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THE RELATIONSHIP OF POST TRAUMATIC STRESS DISORDER FACTORS WITH PSYCHOSOMATIC SYMPTOMS TO LONG COVID PATIENTS AT RSUD TABANAN

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ABSTRACT

Long COVID is a disease in COVID-19 patients who have recovered, but still experience symptoms for longer than normal COVID-19 patients. The main contributing factor to the emergence of long-lasting symptoms is Post Traumatic Stress Disorder (PTSD). PTSD is a stress-related mental disorder and may arise following exposure to a serious and unpleasant traumatic event or injury. The World Health Organization (WHO) has recognized Long COVID as a significant health problem and has initiated research efforts. The aim of the research is to determine the relationship between Post Traumatic Stress Disorder factors and psychosomatic symptoms of Long COVID patients at RSUD Tabanan Regional.

This research is an observational analytic with a cross-sectional design. Sample collection was carried out on COVID-19 patients who had been declared cured and allowed to go home at the RSUD Tabanan who had met the inclusion and exclusion criteria. The sampling technique is purposive random sampling, with a minimum sample size calculated using the Lemeshow formula, namely 73 respondents. Data was collected using an offline questionnaire. This study aims to determine the age and gender characteristics, the magnitude of the incidence, and the relationship between Post Traumatic Stress Disorder factors and psychosomatic symptoms of Long COVID patients. The research results showed that a small number of respondents, 29 people (39.73%) experienced PTSD during COVID, and 44 people (60.27%) did not experience PTSD. The results of the analysis of the psychosomatic symptoms of Long COVID patients showed that the majority of respondents, 59 (80.82%) had long-lasting symptoms, and 14 (19.18%) patients did not have long-lasting symptoms. After being tested using the bivariate Spearman correlation test, the result was P value = 0.001 < α (0.050), meaning that there was a significant relationship between the Post Traumatic Stress Disorder factor and the psychosomatic symptoms of Long COVID patients at the RSUD Tabanan.

Keywords : Long COVID., Psychosomatic Symptoms., PTSD.

INTRODUCTION

The SARS-CoV-2 or COVID-19 pandemic has become a hot topic that is being discussed in all countries. Coronavirus Disease 2019 or COVID-19 is a disease caused by Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). This virus was first discovered in Wuhan, China on December 1, 2019 and had infected 88,382 people on March 2, 2020.[1]

Based on data from the World Health Organization (WHO), the spread of COVID-19 in all countries is still ongoing. It has been confirmed that the number of COVID-19 cases in the world has reached 114 million at the beginning of March 2021. The parameters possessed by the clinical manifestations of COVID-19 patients are very wide. It starts from no symptoms (asymptomatic), mild symptoms (fever and dry cough), slightly uncommon symptoms (loss of sense of smell and headache), to serious symptoms (shortness of breath and chest pain). Even for a long time, this condition can persist even though the patient has been declared cured. This is better known as the term "Long COVID".[2]

Long COVID or Post-COVID Syndrome is a condition in which the symptoms of COVID-19 can still be felt by corona virus patients who have been declared cured based on negative swab results. The World Health Organization (WHO) has effectively voiced the importance of paying attention to the Long COVID phenomenon in a number of recovered COVID-19 patients.[3] Since the announcement, many Long COVID survivors have shared their experiences both through social media, print media, and from patient groups through word of mouth about how the symptoms have remained felt all this time.[4]

At the Lancet conference, Chinese Academy of Medical Sciences on November 23, Bin Cao presented data on the consequences of Long COVID for patients in Wuhan, and warned that dysfunction and complications can persist in some patients even though they have been confirmed negative. Long COVID will certainly cause significant and ongoing morbidity.[5] This morbidity arises due to several factors, one of which is persistent systemic infection. This persistent infection is indicated by a pro-inflammatory response, which is a continuous increase in the production of cytokines and chemokines. This can stimulate an excessive antiviral immune response, leading to a negative feedback loop. Paradoxically, the most likely consequence is that the virus can persist. Superantigens will induce a strong immune response against any residual infection. According to the journal

