search showed that role conflict stressor appears throughout the world and is not unique to a certain country. The high prevalence of depression among employees, their suffering and the resulting costs provide additional reasons for companies to promote health in the workplace. Identifying crucial characteristics at work can be a first step towards an occupational health-preserving task design.[21,22]

Researchers are well aware that this research has several weaknesses, namely the cross-sectional study design, so the results obtained are only a momentary description by considering factors that exist at a certain time and cannot assess conditions before the study and are not followed by the continuation of the conditions of respondents.

In conclusion, this study presents that the individual factors that were found to be significantly related to risk of depression is age, whereas the occupational factors that were found to be statistically significantly related to the risk of depression were years of service and occupational stressor. The most dominant factor associated with the risk of depression among workers in type B hospital during the Covid-19 pandemic is a role conflict stressor. It is recommended for hospital management to provide a psychiatric screening examination during pre-employment health checks and periodic examinations so that the tendency for symptoms of emotional mental disorders can be detected early. As in role conflict stressors which are the most dominant factors at risk of depression, it is necessary to make a clear and appropriate job description as needed.

Ethical approval

This study was conducted in June 2022, and approved by Health Research Ethics Committee, Faculty of Medicine, University of Indonesia Number: KET-695/UN2.F1/ETIK/PPM.00.02/2022.

Acknowledgment

This research would not have been possible without the exceptional support from Master of Occupational Medicine, Department of Community Medicine, Faculty of Medicine, Universitas Indonesia and Hospital management for facilitating my thesis.

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