



## Original Article

# Influence of depression, stress, and anxiety on work performance among nurses in tuberculosis/HIV and COVID-19 units on Timor Island

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### Abstract

**Objectives:** The aim of this study was to assess the relationship between work performance and self-reported symptoms of depression, stress, and anxiety among nurses in tuberculosis (TB)/HIV and COVID-19 units on Timor Island, Indonesia.

**Methods:** This research used a comparative, cross-sectional design. The data were collected between October 2020 and January 2021. The total population sampling technique was used. The study group comprised 236 nurses working in TB/HIV isolation rooms and 423 nurses in COVID-19 isolation rooms. The data were collected using the Depression, Anxiety, and Stress scale (DASS-42) and a work performance questionnaire. The instruments were administered online. The collected data were analyzed using independent t-testing to see differences in the performance of TB/HIV isolation unit nurses compared with that of COVID-19 isolation unit nurses, and the Pearson correlation coefficient (*r*) was used to measure the strength and direction of the relationship between work performance and depression, stress, and anxiety.

**Results:** The mean DASS-42 scores of nurses in the TB/HIV isolation units were low, indicating minimal effects. The mean score was 4.56 for depression, 4.44 for anxiety, and 5.63 for stress. The scores of those in the COVID-19 isolation units reflected moderate levels of depression, stress, and anxiety: the mean was 17.03 for depression, 11.23 for anxiety and 6.120 for stress. The work performance results indicated that the nurses in the TB/HIV isolation rooms, on average, had sufficient work performance, while those in the COVID-19 isolation rooms demonstrated weaker work performance. There was a significant difference in the work performance between nurses working in the 2 units (*p* value <0.05).

**Conclusion:** The state of nurses' depression, stress, and anxiety was correlated with work performance in the TB/HIV and COVID-19 isolation units.

**Keywords:** Anxiety; COVID-19; depression; HIV infection; stress; tuberculosis; work performance.

Infectious and potentially deadly diseases, such as tuberculosis (TB), HIV/AIDS, and the new coronavirus 2019 (COVID-19) are a global concern. TB and HIV/AIDS have long been leading causes of mortality as a result of infection.<sup>[1]</sup> Though it is curable, TB accounts for millions of deaths every year.<sup>[2]</sup> TB is a particular risk for those living with HIV/AIDS. In 2018, there were an estimated 10 million new TB cases globally, and 8.6% were HIV/AIDS patients.<sup>[2]</sup> In countries that have a high HIV/

AIDS prevalence, the percentage of TB patients who have HIV/AIDS can be much higher.

HIV/AIDS is one of the most intensely studied infectious diseases in history. There were 50,282 reported cases of HIV and 7,036 cases of TB reported in Indonesia in 2019. In East Nusa Tenggara province, 821 new HIV cases and 29 new TB cases and 209 new cases of COVID-19 were reported.<sup>[3]</sup>

The outbreak of severe acute respiratory syndrome coronavi-

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**What is presently known on this subject?**

• Timor Island is one of many islands in the East Nusa Tenggara province of Indonesia. Some referral hospitals combine tuberculosis and HIV/AIDS patients in a single isolation room. Coronavirus 2019 (COVID-19), tuberculosis (TB), and HIV are infectious diseases that require isolation. Nurses in isolation rooms must have optimal work performance. However, a nurse's work performance can be significantly influenced by the conditions and their mental condition.

**What does this article add to the existing knowledge?**

• Nurses in the COVID-19 and TB/HIV isolation units demonstrated different levels of work performance. The nurses in the COVID-19 rooms reported signs of greater psychological distress related to the risks of infection and living in isolation and weaker work performance.

