



Analysis of Mental Health Disorders Post Confirmation of Covid-19 in Health Workers Using Functional Status

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Abstract. Since the COVID-19 outbreak, most of the focus has been on limiting the spread of severe acute disease. COVID-19 is thought to have a significant impact on physical, cognitive, mental, and social health status, even in people with minor symptoms of sickness. In terms of medical workers killed by Covid-19, Indonesia ranks first in Asia and fifth worldwide. PTSD is more common in medical staff, and there is lack of studies of PTSD with functional status of medical workers following Covid-19 confirmation. The aims of this study were to examine the association between the occurrence of PTSD and functional status in medical staff following a verified PTSD diagnosis Covid-19. This cross-sectional analytic-descriptive study used a comparative quantitative approach with successive sampling at multiple centres in six hospitals in Sulawesi of Indonesia, from April to May 2022. The research participants were medical personnel who were positive for COVID-19. Data collection instruments used were demographic data questionnaires, an online PTSD Checklist for DSM-5 (PCL-5), and Post-COVID-19 Functional Status (PCFS) using Google Sheets. Hypothesis testing used an independent t-test and Chi-square test to examine the relationship between PTSD and functional status in medical personnel after a verified positive diagnosis of COVID-19. 14.8% of the 122 participants were determined to have PTSD. Furthermore, age, marital status, amount of COVID-19 symptoms experienced, length of stay, and challenges encountered all show a substantial link with the incidence of PTSD. There is a relationship between the incidence of PTSD and the functional status of medical personnel after confirmation of COVID-19. Further psychological interventions for health workers are urgently needed.

Keywords: COVID-19, functional status, healthcare staff, PTSD.

1 Introduction

The 2019 coronavirus disease (COVID-19) outbreak has led to a focus on preventing transmission and caring for critically ill patients. With over 88 million confirmed cases globally, it is clear that COVID-19 has significant impacts on physical, cognitive, mental, and social health, even in individuals with mild symptoms. Previous coronavirus outbreaks have been associated with persistent health issues such as pulmonary function impairment, muscle weakness, pain, fatigue, depression, anxiety, and vocational problems. Medical personnel have been at the forefront of the fight against COVID-19, but they may suffer from adverse psychological effects, including anxiety, fear, and stigmatization, which can affect the quality of care provided. A study conducted in China found that medical personnel exposed to the virus had an incidence of post-traumatic stress disorder (PTSD) of 16.8%, with avoidance symptoms being the most pronounced. The incidence of PTSD in Indonesian medical personnel has not been officially published, so a study was conducted to investigate the relationship between PTSD and functional status in post-confirmed COVID-19 medical personnel. The aims of this study are to examine the association between the occurrence of PTSD and functional status in medical staff following a verified PTSD diagnosis Covid-19 [1-3].

A large number of people were discharged from hospital after COVID-19 without systematic assessment of their recovery and need for rehabilitation or further investigation to detect complications. Early reports arise from an ongoing burden of symptoms called "Long-COVID", and changes in lung function and imaging [4]. The initial symptoms of coronavirus or COVID-19 can resemble flu symptoms, namely fever, runny nose, dry cough, sore throat, and headache. After that, symptoms may disappear and recover or even worsen. To determine the diagnosis of COVID-19 based on examinations such as Rapid tests as screeners, throat and nose swab tests to examine sputum samples (PCR tests), CT scans or chest X-rays to detect infiltrates or fluid in the lungs, routine hematology and CRP. Corona virus infection or COVID-19 cannot be treated optimally at this time, but there are several steps that doctors can take to relieve symptoms and prevent the spread of the virus, namely referring people with severe COVID-19 to undergo treatment and quarantine at a referral hospital, providing fever and pain relievers that are safe and according to the patient's condition, encouraging people with COVID-19 to carry out independent isolation and adequate rest, encouraging people with COVID-19 to drink lots of water to maintain body fluid levels [5].

