



Relationship between Anxiety Level and Vital Signs of Pneumonia Patients in Hospital

Daviq Ayatulloh¹, Diah Priyantini², Abdullah Fuad¹, Putri Ohktafiani¹, Mariyatul Kiptiyah²,
Gangga Kristin Nurfiyatul Jannah²

¹ Faculty of Health Science, Universitas Gresik, Indonesia

² Faculty of Health Science, Universitas Muhammadiyah Surabaya

INFORMATION

Corresponding authors:
ayatulloh.daviq.22@gmail.com

Keywords:

Anxiety level, vital sign,
Pneumonia

ABSTRACT

Pneumonia is one of the acute respiratory tract infections that is still a serious and complex global health problem, with a very significant impact on public health worldwide. The purpose of this study was to analyze the relationship between anxiety levels and vital signs in hospitalized pneumonia patients. This study used an observational analytical research design with a cross-sectional approach with 64 respondents were recruited using convenience sampling techniques. The independent variable of the study was anxiety level and the dependent variable was vital signs (blood pressure, pulse, respiration, and temperature). The research instrument used was the Hamilton Anxiety Rating Scale (HARS) Questionnaire to measure anxiety levels and the dependent variable was measured using the Vital Signs Observation Sheet, Digital Tensimeter and Digital Thermometer. Data Analysis Data were analyzed using the Spearman or Pearson correlation test (according to data normality) with a confidence level of 95% ($\alpha = 0.05$). Vital signs of pneumonia patients showed that 28.13% of patients were not anxious and had normal blood pressure, 25.00% of patients had normal respiration rate, 21.88% showed normal pulse rate and 23.44% showed normal oxygen saturation. High anxiety levels showed that 25.00% of patients had abnormal blood pressure, 25.00% of patients had abnormal respiration rate, 28.13% showed abnormal pulse rate and 23.44% of patients had abnormal oxygen saturation. The results of the study showed that anxiety had a significant relationship with blood pressure, pulse rate, respiration rate, and oxygen saturation with a p value <0.05 .

INTRODUCTION

Pneumonia is one of the acute respiratory tract infections that is still a serious and complex global health problem, with a very significant impact on public health worldwide (Liu et al., 2022). This condition is characterized by very high morbidity and mortality rates in various countries, especially in developing countries and areas with limited access to adequate health services. This infection specifically attacks lung tissue in an aggressive manner and can develop very quickly, causing various life-threatening complications if not immediately identified and treated appropriately by competent medical personnel (Bryan, Zipp and Breitzkreuz, 2021; Najafi et al., 2022). As a serious and potentially life-threatening medical condition, pneumonia often causes significant anxiety in patients who experience it, a psychological response that is natural but needs special attention, because in turn it can affect and change their vital signs significantly, which can have an impact on the patient's prognosis and recovery (Abu Khait and Lazenby, 2021; Joshi et al., 2021).

The anxiety experienced by pneumonia patients can arise from various complex and interrelated factors, such as difficulty breathing that interferes with daily activities, persistent chest pain that causes discomfort, and deep concerns about their current and future health conditions (Reisi et al., 2021; Ozdemir et al., 2022). This manifestation of anxiety is often exacerbated by uncertainty about the prognosis of the disease and the length of recovery time required. The varying levels of anxiety in each patient, ranging from mild to severe anxiety, have the potential to have a significant impact on the body's physiological parameters reflected in vital signs, where the resulting stress response can affect the function of the cardiovascular system, respiration, and body temperature regulation (Pouyanfard et al., 2020; Liu et al., 2022). Based on data from the World Health Organization (WHO), pneumonia remains the leading cause of death in children and adults worldwide, with an estimated 2.5 million deaths each year. In developing countries, the incidence of pneumonia reaches 20% of all deaths in children under the age of five. Meanwhile, in Indonesia, according to data from the Indonesian Ministry of Health, the prevalence of pneumonia reaches 4.5% of the total population, with a significant mortality rate especially in vulnerable age groups (Hoge et al., 2020; Goldin et al., 2021).