Medical Hypotheses, persistent viral infection may be missed by routine RT-PCR diagnosis based on sampling from the nasopharyngeal and/or oropharyngeal cavity.[6]

In some cases, the physiological evaluation of patients with prolonged symptoms is not only done with a review of functional status, but must also be combined with mental well-being.[7] Most recovered COVID-19 patients have a chance of experiencing post-traumatic stress disorder, or more commonly known as Post-Traumatic Stress Disorder (PTSD). Post-traumatic stress disorder is a mental disorder or mental problem that arises due to the development of characteristic symptoms after being exposed to a traumatic event that causes significant or functional impairment. PTSD is estimated to have long-term consequences for both mental and physical health.[8] Stress occurs when there is too much pressure or demand on an individual, either physically or mentally, and they are unable to cope with it effectively. [9]

Therefore, it is important to know the age and gender characteristics, the magnitude of the incidence, and the relationship between Post Traumatic Stress Disorder factors and psychosomatic symptoms of Long COVID patients, as is the purpose of this study. Research on the relationship of Post Traumatic Stress Disorder factors to psychosomatic symptoms in COVID-19 patients needs to be conducted in order to provide knowledge and insights into one of the factors causing Long COVID in recovered or confirmed negative COVID-19 patients.

MATERIALS AND METHODS

The study was conducted using an observational analytic method with a cross-sectional design, where each respondent was only collected data once. The population in this study were COVID-19 patients who had been declared cured and allowed to go home at RSUD Tabanan from March to August 2022 who met the inclusion and exclusion criteria. Data were collected through a questionnaire and analyzed descriptively using SPSS 26 software and performed with Univariate Analysis and Bivariate Analysis.

The sampling technique was done by purposive random sampling, with the minimum sample size calculated using the Lemeshow formula, which is 73 respondents based on the exclusion and inclusion criteria. The research instruments to be used are a Post Traumatic Stress Disorder questionnaire from DSM-IV with the title Impact Event Scale-Revised (IES-R) and a questionnaire from the Health Journal study "Love That Renewed" with the title Long COVID Patient Characteristics Questionnaire. In the questionnaire, questions will be quoted that are tailored to the research objective to determine the relationship of Post Traumatic Stress Disorder factors to psychosomatic symptoms in COVID-19 patients. Data were collected using a questionnaire offline. The study has been approved by the Ethics Committee of the Faculty of Medicine, Udayana University with the letter number 395/UN14.2.2.VII.14/LT/2023.

RESULT

Based on the results of the questionnaire, 73 primary data were obtained.

Table 1. Distribution of data by age and gender group (n = 73)

Characteristic	Frequency	Percentage (%)
Age		
26-35 years	6	8.2
36-45 years	18	24.7
46-55 years	49	67.1
Total	73	100.0
Gender		
Female	36	49.32
Male	37	50.68
Total	73	100.0

Based on the age, the majority of respondents were in their early elderly years, or 46-55 years old, with 49 respondents (67.1%). When viewed from the gender category of the entire population, there were 37 respondents (50.68%) who were male, while the female category was 36 respondents (49.32%).

Table 2. Distribution of Post Traumatic Stress Disorder (PTSD) incidence data by age and gender (n=73)

Criteria	Age	Frequency (*f*)	Gender	Frequency (*f*)
Non-Post Traumatic Stress Disorder	26-35 years 36-45 years 46-55 years	4 (5.48%) 9 (12.32%) 17 (23.29%)	Female Male	10 (13.70%) 20 (27.40%)
Partial Post Traumatic Stress Disorder	26-35 years 36-45 years 46-55 years	1 (1.37%) 4 (5.48%) 9 (12.33%)	Female Male	9 (12.33%) 5 (6.85%)
Probable Post Traumatic Stress Disorder	26-35 years 36-45 years 46-55 years	1 (1.37%) 1 (1.37%) 4 (5.48%)	Female Male	3 (4.11%) 3 (4.11%)
Immunosuppression Post Traumatic Stress Disorder	26-35 years 36-45 years 46-55 years	0 (0%) 4 (5.48%) 19 (26.03%)	Female Male	14 (19.17%) 9 (12.33%)
	Total	**73 (100%)**	**Total**	**73 (100%)**