**What are the implications for practice?**

• Nurses in the COVID-19 isolation units had higher rates of depression, stress and anxiety than those working in TB/HIV isolation units. The unique conditions associated with COVID-19 recommend that health professionals involved in care for these patients need special attention and emotional support to preserve their work performance and care for their mental health.

rus-2 (SARS-CoV-2) in Wuhan, China in late 2019, the virus that causes COVID-19, spread rapidly around the world.<sup>[4]</sup> The effects of the pandemic have been significant. The rapid transmission of a new and potentially deadly virus had broad and significant consequences, including economic and social disruption.<sup>[4]</sup> Pandemics have a profound effect on often already-stretched healthcare systems, and particularly on the workforce.<sup>[5]</sup>

Nursing includes the promotion of health, prevention of illness, and the care of those who are ill. Nurses are the single largest group of health professionals.<sup>[6]</sup> They play an important role during disasters and emergencies, including outbreaks of disease.<sup>[7]</sup> As frontline health workers, they must be knowledgeable of and appropriately skilled to implement and manage complex workplace protocols.<sup>[8,9]</sup> Despite professional commitment, burnout is common, and extreme conditions can have additional psychosocial effects and impact work performance. Complex and demanding circumstances can lead to signs of psychological distress.<sup>[6]</sup>

Nurses provide close care for patients with infectious diseases, such as TB, HIV/AIDS, and COVID-19, and consequently, they are exposed to infection. This presents significant challenges, as the necessary close involvement in patient care often occurs in an environment characterized by insufficient human and material resources.<sup>[10]</sup>

Psychosocial consequences of the particular environment involved in caring for those with an infectious disease are common. The COVID-19 pandemic led to extraordinary circumstances. Nurses experienced stress associated with required separation from family and familiar routines, lack of sleep, and a very heavy workload.<sup>[11]</sup> A lack of resource preparedness can have a negative psychological impact during a crisis.<sup>[5,12]</sup> During the initial COVID-19 outbreak, nurses often had to cope with a lack of appropriate protective equipment, in addition to extra work and other challenging conditions.<sup>[13]</sup>

The emergence of a novel virus with rapid transmission, uncertain treatment, and infection and death among health workers created a particularly stressful environment. Coupled

with the fear that they might become infected or infect their loved ones, stigma as a result of contact with those infected, and the effects of living in isolation led to increased anxiety and fear among nurses. Those caring for infected patients also showed greater signs of obsessive and depressive disorders.<sup>[14]</sup> These psychological symptoms can affect work performance. Those who work in health professions are generally compassionate and generous, and during the worst of the COVID-19 pandemic, nurses and other professionals demonstrated extraordinary commitment; however, the conditions can have a significant effect.

Nurses in 2 hospitals who participated in this study reported that when caring for COVID-19 patients in an isolation room, they experienced feelings of anxiety and stress due to the lack of personal protective equipment (PPE), the transmissibility of the disease, and uncertain treatment protocols. COVID-19 patients, like those with other infectious diseases, are isolated in special rooms. Nurses provide direct care to patients in these rooms in close physical proximity and, therefore, are often exposed to the virus and are at high risk of developing the disease.<sup>[5,11]</sup>

The Indonesian province of East Nusa Tenggara consists of many islands, including Timor Island. Some referral hospitals on Timor Island use a combined isolation room for TB and HIV/AIDS patients. The need for standard operating procedures that differ from other hospital units makes this practical; however, the conditions may contribute to a difficult burden for the staff to manage.

Nurses who care for patients with infectious diseases may experience additional stress, depression, and anxiety. The objective of the present study was to assess any relationship between work performance and self-reported symptoms of depression, stress, and anxiety among nurses working on Timor Island in TB/HIV and COVID-19 units.

## Materials and Method

### Ethical Considerations

Approval for this study was granted by the Singaraja Community Welfare Foundation– Commission for Health Research Ethics, Buleleng Institute of Health Sciences on October 2, 2020 (no: 120/EC-KEPK-SB/X/2020). The research was conducted in compliance with ethical guidelines and included no form of treatment to the research subjects. The respondents were provided with information regarding the purpose, methods, and procedures of the study and provided written, informed consent.

### Study Design

This was a comparative, cross-sectional study.<sup>[16]</sup> The research was designed to assess the relationship between work performance and self-reported symptoms of depression, stress, and anxiety among nurses in TB/HIV and COVID-19 units at referral hospitals on Timor Island, Indonesia.

The data were collected between October 2020 and January 2021. The total sampling technique was used. The study population was all of the nurses working in TB/HIV and COVID-19 isolation rooms. The final study group consisted of 236 nurses from TB/HIV units and 423 nurses from COVID-19 units. The respondents were aged 27-45 years and had a minimum education level that ranged from a 3-year nursing diploma to a bachelor's degree in nursing.

