

# Effectiveness of Implementing Supportive Sound (Wellness Therapy) to Improve Sleep Quality in Tuberculosis Patients

1,2Saharuddin\*, 3,4Yani Sofiani, 4,5,6 Ninik Yunitri, 3Fitri Rayasari

<sup>1</sup>Student of the Spesialis medical surgery Study Program in Nursing, Faculty of Nursing, Universitas Muhammadiyah Jakarta, Jakarta, Indonesia

<sup>2</sup>Medical surgical nursing department, Stikes Graha Edukasi, Makassar, Indonesia

<sup>3</sup>Medical-Surgical Nursing Department, Faculty of Nursing, Universitas Muhammadiyah Jakarta, Jakarta, Indonesia

<sup>4</sup>Faculty of Nursing, Universitas Muhammadiyah Jakarta, Jakarta, Indonesia

<sup>5</sup>Mental health and Psychiatry Nursing Department, Faculty of Nursing, Universitas Muhammadiyah Jakarta, Jakarta, Indonesia

<sup>6</sup>Master of Nursing Study Program, Faculty of Nursing, Universitas Muhammadiyah Jakarta, Jakarta, Indonesia

<sup>7</sup>Ners Study Program, Faculty of Nursing, Universitas Muhammadiyah Jakarta, Jakarta, Indonesia



Proceeding STIKep PPNI Jawa Barat

## Website :

<https://proceedings.stikep-ppnijabar.ac.id/index.php/psi>

Volume 1 (1), 148-154

## Article info

Received : March 27, 2025  
Revised : April 22, 2025  
Accepted : April 28, 2025  
Published : May 15, 2025

## Corresponding author

Saharuddin  
Universitas Muhammadiyah Jakarta  
Jl. Cemp. Putih Tengah I, Jakarta, Indonesia  
Email: sahar.andhika@gmail.com

## Citation

Saharuddin, Sofiani, Y., Yunitri, N., & Rayasari, F. (2025). Effectiveness Of Implementing Supportive Sound (Wellness Therapy) To Improve Sleep Quality In Tuberculosis Patients. *Proceeding STIKep PPNI Jawa Barat*, 1(1), 148-154.

This is an **Open Access** article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License



## INTRODUCTION

Tuberculosis (TB) is one of the leading causes of death in the world, especially among people with HIV (Getahun et al., 2010). WHO reports that in 2022, TB caused the deaths of around 1.3 million people, making it the second leading cause of infectious death after COVID-19 (Meng et al., 2023). Indonesia is among the eight countries with the highest TB burden, contributing 87% of

the total global cases in 2022, with a very high prevalence in the provinces of West Java and East Java Kwekkeboom et al., (2012) In South Sulawesi, the prevalence of pulmonary TB is also significant, with Makassar reporting the highest number of cases (Rios et al., 2019). Data from the Health Service shows that in 2020, there were 18,863 cases of pulmonary TB, and in 2023, pulmonary TB will be one of the most common

## Abstract

**Objective:** To assess the effectiveness of nature sound music therapy (sound supportive wellness therapy) in improving sleep quality in pulmonary TB patients.

**Method:** The study used a pre-experimental design with 7-day observation. A total of 17 pulmonary TB patients at the Labuan Baji Hospital, Makassar underwent music therapy for 7 sessions with a duration of 40-60 minutes per session. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) before and after the intervention

**Results:** More than half of the respondents were female (58.82 %), with the average of age was 46 years old. After the intervention, there was a significant increase in sleep quality in pulmonary TB patients with a moderate effect (Cohen's  $d = 0.46$ ;  $P < 0.05$ ). The greatest improvement was seen in subjective sleep quality (Cohen's  $d=1.13$ ) and sleep latency (Cohen's  $d=0.50$ ). The smallest improvement was in sleep duration (Cohen's  $d=0.25$ ).

**Conclusion:** Natural sound music therapy is effective in improving sleep quality in pulmonary TB patients, especially in terms of subjective sleep quality, sleep latency and sleep effectiveness. This intervention provides physiological and psychological benefits, supporting the improvement of quality of life in TB patients

**Keywords:** Tuberculosis, sleep quality, music therapy, wellness therapy, sound supportive therapy

diseases at Labuan Baji Hospital, Makassar (Patel et al., 2014).