When viewed by age, COVID-19 patients at RSUD Tabanan who are more likely to experience Probable PTSD are patients aged 46-55, with 19 people (26.03%) and Immunosuppressive PTSD and 4 people (5.48%), so the total early elderly who are diagnosed with PTSD is 23 people (31.51%), considering PTSD Partial and Non PTSD are not included in the PTSD category.

Meanwhile, when viewed by gender, COVID-19 patients at RSUD Tabanan who are more likely to experience Immunosuppression PTSD are mostly female patients, with 14 people (19.17%) and 3 people (4.11%) experiencing Probable PTSD, so the total number of women diagnosed with PTSD is 17 people (23.28%).

Table 5.3 Distribution of Long COVID Incidence Data by Age and Gender (n=73)

Criteria	Age	Frequency (*f*)	Gender	Frequency (*f*)
Long COVID	26-35 years 36-45 years 46-55 years	5 (6.85%) 13 17.81%) 41 (56.16%)	Female Male	32 (43.83%) 27 (36.99%)
Non-Long COVID	26-35 years 36-45 years 46-55 years	1 (1.37%) 5 (6.85%) 8 (10.96%)	Female Male	4 (5.48%) 10 (13.70%)
	Total	**73 (100%)**	**Total**	**73 (100%)**

Based on Table 3, COVID-19 patients at RSUD Tabanan who are more likely to experience Long COVID are early elderly patients, with 41 people (56.16%). On the other hand, there are respondents who did not experience Long COVID, namely 14 people (19.18%) in all age categories.

When viewed by gender, COVID-19 patients at RSUD Tabanan who are more likely to experience Long COVID tend to be female, with 32 people (43.83%), while male, namely 5 people (6.85%).

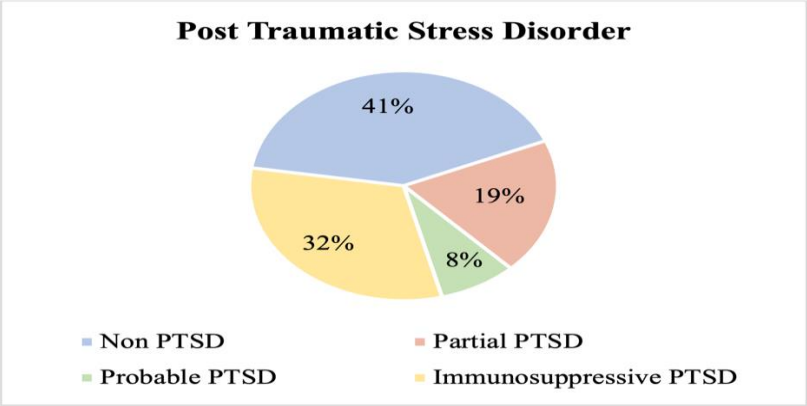

Figure 1. Percentage of PTSD categories of COVID-19 patients at RSUD Tabanan

Figure 1 shows that the majority of respondents, 41.09% or 30 people, do not experience Post Traumatic Stress Disorder (PTSD). 14 people (19.18%) of the respondents experience Partial PTSD, which only consists of some PTSD symptoms. In addition, 23 people (31.51%) experience Immunosuppressive PTSD, which can suppress the immune system. Respondents who experience Probable PTSD, or the standard diagnostic threshold for PTSD, are only 8.22% or 6 people out of a total of 73 respondents studied.