**Measurement Tools**

Two scales were used for data collection: the Depression, Anxiety, Stress (DASS-42) questionnaire<sup>[17]</sup> and a nurse work performance questionnaire.<sup>[16]</sup> Both instruments are available for Indonesian populations.

The DASS-42 is a well-known self-report scale designed to measure the negative emotional states of depression, stress, and anxiety. The reliability and validity of the DASS-42 has been internationally tested.<sup>[18]</sup> An Indonesian version of this instrument is available in many open access journals. The results of a reliability test yielded a Cronbach alpha of 0.94 for depression, 0.88 for anxiety, and 0.93 for stress. The scale comprises a total of 42 questions, with 14 questions for each of the 3 factors of depression, stress, and anxiety. The depression scale measures symptoms typically associated with dysphoric mood (sadness or feelings of worthlessness); the anxiety scale is primarily related to symptoms of physical arousal, panic attacks, and fear; and the stress scale measures symptoms such as tension, irritability, and a tendency to overreact to stressful events. The questionnaire uses a Likert-type scale of 0-3 (never, sometimes, often, almost always). The total score can range from 0 to 56; a higher score indicates greater levels of depression, stress, and anxiety. The results observed in this study were presented using the mean, minimum-maximum and SD.

The work performance questionnaire used was taken from the book, "Konsep dan Penerapan Metodologi Penelitian Ilmu Keperawatan" (Concepts and Application of Nursing Research Methodologies). This questionnaire is specifically designed to assess the performance of nurses.<sup>[16]</sup> Validity and reliability testing produced an r value of <0.678 and a Cronbach alpha value of 0.863. The questionnaire measures job performance of duties and responsibilities related to obtaining informed consent, patient assessment, diagnosis, action planning, and the implementation and evaluation of nursing activities.<sup>[19]</sup> The scale consists of 15 statements scored 1-3 (always performed, sometimes performed, not performed). The total possible score is 15-45, and a higher score indicates weaker performance. The results were presented using the mean, minimum-maximum and SD.

**Research Process**

The study was announced and shared via a nurses' WhatsApp messaging group (Meta Platforms Inc./Facebook Inc., Menlo Park, CA, USA) and administered online using Google Forms

**Table 1. Mean depression, stress, anxiety scores and work performance results of nurses in TB/HIV and COVID-19 isolation units**

Variables	Depression				Anxiety				Stress				Work performance							
	Mean	MD	Min-Max	t	p value	Mean	MD	Min-Max	t	p value	Mean	MD	Min-Max	t	p value					
TB/HIV isolation units	4.56	4.966	0-19	0.278	0.001	4.44	4.457	0-16	-0.85	0.001	5.63	5.548	0-18	-12.23	0.001	26.69	1.302	15-36	0.484	0.001
COVID-19 isolation units	17.03	3.064	9-21			11.23	3.733	10-18			24.54	6.120	12-36			40.54	5.038	33-45		

COVID-19: Coronavirus 2019; MD: Mean difference; TB: Tuberculosis.

**Table 2. Correlation between depression, stress, anxiety and work performance among nurses in TB/HIV and COVID-19 isolation units**

Variable	Variables			
	Work performance	Depression	Stress	Anxiety
			p-value	
TB/HIV isolation units		0.856	0.696	0.342
COVID-19 isolation units		0.018	0.018	0.017

COVID-19: Coronavirus 2019; TB: Tuberculosis.

**Table 3. Difference in the work performance of nurses in TB/HIV and COVID-19 isolation units**

Variables	Mean	MD	95% CI		p-value
			Lower	Upper	
TB/HIV isolation units	26.69	1.302	0.541	5.757	0.019
COVID-19 isolation units	40.54	5.036			

COVID-19: Coronavirus 2019; MD: Mean difference; TB: Tuberculosis; CI: Confidence interval.

(Google LLC, Mountain View, CA, USA). The data were collected during the 4-month period (October 2020-January 2021).

**Statistical Analysis**

The collected data were analyzed using IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA). Pearson’s correlation test was employed to determine the correlation between work performance and depression, stress, and anxiety. An independent t-test was used to examine differences in the work performance between nurses working in TB/HIV isolation rooms and those working in COVID-19 isolation rooms. A parametric t-test was used based on the normal distribution of the data.