PTSD is experienced by people with exposure to actual or threatened death, serious physical injury, or sexual violence. Such events are usually outside the range of normal human experience. Factors that influence the likelihood of developing PTSD include a person's age, history of psychiatric illness, level of social support, and proximity to the stressor. PTSD usually begins soon after the stressor is experienced, but the onset may be delayed for months or years. The disorder is chronic for many people, but symptoms fluctuate and usually worsen during periods of stress. A rapid onset of symptoms, a good level of premorbid functioning, strong social support, and the absence of psychiatric or medical comorbidities are factors that are associated with a favorable outcome. Predisposing factors such as personality traits (e.g., obsessive-compulsive,

asthmatic) or a history of neurotic disorders may lower the vulnerability threshold for the syndrome or exacerbate its course, but are not determinants of its occurrence [1].

In general, unless there is evidence of onset within 6 months of an unusually severe traumatic event, the disorder should not be diagnosed. A diagnosis may still be possible if the delay between the event and the onset of the disorder is greater than 6 months, provided that the clinical manifestations are typical and there are no other possible alternatives to the disorder (e.g., as an anxiety disorder, obsessive-compulsive disorder, or depressive episode). In addition, there must be evidence of the trauma in the form of recurrent memories, images, or dreams of the event. Emotional withdrawal, dissociation, and avoidance of stimuli that may remind them of the trauma are common, but not essential to the diagnosis. Autonomic disturbances, mood disturbances, and behavioral abnormalities all contribute to the diagnosis but are not essential. According to the DSM, the main elements of PTSD include re-experiencing the trauma through recurrent and intrusive dreams or thoughts, prolonged avoidance of stimuli associated with the event, negative mood changes (such as emotional numbing and feelings of separation from others), and changes in arousal and reactivity such as irritability and exaggerated startle response. DSM-5 defines two subtypes with dissociative symptoms when derealization or depersonalization is present and delayed expression when onset is delayed beyond 6 months after trauma. The increasing public health burden of mental illness will inevitably overwhelm the capacity of mental health services worldwide. The pandemic has also had a major impact on psychiatric research due to security concerns and containment efforts. The medium- and long-term consequences may be even more severe [6].

Individual staff workloads have increased due to either high-risk exposure or positive tests and resulting quarantine. These factors can cause significant stress among health care workers. However, the psychological impact of the pandemic on physically healthy healthcare workers has not been well studied. Many of the social factors that have already been demonstrated - long hospital stays, death of a relative, loss of job, months of forced isolation, lack of supplies, stigmatization - are likely to affect all of us, especially those who are more vulnerable to stress and already have mental health conditions [7]. Regarding the current pandemic, a hospital study in China, COVID-19 Infectious Diseases, surveyed 230 medical staff. According to the results, the incidence of anxiety reached 23.04% and the incidence of PTSD was estimated at 27.39%. All of this evidence becomes even more alarming when combined with the results of a study conducted in an Australian hospital in 2009. This study found that 53% of HCPs would arbitrarily absent themselves from work if a large number of influenza outbreak victims were admitted to their hospital. If this were to happen during a pandemic outbreak, the healthcare system would be severely compromised and could even collapse. COVID-19 seems to have delivered a double whammy. Previous researchers have pointed to PTSD as a secondary effect of the SARS-Cov-2 pandemic, both in the general population, patients, and healthcare workers [8-10].

Resilience, defined as the ability to respond to stress in a healthy way by achieving goals at minimal psychological and physical cost, plays a key role in reducing the impact of traumatic events and, therefore, in reducing PTSD and improving the quality of care. This statement is initially supported by the fact that, as described in previous

studies, a high percentage of healthcare professionals developed significant stress symptoms during the epidemic. Job role, marital status, age and gender, quarantine, stigma, previous psychiatric disorders, isolation, and survivors of the same outbreak also emerged as strong risk factors for PTSD. In parallel, the literature highlights a number of resilience factors, such as support, training, timely work organization, and good coping strategies. The majority of studies included in our review focused on the SARS outbreak of 2003, with less data available on MERS and studies on COVID-19 only beginning to emerge at the time of writing. All of these studies reported a high risk of adverse psychological outcomes, particularly PTSD among health care workers, suggesting that proximity to "ground zero" was an important risk factor. Finally, there is some evidence of a significant time effect in reducing PTSD symptom ratings, as observed in the SARS study by Su et al. [11], who reported a 50% reduction after one month, none of whom met criteria for PTSD. Resilient individuals tend to view adversity as an opportunity to gain new experiences and develop different decision-making processes [11,12].