People with pulmonary TB often experience physical symptoms such as coughing, shortness of breath, and chest pain, which can disrupt their sleep quality (Poongkunran et al., 2015). Research shows that these sleep disorders can be exacerbated by psychological factors such as anxiety and stress resulting from worsening health conditions (Aslam et al., 2023). A previous study shows a relationship between anxiety, night coughing, and chest pain with the sleep quality of TB patients, which is in line with findings that clinical symptoms of TB can interfere with basic human needs, including sleep (Staines et al., 2022). Sleep disturbances experienced by TB patients can have a negative impact on their physiological and psychological balance, causing decreased immunity and increased risk of depression (Lee et al., 2018).

Non-pharmacological interventions, such as sleep hygiene practices, have been recommended to improve sleep quality (Weber et al., 2020). Sleep hygiene includes setting a sleep schedule, nightly routine, and creating an optimal sleep environment (Sun et al., 2022). Research shows a significant relationship between sleep hygiene and sleep quality in the elderly, and also in patients with pulmonary TB (Yang et al., 2020). Music therapy, particularly nature sounds, has been shown to be effective in improving sleep quality and reducing symptoms of depression (H.-W. Huang et al., 2015). Research shows that nature sounds can have a sedative effect, reduce tension and anxiety, and promote relaxation (D. Huang et al., 2023). A previous study reported that nature sound music therapy can be applied in the treatment of patients with sleep disorders, and the study showed significant differences in sleep quality before and after nature sound music therapy (Gee et al., 2019). Thus, music therapy can be an effective non-pharmacological solution to improve sleep quality in TB patients.

## **METHOD**

### **Study Design**

This study employed a pre-experimental design with an observational approach to assess the

effectiveness of Sound Supportive (Wellness Therapy) in enhancing sleep quality among pulmonary tuberculosis patients. The intervention aimed to provide a non-pharmacological method to support relaxation and improve overall restfulness in hospitalized TB patients.

### **Population and Sample**

The study population was patients with pulmonary TB undergoing treatment at RSUD Labuan Baji. The sample was determined using a purposive sampling technique, with inclusion criteria including patients aged >18 years, experiencing sleep disorders as evidenced by a Pittsburgh Sleep Quality Index (PSQI) score >5, and willing to participate in all therapy sessions. Exclusion criteria included patients with severe psychiatric disorders, use of sedative drugs that could not be stopped during the study, and health conditions that prevented full participation. Of the 25 patients selected, 5 patients were excluded, and 3 patients dropped out during the program, so that 17 participants completed the study.

### **Instruments**

The primary outcome measure was patient sleep quality, assessed using the Pittsburgh Sleep Quality Index (PSQI). The PSQI measures seven components of sleep quality: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. A lower PSQI total score indicates better sleep quality. Response Format: A 4-point Likert scale (1 = not true at all, 4 = completely true). Total score for each subscale by summing the item responses. Higher scores indicate stronger tendencies in the sleep quality.

### **Intervention Protocol**

The intervention was carried out for 7 days, with each session lasting 40-60 minutes. This study was conducted at RSUD Labuan Baji, Makassar in April-March 2024. During the seven therapy sessions, each participant attended sessions with an average duration of 43 minutes in a quiet and comfortable room, according to a standard

protocol. The therapy was carried out using a combination of natural sounds that were adjusted to create optimal relaxation. There were no incidents of deviation from the SOP, although some participants needed time to adapt in the initial sessions to become comfortable with the therapy techniques. The facilitator team provided individual support to ensure that all patients were able to complete the sessions well.

**Data Analysis**

Data were analyzed using paired t-test to compare PSQI scores before and after the intervention. The magnitude of the intervention effect was assessed using Cohen’s d, which indicates the level of change in each component of the PSQI. Statistical analysis was performed with a significance level of  $p < 0.05$ , and the results showed that all components of sleep quality experienced significant changes after the

intervention. The largest change occurred in subjective sleep quality (Cohen’s  $d = 1.13$ ), while the smallest change was found in sleep duration (Cohen’s  $d = 0.25$ ).