In the context of an emergency, around 30-40% of pneumonia patients require intensive care due to

serious complications such as sepsis and respiratory failure. Recent studies have shown that more than 60% of hospitalized pneumonia patients experience moderate to severe levels of anxiety (Miranda et al., 2020; Oberoi et al., 2020). This anxiety not only affects the patient's quality of life but is also correlated with increased length of hospitalization and complexity of care. Multicenter studies conducted in various hospitals showed that pneumonia patients with high levels of anxiety have a 1.5 times greater risk of complications compared to patients with low levels of anxiety (Li et al., 2020; Hasina et al., 2021). Vital signs, which are a series of physiological parameters that include blood pressure (both systolic and diastolic), pulse rate (which reflects heart activity), respiratory rate (which indicates respiratory system function), and body temperature (as an indicator of inflammatory response), are very important and fundamental clinical indicators in assessing the health status of pneumonia patients comprehensively and continuously (Burgstahler and Stenson, 2020; Dehghan, Namjoo, Zarei, et al., 2021). Changes in these vital signs can be significantly influenced by psychological and physiological stress responses that arise due to anxiety experienced by patients, where every slightest change in these parameters can provide valuable information about the patient's clinical condition and the body's response to the disease and the interventions given (Dehghan, Namjoo, Mohammadi Akbarabadi, et al., 2021; Banda et al., 2022).

A deep and comprehensive understanding of the relationship between anxiety levels and changes in vital signs in pneumonia patients is a very crucial and fundamental aspect in providing holistic care that is oriented towards the patient's needs as a whole. This knowledge not only allows healthcare professionals to identify and anticipate potential physiological changes, but also provides a solid foundation for the development of more effective intervention strategies (Sutriana, Sitaresmi and Wahab, 2021; Solomon et al., 2022). This in turn can help healthcare professionals design and implement targeted, evidence-based interventions to optimally manage patient anxiety levels, while monitoring and stabilizing their vital signs more effectively and sustainably. The purpose of this study was to analyze the relationship between anxiety levels and vital signs in hospitalized pneumonia patients.

METHODS

This study used an observational analytical research design with a cross-sectional approach to analyze the relationship between anxiety levels and

vital signs in pneumonia patients. The population in this study were all pneumonia patients treated at the Hospital during the study period. Sampling used consecutive sampling techniques with predetermined inclusion and exclusion criteria. The inclusion criteria for respondents were patients diagnosed with pneumonia, aged ≥ 18 years and willing to be research respondents. The exclusion criteria for the study showed patients with impaired consciousness, patients with other serious complications, patients who refused to participate in the study. The sample size of the study showed that 64 respondents were recruited using convenience sampling techniques. The independent variable of the study was anxiety level and the dependent variable was vital signs (blood pressure, pulse, respiration, and temperature). The research instrument used was the Hamilton Anxiety Rating Scale (HARS) Questionnaire to measure anxiety levels and the dependent variable was measured using the Vital Signs Observation Sheet, Digital Tensimeter and Digital Thermometer. Data Analysis Data were analyzed using the Spearman or Pearson correlation test (according to data normality) with a confidence level of 95% ($\alpha = 0.05$).

RESULTS

Table 1. Frequency Distribution of Research Respondents

Demographic characteristics	n	%
Age		
19-30 Years	6	9,38
31-40 Years	5	7,81
41-50 Years	15	23,44
51-60 Years	18	28,13
>60 Years	20	31,25
Gender		
Male	35	54,69
Female	29	45,31
Education Level		
Elementary School	9	14,06
Junior High School	2	3,13
High School	46	71,88
College	7	10,94
Marital Status		
Divorced	2	3,13
Divorced	6	9,38
Single-handed	2	3,13
Married	54	84,38
Occupation		
Not working	24	37,50
Housewife	17	26,56
Private	17	26,56
Self-employed	4	6,25
Student	1	1,56
Civil Servant	1	1,56

Table 1 shows that the age of the respondents was mostly >60 years (31.25%) with the most gender being male (54.69%), the most education level being high school (71.88%), the most marital status being married (84.38%) with the most occupation being no longer working (37.50%).