2 Materials and Methods

The type of research used is analytical descriptive research with a comparative quantitative approach. Quantitative research is a research strategy that uses quantification in data collection and analysis with a deductive approach to the relationship between theories by placing theory testing. This research was conducted in April - May 2022 and successive sampling at multiple centres was carried out in six hospitals in Sulawesi of Indonesia. This study used the consecutive sampling technique. The study succeeded in obtaining data from 122 people who came from different professions of medical personnel. Then the research data with normal distribution were analyzed descriptively and tested for significance using independent t-test.

3 Results

According to Table 1, based on gender, females (52.5%) and males (47.5%) were found, while the average age was 30.8 years, with the predominant marital status being married (65.6%). All participants or 122 individuals were confirmed positive for COVID-19. The last confirmation was 4.7 months ago. On average, all were confirmed 1.38 times. Based on the level of COVID-19 symptoms experienced, mild symptoms (48.4%), no symptoms (33.6%), moderate symptoms (15.6%), severe symptoms (2.5%). The average number of days hospitalized is 5.98 days. Based on the problems experienced, personal health problems (45.1%) were the most common.

Table 1. Sociodemographic profile of the study sample

		N	%
Gender			
	Men	58	47,5%
	Women	64	52,5%
Age			
	21-25	9	7,38%
	26-30	36	29,5%
	31-35	67	55,8%
	36-40	10	8,19%
	(mean, SD)	30,8	±3,4
Marriage Status			
	Unmarried	39	32,0%
	Marry	80	65,6%
	Widow/Widower	3	2,5%
Education			
	Senior High School	6	4,9%
	Diploma 3	18	14,8%
	Strata 1	94	77,0%
	Strata 2	4	3,3%
Jobs			
	Doctor/Resident	54	44,3%
	Nurse	32	26,2%
	Midwife	8	6,6%
	Pharmacist/Pharmaceutical Personnel	7	5,7%
	Nutritionist	6	4,9%
	Physiotherapist	4	3,3%
	Biomedical Engineering Personnel	11	9,0%
History of Confirmed Positive COVID-19			
	Ever	122	100,0%
Last month distance Post COVID-19 to April 2022 (mean,SD)		4.76	±3,1
		Months	
Number of times confirmed Covid (mean, SD)		1.38 times	±0,7
Level of COVID-19 symptoms experienced			
	Asymptomatic	41	33,6%
	Mild Symptoms	59	48,4%
	Moderate Symptoms	19	15,6%
	Severe Symptoms	3	2,5%
Duration of hospitalization days (hospital and hotel)			
(mean, SD)		5.98 days	±7,7
Problems currently being experienced			
	Patient problem/medical error	20	16,4%

Interpersonal problems with fellow health workers	7	5,7%
Interpersonal problems with supervisors	1	0,8%
Family issues	6	4,9%
Relationship problems with partner	3	2,5%
Financial problems	30	24,6%
Personal health issues	55	45,1%

From Table 2 PCL-5 and PCFS results, it is found that in PCL-5 there are 18 people who experience PTSD (14.8%) out of 122 participants. As for the daily functional status after being infected with Covid 19, the dominant is no functional limitations of 56.6%, but as many as 8 participants (6.6%) experience severe limitations and 12 participants (9.8%) experience moderate limitation.

Table 2. PCL-5 and PCFS results

PTSD Checklist for DSM5 (PCL-5)	n	%
PTSD	18	14,8%
No PTSD	104	85,2%
Post COVID-19 Functional Status (PCFS)		
Grade 0 = No functional limitations	69	56,6%
Grade 1 = Negligible functional limitation	19	15,6%
Grade 2 = Mild functional limitation	14	11,5%
Grade 3 = Moderate functional limitation	12	9,8%
Grade 4 = Severe functional limitation	8	6,6%

Based on Table 3 regarding the relationship of variables to the incidence of PTSD based on PCL-5, the variables of age, marital status, level of COVID-19 symptoms experienced, duration of hospitalization, and problems experienced have a significant relationship. While the variables of gender, education, occupation, confirmed history, distance of the last month after COVID-19, the number of confirmed do not have a significant relationship.