**RESULTS**

Of the total 25 patients selected, 5 patients were excluded because they did not meet the inclusion criteria (2 patients with severe psychiatric comorbidities and 3 patients were unable to follow the therapy schedule consistently). A total of 20 participants met the criteria and started the intervention, but 3 participants dropped out during the program due to worsening health conditions and the need for intensive care. Thus, a total of 17 participants completed the program to the end and their data were analyzed. Supportive sound therapy was conducted in seven sessions with an average duration of 43 minutes. During the therapy, all participants completed the therapy to completion

**Table 1 Demographic Data Frequency Distribution of Pulmonary TB Patients (n=17)**

Variable	Mean (±SD)	F (%)
Age	46 ±52	
Sleep Quality Baseline, <i>mean (SD)</i>	16.53 ±12.12	
Gender		
Male		7 (41.18 %)
Female		10 (58.82 %)
Work		
Housewife		10 (58.82 %)
Farmer		5 (29.42 %)
Self-employed		2 (11.76 %)
Level of education		
No school		1 (5.88 %)
Elementary school		6 (35.29 %)
Junior high school		6 (35.29 %)
Senior high school		4 (23.53 %)

Table 1 shows that the majority of respondents were female (58.82%), with an average age of 46 years. Most participants were housewives, accounting for 58.82% of the sample. The mean score for sleep quality among the respondents was 16.35, with a standard deviation of ±12.12, indicating varied sleep experiences.

**Table 2 Patient Sleep Quality Before and After in the Sound Supportive Intervention Group (Wellness Therapy) in TB Patients (n=17)**

Outcome	Measurement		P-value	Cohens’d
	Pre	Post		

	Mean	SD	Mean	SD		
<b>Total sleep quality PSQI</b>	16,53	1,23	4.41	1,00	<b>≤0.001</b>	<b>0.46</b>
Subjective sleep quality	2.29	0,47	0.76	0,44	≤0.001	1.13
Sleep Latency	2.18	0,39	0.76	0,44	≤0.001	0.50
Sleep Duration	2.59	0,51	0.65	0,49	≤0.001	0.25
Sleep efficiency	2.24	0,44	0.47	0,51	≤0.001	0.42
Sleep Disturbance	2.59	0,51	0.47	0,51	≤0.001	0.43
Sleep medication use	2.34	0,43	0.59	0,51	≤0.001	0.30
Daytime dysfunction due to sleepiness	2.41	0,51	0.71	0,47	≤0.001	0.40

Abbreviation. Pittsburgh sleep quality index (PSQI); note. Statistical test paired t test

After receiving therapy, there was a significant decrease in sleep disturbances with moderate effect size changes (Cohens'  $d = 0.46$ ;  $MD = 12.12$ ;  $SD = 0.71$ ;  $95\%CI =$ ). Analysis based on specific sleep disturbances showed that subjective sleep quality, sleep latency, sleep duration, effective sleep duration, sleep disturbances, use of sleeping pills, and daytime concentration disorders also experienced significant changes after receiving therapy ( $p < 0.05$ ). The highest average change in value was seen in subjective sleep quality (Cohens'  $d = 1.13$ ) and sleep latency (Cohens'  $d = 0.50$ ). While the lowest change occurred in sleep duration (Cohens'  $d = 0.25$ ) (Table 2).

## DISCUSSION

Sound Supportive (Wellness Therapy) intervention has a significant impact on the sleep quality of pulmonary TB patients because this therapy is designed to provide physical and psychological relaxation effects. The music used during therapy can stimulate the limbic system in the brain, which is responsible for regulating emotions and sleep. This stimulation helps increase the release of hormones such as serotonin and melatonin, which play an important role in regulating the sleep cycle. As a result, it plays an important role in regulating the sleep cycle. As a result, patients experience better sleep, longer sleep duration, and shorter sleep latency. Decreased anxiety and stress during therapy also affect the improvement of subjective sleep quality, which is proven to have the greatest effect on changes in patient scores. In addition, this therapy helps reduce sleep disturbances caused by internal and external

factors, such as disturbing thoughts or an unsupportive environment. With an average session length of 43 minutes and a consistent approach over seven sessions, patients begin to develop healthier sleep habits. This improved sleep quality also has a positive impact on daily activities, such as reducing concentration disturbances and reducing the need for sleeping medication. This intervention not only helps patients get better quality sleep, but also improves their overall quality of life. The implementation of Evidence-Based Nursing Practice (EBNP) sound supportive therapy at RSUD Labuan Baji showed significant results in improving the sleep quality of patients with pulmonary tuberculosis (pulmonary TB). This therapy was carried out for seven sessions with a duration of between 30 to 60 minutes, and was given at night to maximize the expected relaxation effect. Patients with respiratory disorders, such as those that occur in pulmonary TB, often experience poor sleep quality due to shortness of breath and disturbing coughs, especially at night (Zhang et al., 2010), (Khuntee et al., 2022).