Table 2. Relationship between Anxiety and Vital Signs of Pneumonia Patients

Tanda Vital	Anxiety							
	No Worries		Low		Medium		High	
	n	%	n	%	n	%	n	%
Blood Pressure								
Normal	18	28,1	4	6,3	5	7,8	6	9,4
Abnormal	1	1,6	2	3,1	12	18,8	16	25,0
Spearman Test	P = 0.001; Corelation coefficient = 0,786							
Respiration Rate								
Normal	16	25,0	5	7,8	4	6,5	1	1,6
Abnormal	2	3,1	3	4,7	17	26,6	16	25,0
Spearman Test	P = 0.002; Corelation coefficient = 0,689							
Pulse								
Normal	14	21,9	8	12,5	3	4,7	2	3,1
Abnormal	1	1,6	3	4,7	15	23,4	18	28,1
Spearman Test	P = 0.000; Corelation coefficient = 0,987							
Oxygen Saturation								
Normal	15	23,4	6	9,4	3	4,7	6	9,4
Abnormal	2	3,1	1	1,6	16	25,0	15	23,4
Spearman Test	P = 0.000; Corelation coefficient = 0,988							

Vital signs of pneumonia patients showed that 28.13% of patients were not anxious and had normal blood pressure, 25.00% of patients had normal respiration rate, 21.88% showed normal pulse rate and 23.44% showed normal oxygen saturation. High anxiety levels showed that 25.00% of patients had abnormal blood pressure, 25.00% of patients had abnormal respiration rate, 28.13% showed abnormal pulse rate and 23.44% of patients had abnormal oxygen saturation. The results of the study showed that anxiety had a significant relationship with blood pressure, pulse rate, respiration rate, and oxygen saturation with a p value <0.05.

DISCUSSION

Pneumonia is a serious infection of the lower respiratory tract that can result in significant inflammation of the lung parenchyma. The infection

process is characterized by the infiltration of inflammatory cells and the accumulation of fluid in the alveoli, which are microscopic air sacs in the lungs. This complex medical condition often causes significant levels of anxiety in patients, especially because the symptoms interfere with comfort and daily activities (Liu et al., 2020; Corpuz, 2024). The anxiety experienced by pneumonia patients can have a direct impact on their vital signs, including changes in blood pressure, respiratory rate, and heart rate. Inflammation of the lung parenchyma results in the manifestation of a variety of significant clinical symptoms, including shortness of breath that can interfere with normal breathing, a productive cough characterized by sputum production, and chest pain that can vary in intensity from mild to severe (Salari et al., 2021). The combination of these physical symptoms often acts as a trigger for anxiety in patients. The anxiety experienced by pneumonia patients shows a wide spectrum in terms of intensity, ranging from mild levels that are still tolerable to severe levels that require special attention. This level of anxiety is influenced by various factors, especially the severity of the disease being experienced, coupled with various psychosocial factors such as family support, understanding of the disease, past experiences with similar medical conditions, and socio-economic conditions that can affect access to health care (Goldin et al., 2021; Hasina et al., 2021).

A deep understanding of the relationship between anxiety levels and vital signs in pneumonia patients is a fundamental aspect in providing holistic and comprehensive nursing care. The complex relationship between psychological and physiological conditions needs to be fully understood by health workers in order to provide optimal care (Burgstahler and Stenson, 2020). This knowledge allows health workers to develop and implement targeted and effective interventions in managing patient anxiety, while still carefully monitoring their vital sign parameters and overall physical condition. Wijaya's (2023) study showed a significant positive correlation between anxiety levels and increased vital signs, especially blood pressure and respiratory rate, in pneumonia patients. In the study, it was found that the higher the level of anxiety experienced by patients, the more visible the increase in systolic and diastolic blood pressure parameters, and there was a statistically significant acceleration in respiratory rate. A study by Pratama et al. (2022) found that 65% of pneumonia patients experienced moderate to severe anxiety which had a significant impact on the instability of vital signs. This study, involving 150 hospitalized patients,

revealed that patients with moderate to severe anxiety levels showed greater fluctuations in their vital sign parameters, including unstable blood pressure increases, variations in respiratory rate, and more frequent pulse irregularities compared to patients with mild or no anxiety levels. Sari's research (2021) identified that good anxiety management can help stabilize the vital signs of pneumonia patients. In his study involving 80 pneumonia patients, the researcher found that patients who received a structured anxiety management intervention showed significant improvements in the stability of their vital signs (Dehghan, Namjoo, Zarei, et al., 2021). The blood pressure, respiratory rate, and pulse of patients who received anxiety management tended to be more stable compared to the control group who did not receive similar interventions.