Table 3. Relationship of variables to PTSD incidence based on PCL-5

Variables	PTSD n ; (%)	No PTSD	p Value
Gender			0,426
Men	7 ; (11.7%)	53 ; (88.3%)	

Women	11 ; (17.7%)	51 ; (82.2%)	
Age			p<0.001
21-25	3 ; (33.3%)	6 ; (66.7%)	
26-30	7 ; (19.4%)	29 ; (80.5%)	
31-35	3 ; (4.5%)	64 ; (95.5%)	
36-40	5 ; (50.0%)	5 ; (50.0%)	
(mean, SD)	31.1 ± 4.4	30.7 ± 3.2	
Marriage Status			0,015
Unmarried	13 ; (33.3%)	26 ; (66.7%)	
Marry	5 ; (5.2%)	75 ; (93.8%)	
Widow/Widower	0 ; (0%)	3 ; (100%)	
Education			0,098
Senior high school	0 ; (0%)	6 ; (100%)	
Diploma 3	0 ; (0%)	18 ; (100%)	
Strata 1	18 ; (13.9)	76 ; (80.9%)	
Strata 2	0 ; (0%)	4 ; (100%)	
Jobs			0,123
General Practitioner/Resident	13 ; (24.1%)	41 ; (75.9%)	
Nurse	2 ; (6.2%)	30 ; (93.8%)	
Midwife	0 ; (0%)	8 ; (100%)	
Pharmacist/Pharmaceutical Personnel	2 ; (28.6%)	5 ; (71.4%)	
Nutritionist	0 ; (0%)	6 ; (100%)	
Physiotherapist	0 ; (0%)	4 ; (100%)	
Biomedical Technical Personnel	1 ; (9.1%)	10 ; (90.9%)	
Last month distance Post COVID-19 to April 2022 (mean,SD)	6.6 Months ± 3.4	4.4 Months ± 3.0	0,069
Number confirmed COVID-19			0,653

(mean, SD)	1.4 Times ± 0.7	1.3 Times ± 0.7	
Level of COVID-19 symptoms experienced			p<0.001
Asymptomatic	7 ; (17.1%)	34 ; (82.9%)	
Mild Symptoms	6 ; 10.2%	53 ; (89.8%)	
Moderate Symptoms	2 ; (10.5%)	17 ; (89.5%)	
Severe Symptoms	3 ; (100%)	0 ; (0%)	
Duration of hospitalization days (hospital and hotel) (mean, SD)	12.3 days ± 8.2	4.8 days ± 7.0	p<0.001
Problems currently being experienced			0,047
Patient problems/medical errors	1 ; (5.0%)	19 ; (95.0%)	
Interpersonal problems with fellow health workers	1 ; (14.3%)	6 ; (85.7%)	
Interpersonal problems with supervisors	0 ; (0%)	1 ; (100%)	
Family issues	3 ; (50%)	3 ; (50%)	
Relationship problems with partner	1 ; (33.3%)	2 ; (66.7%)	
Financial problems	1 ; (3.3%)	29 ; (96.7%)	
Personal health issues	11 ; (20.0%)	44 ; (80.0%)	

Based on Table 4 about the relationship between PCL-5 and PCFS. The relationship between the incidence of PTSD and functional status in medical personnel post confirmed COVID-19 Psychological Trauma PTSD (as assessed by the PCL-5 scale) and daily functional status (as assessed by the PCFS scale) was found to be significant.