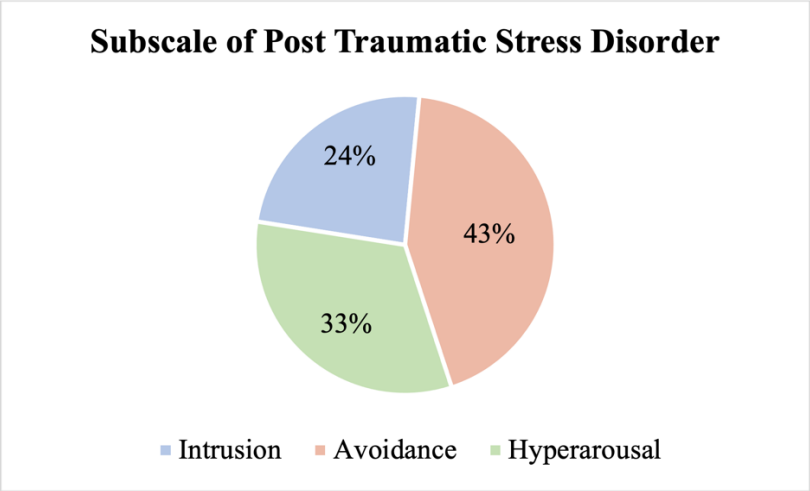

Figure 2. Percentage of PTSD subscales of COVID-19 patients at RSUD Tabanan

Figure 2 shows that the majority of respondents who are COVID-19 patients at RSUD Tabanan experience Post Traumatic Stress Disorder (PTSD) with avoidance symptoms with a total average score of 117.38 (43.46%), experiencing intrusion symptoms with a total average score of 64.88 or 24.02%, and those who experience hyperarousal symptoms are 32.52% or with a score of 87.83 from a total of 73 respondents studied.

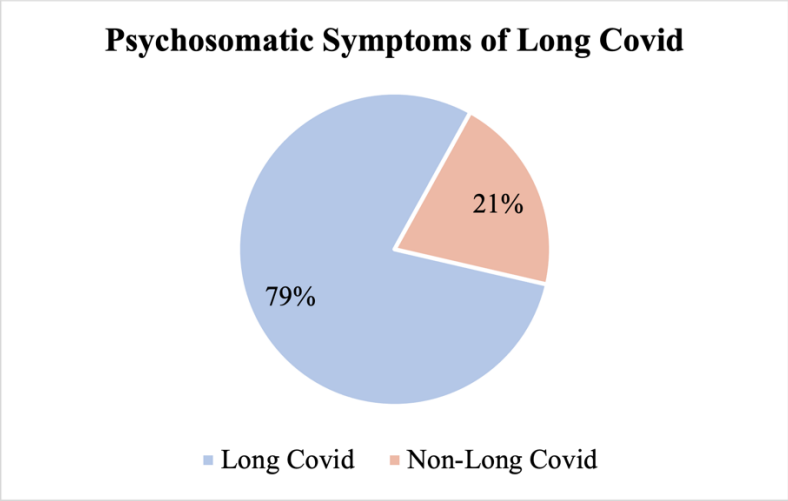

Figure 3. Percentage of COVID-19 Patients with Long COVID Symptoms at RSUD Tabanan

Figure 3 shows that the majority of respondents who experienced Long COVID and had several Long COVID psychosomatic symptoms that lasted for a long time, namely as many as 58 people (79.45%). The remaining 15 people or 20.55% of patients did not experience Long COVID.

From the results of the frequency distribution of Long COVID psychosomatic symptoms, it was found that the majority of COVID-19 patients at RSUD Tabanan experienced five main symptoms, namely fatigue as many as 56 people (76.71%) or 25%, shortness of breath as many as 46 people (63.01%), headache as many as 46 people (63.01%), cough as many as 41 people (56.16%), and joint pain as many as 39 people (53.42%).