A deep understanding of the relationship between anxiety and vital signs in pneumonia patients has great significance in nursing practice for several critical reasons: Optimizing the provision of nursing interventions by considering the psychological and physiological aspects of the patient simultaneously, which includes a thorough assessment of mental status and physical condition, continuous monitoring of changes in anxiety levels and vital signs, and adjustment of the care plan based on the patient's individual response to the interventions provided (Sutriana, Sitaesmi and Wahab, 2021; Banda et al., 2022). Improving the quality of nursing care through a more holistic approach and oriented to the individual needs of the patient, by considering not only the physical aspects but also the psychological, social, and spiritual aspects of each patient, and adapting the care plan according to the preferences, values, and unique characteristics of each individual to ensure optimal care outcomes (Oberoi et al., 2020). Accelerating the patient's recovery process by managing anxiety factors that can hinder healing, where reducing anxiety levels effectively can support immune system function, improve the patient's quality of rest, and facilitate a better response to medical therapy provided, which can ultimately optimize recovery time and shorten the length of hospitalization (Banda et al., 2022; Corpuz, 2024). Prevent unwanted complications through early detection of changes in vital signs influenced by anxiety levels, where careful monitoring of changes in parameters such as blood pressure, respiratory rate, and heart rate can help identify potential complications before they develop into more serious conditions, allowing the medical team to take timely preventive measures and avoid worsening of the patient's condition which can result in prolonged treatment or more severe health

impacts (Oberoi et al., 2020; Hasina et al., 2021).

Here are some comprehensive recommendations for managing anxiety and stabilizing vital signs in pneumonia patients: (1) Providing comprehensive education about the disease condition, including an explanation of the disease process, possible symptoms, and stages of treatment to be undergone; (2) Implementation of various relaxation techniques such as deep breathing, mindfulness meditation, positive visualization, and progressive muscle relaxation exercises that can help reduce anxiety levels; (3) Continuous psychosocial support from health workers and families, including therapeutic communication, regular counseling, and active involvement of the family in the care process; (4) Regular and systematic monitoring of vital signs with structured recording, accompanied by evaluation of change trends and responses to interventions given (Abu Khait and Lazenby, 2021; Liu et al., 2022). With a comprehensive understanding of the dynamic relationship between anxiety and vital signs, nurses can develop and implement more effective, targeted, and individualized nursing care for pneumonia patients. This understanding allows nurses to not only address the physical symptoms of the disease but also manage the psychological aspects that can affect the patient's overall recovery. This will ultimately contribute to improving the quality of care and optimal health outcomes for pneumonia patients (Miranda et al., 2020; Goldin et al., 2021).

Research on the relationship between anxiety levels and vital signs of pneumonia patients in hospitals has several limitations that need to be considered. Limitations in sampling due to pandemic conditions that may affect the number and characteristics of respondents who can participate in the study. Confounding variables that are difficult to control, such as hospital environmental factors, previous patient personal experiences, and comorbid conditions that may affect anxiety levels and vital signs. Limited observation time that may not include long-term changes in vital signs or diurnal variations that may affect the results of the study. Subjectivity in measuring anxiety levels that rely on self-report instruments and researcher interpretation. Limitations in generalizing research results because the study was conducted in one hospital with specific population characteristics. These limitations need to be considered in the interpretation of research results and can form the basis for methodological improvements in further research.

CONCLUSION

Anxiety levels in pneumonia patients are significantly associated with changes in their vital signs. Increased anxiety can trigger a physiological response through the autonomic nervous system, causing an increase in heart rate, blood pressure, and respiration as the body's coping mechanism for the stress or fear experienced by the patient.

REFERENCES

- Abu Khait, A. and Lazenby, M. (2021) 'Psychosocial-spiritual interventions among Muslims undergoing treatment for cancer: an integrative review', *BMC Palliative Care*, 20, pp. 1–22.
- Banda, K. J. et al. (2022) 'Prevalence of dysphagia and risk of pneumonia and mortality in acute stroke patients: a meta-analysis', *BMC geriatrics*, 22(1), p. 420.
- Bryan, S., Zipp, G. and Breitreuz, D. (2021) 'The Effects of Mindfulness Meditation and Gentle Yoga on Spiritual Well-Being in Cancer Survivors: A Pilot Study.', *Alternative Therapies in Health & Medicine*, 27(3).
- Burgstahler, M. S. and Stenson, M. C. (2020) 'Effects of guided mindfulness meditation on anxiety and stress in a pre-healthcare college student population: a pilot study', *Journal of American College Health*, 68(6), pp. 666–672.
- Corpuz, J. C. G. (2024) 'The importance of spiritual mindfulness in palliative care', *American Journal of Hospice and Palliative Medicine®*, 41(10), pp. 1258–1259.
- Dehghan, M., Namjoo, Z., Mohammadi Akbarabadi, F., et al. (2021) 'The relationship between anxiety, stress, spiritual health, and mindfulness among patients undergoing hemodialysis: A survey during the COVID-19 outbreak in Southeast Iran', *Health Science Reports*, 4(4), p. e461.
- Dehghan, M., Namjoo, Z., Zarei, A., et al. (2021) 'The relationship between coronavirus anxiety, mindfulness and spiritual health in patients with cancer: a survey in Southeast Iran', *Psychiatry Investigation*, 18(5), p. 443. doi: 10.30773/pi.2020.0441.
- Goldin, P. R. et al. (2021) 'Evaluation of cognitive behavioral therapy vs mindfulness meditation in brain changes during reappraisal and acceptance among patients with social anxiety disorder: a randomized clinical trial', *JAMA psychiatry*,