Table 4. Relationship between PCL-5 and PCFS

PCFS	PTSD n ; (%)	No PTSD	<i>p</i>
Grade 0 = No functional limitations	0 ; (0%)	69 ; (100%)	<i>p</i> <0.001
Grade 1 = Negligible functional limitation	2 ; (10.5%)	17 ; (89.4%)	
Grade 2 = Mild functional limitation	4 ; (28.6%)	10 ; (71.4%)	
Grade 3 = Moderate functional limitation	4 ; (33.3%)	8 ; (66.6%)	
Grade 4 = Severe functional limitation	8 ; (100%)	0 ; (0%)	

4 Discussion

Based on the demographics of this study, 11 women (17.2%) and 7 men (12.1%) experienced PTSD. Despite the fact that most studies confirm the preventive role of professional training in the onset of PTSD, to the point of eliminating the gender gap commonly observed in PTSD reports, most previous studies of healthcare workers dealing with the coronavirus outbreak tend to show a higher incidence of PTSD in women than in men. In fact, in three previous studies, women were found to be the most affected by PTSD [7]. In terms of age, the average age in this study was 31.1 years, which is consistent with previous studies of younger or less tenured health care workers. Work experience & three previous studies of the SARS outbreak and one study of the COVID-19 pandemic reported that younger health workers were at greater risk of developing PTSD. From a broader perspective, other studies show an association between fewer years of work experience and an increased risk of PTSD in healthcare workers, as described in two SARS studies [3]. Three previous studies have focused on the relevance of marital status, two of which related to the SARS outbreak and one to the current COVID-19 pandemic. Chan and Huak (2004) in a study of 661 healthcare workers in Singapore showed that those who were unmarried were more negatively affected than those who were married. This is consistent with the present study where the unmarried variable who experienced PTSD was (33.3%) [7]. Five studies, four on the SARS epidemic and one on the COVID-19 pandemic, highlighted the role of work as a major risk factor for PTSD in the coronavirus outbreak. A study of 96 emergency health workers assessed six months after the 2003 SARS outbreak found a greater burden of PTSD among nurses than among physicians. Finally, a recent study of 1,257 hospital physicians and nurses who treated COVID-19 patients concluded that physicians experienced more PTSD than other professions, which is also seen in this study where general practitioners/residents 13 people [7].

Based on the duration of hospitalization, there were 12.3 days who experienced PTSD, this can also be seen in previous research where three studies on SARS among Chinese hospital workers and one study on the MERS outbreak consistently reported high levels of PTSD among health workers who were quarantined longer due to exposure. More generally, during the SARS outbreak, social isolation and family separation were found to be associated with higher levels of PTSD, as was having an infected friend or close. As shown in Table 3, problems experienced, especially worries about family problems, have the highest reporting rate among several other problems in this study, at 50%. There was an increase in the incidence of PTSD in samples experiencing severe levels of PCFS, although the percentage with PTSD was greater in levels 1 to 3. However, grade 4, which has severe functional limitations, was found to be 100%. In the P value obtained $p < 0.0001$, which is said to be significant so that there is a relationship with the increase in PCL-5 with PCFS, where the existence of problems in the lives of health workers can affect the level of isolation and the degree of PTSD of a medical worker. Many well-documented social factors - illness, prolonged hospitalization, death of a loved one, loss of a job, forced quarantine for months at a time, lack of supplies, stigma - are likely to affect all of us, especially those who are more vulnerable to stress and already suffer from mental illness [3].

Individuals with PTSD are at increased risk for suicidal ideation and death by suicide, given that health care workers already have high-risk jobs. We call attention to PTSD as a secondary effect of the SARS-Cov-2 pandemic in healthcare workers. The burden of the current outbreak on health care providers deserves the greatest attention, as it is highly likely that health care workers involved in the diagnosis, treatment, and care of patients with COVID-19 are at risk for psychological and other mental health problems. This can be seen in this study, where there is an association between PTSD and functional symptom limitations experienced after COVID-19. Participants with PTSD will experience functional limitations, whether it is still negligible to mild and moderate [7]. The three main concerns that fellow psychiatrists should address are generating evidence with well-conducted studies, creating awareness and psychological preparedness among the general public and key service providers, and providing active psychological and psychiatric interventions to those in need.

5 Conclusion

There is a relationship between the incidence of PTSD and the functional status of medical personnel following confirmed COVID-19. Participants who experience PTSD are likely to experience functional limitations after COVID-19 or vice versa.

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