Table 4. Results of Bivariate Spearman Correlation Analysis (n=73)

PTSD	Long Covid		Total	P Value	Correlation Coefficient
	Yes	No			
Non-PTSD	18 (24.66%)	12 (16.44%)	30 (41.10%)	0.001	0.449
Partial PTSD	12 (16.44%)	2 (2.74%)	14 (19.18%)		
Probable PTSD	6 (8.22%)	0 (0%)	6 (8.22%)		
Immunosuppressive PTSD	23 (31.51%)	0 (0%)	23 (31.51%)		
Total	**59 (80.82%)**	**14 (19.18%)**	**73 (100%)**		

Based on Table 4, the correlation coefficient between the PTSD and Long COVID Psychosomatic Symptoms is 0.449. This correlation coefficient indicates that there is a positive and moderate relationship between the two variables. Based on the results of the correlation test, it can be concluded that there is a positive relationship between PTSD and Long COVID Psychosomatic Symptoms. This means that the higher the patient experiences PTSD, the higher the incidence of Long COVID, along with its psychosomatic symptoms. The data in this table also shows that there are 6 patients who experience Probable PTSD and 23 patients who experience Immunosuppressive PTSD, all of which are associated with Long COVID.

DISCUSSION

In the results of the frequency distribution study, 39.72% of 73 respondents experienced Post Traumatic Stress Disorder (PTSD), with 31.50% suffering from Immunosuppressive PTSD and 8.22% Probable PTSD. These findings are consistent with

Irwin's research, showing that COVID-19 patients who are hospitalized are more likely to experience severe symptoms, increasing the risk of PTSD. Conversely, 19.18% experienced Partial PTSD, and 41.10% did not experience PTSD, consistent with the finding that patients without PTSD have milder symptoms. The psychological impact of the COVID-19 pandemic, such as the loss of loved ones, job loss, and isolation at home, has contributed to mental health disorders in the community. Many individuals experience trauma related to these events, triggering the possibility of Post Traumatic Stress Disorder (PTSD). PTSD can be triggered by exposure to a traumatic event, and COVID-19 patients are likely to experience symptoms such as flashbacks, nightmares, increased arousal, and difficulty concentrating. Factors such as a lack of coping skills and repeated exposure to trauma can worsen patients' psychological condition, making PTSD a serious impact of the pandemic.[10]

The results of a study at RSUD Tabanan showed that patients with Post Traumatic Stress Disorder (PTSD) had the main symptom of avoidance, which is not in line with the findings of Putri et al. who showed that intrusive symptoms such as flashbacks and nightmares were more common, at 30.3% of respondents.[11] This difference may be due to the different number of respondents between the two studies. The study by Jiang et al. with 1000 respondents highlighted intrusive symptoms as the main symptom, in contrast to the findings of this study which only used 73 respondents as a minimum sample.[12] On the other hand, the results of this study are in line with the research by Kurnia, which also states that avoidance symptoms are most common in COVID-19 patients, although using a different assessment method, namely PCL-5. Factors such as fear of re-infection with COVID-19, traumatic experiences during treatment, and self-isolation can cause patients to avoid thoughts, feelings, or situations that remind them of the traumatic event. Even after recovery, patients may still avoid high-risk activities of infection. Although avoidance is a common defense mechanism for coping with trauma, a deep understanding of PTSD symptoms and triggers is important for effective management and care.[13]

In this study, 80.82% of 73 respondents experienced psychosomatic symptoms of Long COVID, in line with the CDC theory that suggests a high likelihood of Long COVID in patients. Factors such as gender, underlying conditions, age, ethnicity, smoking, comorbidities, and immune dysfunction can increase the risk of Long COVID. Immune dysfunction, which can be triggered by chronic stress or PTSD, has also been identified as a potential factor. The five most common Long COVID symptoms experienced by respondents included fatigue (76.71%), shortness of breath (63.01%), headache (63.01%), cough (56.16%), and joint pain (53.42%).