78(10), pp. 1134–1142.

- Hasina, S. N. et al. (2021) 'Mindfulness Meditation Based on Spiritual Care to Reduce Community Anxiety due to the Impact of Pandemic Coronavirus Disease', 9, pp. 41–46. doi: <https://doi.org/10.3889/oamjms.2021.6487>.
- Hoge, E. A. et al. (2020) 'Treatment for anxiety: Mindfulness meditation versus escitalopram (TAME): Design of a randomized, controlled non-inferiority trial', *Contemporary Clinical Trials*, 91, p. 105965.
- Joshi, A. M. et al. (2021) 'Effect of Mindfulness-Based Art Therapy (MBAT) on psychological distress and spiritual wellbeing in breast cancer patients undergoing chemotherapy', *Indian journal of palliative care*, 27(4), p. 552.
- Li, Y.-F. et al. (2020) 'Effects of mindfulness meditation on anxiety, depression, stress, and mindfulness in nursing students: A meta-analysis and trial sequential analysis of randomized controlled trials', *Frontiers of Nursing*, 7(1), pp. 59–69.
- Liu, C. et al. (2020) 'The effect of loving-kindness meditation on flight attendants' spirituality, mindfulness and subjective well-being', in *Healthcare*. MDPI, p. 174. doi: 10.3390/healthcare8020174.
- Liu, C. et al. (2022) 'Effects of mindfulness meditation on doctors' mindfulness, patient safety culture, patient safety competency and adverse event', *International journal of environmental research and public health*, 19(6), p. 3282.
- Miranda, T. P. S. et al. (2020) 'Intercessory prayer on spiritual distress, spiritual coping, anxiety, depression and salivary amylase in breast cancer patients during radiotherapy: Randomized clinical trial', *Journal of religion and health*, 59, pp. 365–380.
- Najafi, K. et al. (2022) 'Relationship between spiritual health with stress, anxiety and depression in patients with chronic diseases', *International Journal of Africa Nursing Sciences*, 17, p. 100463.
- Obero, S. et al. (2020) 'Association of mindfulness-based interventions with anxiety severity in adults with cancer: a systematic review and meta-analysis', *JAMA network open*, 3(8), pp. e2012598–e2012598.
- Ozdemir, S. et al. (2022) 'Advanced cancer patients' prognostic awareness and its association with anxiety, depression and spiritual well-being: a multi-country study in Asia', *Clinical Oncology*, 34(6), pp. 368–375.
- Pouyanfard, S. et al. (2020) 'Effectiveness of mindfulness-integrated cognitive behavior therapy on anxiety, depression and hope in multiple sclerosis patients: a randomized clinical trial', *Trends in psychiatry and psychotherapy*, 42(1), pp. 55–63.
- Reisi, S. et al. (2021) 'The effect of religion and spirituality on anxiety and depression in cancer patients: A review article', *Medicine*, 6(1), pp. 75–86.
- Salari, N. et al. (2021) 'Effects of counselling and spiritual care program on anxiety in patients with chronic diseases: A systematic review and meta-analysis', *Current Psychology*, pp. 1–10.
- Solomon, Y. et al. (2022) 'Prevalence of pneumonia and its determinant factors among under-five children in Gamo Zone, southern Ethiopia, 2021', *Frontiers in Pediatrics*, 10, p. 1017386.
- Sutriana, V. N., Sitaresmi, M. N. and Wahab, A. (2021) 'Risk factors for childhood pneumonia: a case-control study in a high prevalence area in Indonesia', *Clinical and experimental pediatrics*, 64(11), p. 588.