**Results**

**Mean Psychological Impact and Work Performance Measurements**

Table 1 shows that the mean DASS-42 scores suggest that the respondents working in the TB/HIV isolation room experienced mild depression, anxiety, and stress, and demonstrated sufficient work performance. The results showed that the respondents working in the COVID-19 isolation room experienced moderate depression, anxiety, and stress and poorer work performance.

**Correlation Between Depression, Stress, Anxiety, and Work Performance**

The results presented in Table 2 indicate that the psychological impacts on nurses working in the TB/HIV isolation room

were not associated with work performance. The scores of the nurses in COVID-19 isolation room showed a correlation between the psychological impacts and their work performance.

**Difference in Work Performance**

Table 3 illustrates a significant difference in the work performance between nurses working in the TB/HIV isolation units and those in COVID-19 isolation units (p=0.019).

**Discussion**

This study was designed to determine correlations between work performance and symptoms of depression, stress, and anxiety among nurses working in TB/HIV and COVID-19 isolation units, and to compare the work performance of nurses in these 2 units that require isolation measures.

COVID-19 is a highly infectious disease that emerged as the result of the outbreak of a new virus. There was a sudden need to implement new standards and procedures under significant duress as a result of a lack of resources and information about a novel virus. Nurses working in COVID-19 isolation rooms have reported complaints ranging from insufficient supplies of PPE and discomfort due to long use, fear of infection, and a variety of other hardships and stresses. The results of this study are consistent with previous research that has noted that nurses displayed a high level of depression, stress, and anxiety during the COVID-19 pandemic.<sup>[20]</sup>

The depression reported was related to the high rate of infection among fellow nurses who cared for COVID-19 patients. Anxiety was associated with family circumstances or lack of emotional support due to mandatory isolation. Stress was re-

lated to the use of the PPE that caused discomfort when used for a long period of time. The results of this study are similar to those observed by Tomlin et al.,<sup>[21]</sup> who reported that most nurses experienced depression, anxiety, and stress due to difficulties associated with their ability to carry out their duties as health providers. One of the factors that greatly influenced nurses' work performance was the availability of PPE.<sup>[22]</sup>

The nurses in this study also said that they felt a lack of enthusiasm or boredom because their activities were very limited and restrictions imposed to contain the spread of infection were difficult. Nurses were required to work in the hospital for 14 days and then isolate themselves for the next 14 days. Ying et al.<sup>[23]</sup> also found that one of the factors that affected the work performance of nurses was support from close family; limited contact reduced the motivation and support ordinarily available when they were tired or anxious.

Nurses working in TB/HIV isolation rooms can provide emotional support to their patients and educate patients and families, but all activity in COVID-19 isolation rooms is more restricted and visits from family members and others are prohibited. Nurses working in COVID-19 isolation rooms said that they were very limited in their ability to provide emotional support to patients. Compassion is a fundamental element of nursing and comprehensive care is a source of professional fulfillment. Limitations to the ability to relieve suffering and a more depersonalized environment can contribute to dissatisfaction, burnout, and poor performance.

Nurses working in the TB/HIV isolation units were already familiar with their work routines and environment. The risk factors for infection were well understood and managed in the course of their activities. Established practices likely contributed to good work performance and fewer psychological effects. In contrast, the sudden emergence and spread of COVID-19 required a rapid response with incomplete information or resources.

Challenging conditions, including isolation, as well as external factors, such as public lack of compliance with protocols to prevent the spread of COVID-19, can contribute to depression, stress, and anxiety and influence work performance.

### Limitations

The limited sample size prevented control for confounding variables that could affect psychological conditions and work performance. Future studies that investigate factors such as external support from family or a partner, as well as hospital management practices will be valuable.

### Conclusion

Depression, stress, and anxiety levels were correlated with the work performance of nurses in COVID-19 isolation units. Limited interaction with patients and restricted social life were influential factors. The ability to offer comprehensive care pa-

tients that included biological, psychological, social, spiritual, and cultural aspects was severely limited and had an impact on the nurses in that unit.

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