This study found that 56 people with Long COVID experienced fatigue, which was influenced by changes in body function after exposure to COVID-19. These changes involved metabolism, the immune system, and the nervous system. Fatigue can be caused by both psychological and peripheral factors, such as nerve inflammation, neurotransmitter dysfunction, and musculoskeletal problems, which can lead to long-term fatigue. These findings are consistent with research by Putra et al., which highlighted an excessive inflammatory response and disruption of the central nervous system's glial lymphatic system, providing further understanding of the fatigue symptoms in Long COVID patients.[14]

Psychosomatic symptoms of Long COVID include shortness of breath (63.01%), which can be influenced by lung damage, inflammation, and fibrosis. Lung fibrosis can make the lungs stiff and less elastic, causing difficulty breathing, especially in patients with emotional stress and anxiety related to PTSD. Physical reactions such as rapid breathing and racing heart can worsen shortness of breath.[15]

In addition, the study showed that 46 respondents (63.01%) experienced long-term headache after COVID-19. The study by Suparti et al. supports these findings by showing that psychological stress, the effects of the virus on the nervous system, dehydration, and hypoxia can cause persistent headaches after recovery. The stress response to these conditions can cause muscle tension and changes in blood flow, which become triggers for persistent headaches.[16]

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The study found a positive correlation coefficient (0.449) between Post Traumatic Stress Disorder (PTSD) and Psychosomatic Symptoms of Long COVID. This result is consistent with the study by Mandal et al. which showed a 3.5 times higher risk of Long COVID in patients with PTSD. In this study, 39.73% of respondents had PTSD and 79.45% had Long COVID, confirming their association. Long-term stress, as a consequence of PTSD, can weaken the immune system, increase the risk of infection, and worsen COVID-19 symptoms.[17]

Other studies have found that COVID-19 patients with PTSD have a higher risk of Long COVID and additional symptoms such as fatigue, shortness of breath, and muscle pain. PTSD affects biological and psychological factors that worsen inflammation and tissue damage, prolonging COVID-19 symptoms.[17] The bidirectional relationship between Long COVID and PTSD creates a negative spiral, in which traumatic experiences can trigger PTSD, while chronic stress can increase the risk of Long COVID.[18] A recent study by Mandal et al. highlighted the physiological and behavioral changes caused by PTSD, worsening Long COVID symptoms, with PTSD treatment recommended to reduce Long COVID symptoms.[18]

The study by Ritchey et al. highlighted that increased stress hormones in individuals with PTSD can contribute to Long COVID symptoms such as fatigue, shortness of breath, and muscle pain.[21] Increased sympathetic nervous system activity in people with PTSD can worsen Long COVID symptoms. Long-term stress, weakening the immune system, increases the risk of Long COVID, which is characterized by prolonged symptoms, including fatigue, shortness of breath, and muscle pain.[17]

PTSD triggers the release of TH-1 cytokines, which activate the inflammatory response of the immune system. Through adrenergic agonists, the cellular immune response changes from anti-inflammatory TH-1 to TH-2. Immunosuppressive factors in the inflammatory cellular immune system, such as decreased cortisol receptor regulation, can increase the risk of Long COVID. Patients with immunosuppression are more susceptible to viral infection, triggering Cytokine Storm in COVID-19, causing Long COVID symptoms.[22]

Although these factors can increase the risk of Long COVID in individuals with PTSD or high stress, it is important to note that the main cause of Long COVID remains the SARS-CoV-2 virus. In the face of these risks, the role of healthcare providers is essential. Physical and mental health support, COVID-19 prevention measures, and stress and PTSD management can help reduce the risk and impact of Long COVID in vulnerable individuals.

CONCLUSION AND RECOMMENDATION

The incidence of Post Traumatic Stress Disorder (PTSD) and Psychosomatic Symptoms of Long COVID was experienced by 29 people (39.73%), with the majority being early elderly or 46-55 years old, at 23 people (31.51%), and experienced mostly by women, at 17 people (23.29%).

PTSD has a significant relationship with Psychosomatic Symptoms of Long COVID. There is a positive and moderate relationship between the two variables. This means that the higher the patient experiences PTSD, the higher the incidence of Long COVID, along with its psychosomatic symptoms.

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