Research shows that music can provide a significant relaxation effect, which contributes to improving the quality of sleep in patients. Amiri et al., (2019) In this context, sound supportive therapy functions in a similar way to other music therapies, which evaluate the effectiveness of Murottal Al-Quran therapy on the sleep quality of haemodialysis patients. Music therapy, including sound supportive, can increase the production of endorphin hormones that play a role in creating feelings of comfort and relaxation Moreno-Morales et al., (2020)

and González-Martín-Moreno et al., (2021) This hormone functions to stimulate delta brain waves, which contribute to better sleep quality. Widiyono et al., (2019) In addition, the relaxing effect resulting from listening to music can activate the autonomic nervous system, which in turn affects the production of neurotransmitters such as serotonin and enkephalin, which are important for regulating mood and sleep quality Handayani et al., (2023). Listening to music with a slow tempo can trigger vibrations that stimulate the hearing organs and convert them into electrical impulses that are sent through the auditory nerve (Aalbers et al., 2019). These impulses not only affect the perception of sound, but can also stimulate the brain to produce neuropeptides that provide positive feedback in the form of comfort and calm (Khuntee et al., 2022). This process contributes to the release of chemicals such as serotonin and endorphins into the circulation, which can improve sleep quality and reduce anxiety (Dekhoda, 2018). Research by Mukkarramah (2021) shows that music stimulation can activate the limbic system, which plays a role in regulating emotions and responses to stress, thereby creating an atmosphere conducive to better sleep (Liu et al., 2019). Overall, the implementation of EBNP sound supportive therapy at Labuan Baji Regional Hospital not only provides benefits in improving the sleep quality of pulmonary TB patients, but also shows alignment with previous research showing that music therapy can reduce anxiety and increase relaxation [27, 28]. Thus, this therapy can be considered an effective intervention and has the potential to be applied more widely in the context of treating patients with sleep disorders due to underlying medical conditions.

## CONCLUSION

Wellness therapy was effective in reducing sleep disturbances among patients with pulmonary tuberculosis. Following the intervention, significant improvements were observed in several aspects of sleep quality, including subjective sleep perception, reduced time to fall asleep, longer and more effective sleep duration,

fewer nighttime disturbances, reduced reliance on sleeping medication, and better daytime alertness. These findings indicate that wellness therapy is a beneficial non-pharmacological approach for enhancing overall sleep quality in TB patients during treatment and recovery.

## Acknowledgement

The researcher sincerely expresses gratitude to all patients who participated in this study and to the healthcare staff of the pulmonary ward for their cooperation and support during the research process. Appreciation is also extended to academic supervisors and colleagues for their valuable guidance, feedback, and encouragement throughout the completion of this study.

## Conflict of Interest

The author declares no conflict of interest related to the design, implementation, or publication of this research.

## REFERENCES

- Aalbers, S., Vink, A., Freeman, R., Pattiselanno, K., Spreen, M., & van Hooren, S. (2019). Development of an improvisational music therapy intervention for young adults with depressive symptoms: An intervention mapping study. *The Arts in Psychotherapy*, 65, 101584.
- Amiri, S., Fard, A. P., Khaledi-Paveh, B., Foroughi, A., Bavafa, A., Bazani, M., et al. (2019). The effectiveness of music therapy on insomnia using Persian traditional music. *Journal of Kermanshah University of Medical Sciences*, 23(2).
- Aslam, M. N. (2023). Weighted blanket therapy for periodic limb movement disorder: A case report highlighting improved sleep quality and reduced symptoms. *Cureus*.
- Dehkoda, F., & Vinayak, S. (2018). A study on analgesic effect of music interventions after chemotherapy or radiotherapy in cancer patients. *International Journal of Indian Psychology*, 6(2).
- Gee, B., Orchard, F., Clarke, E., Joy, A., Clarke, T., & Reynolds, S. (2019). The effect of non-pharmacological sleep interventions on depression symptoms: A meta-analysis of

- randomised controlled trials. *Sleep Medicine Reviews*, 43, 118–128.
- Getahun, H., Gunneberg, C., Granich, R., & Nunn, .P. (2010). HIV infection-associated tuberculosis: The epidemiology and the response. *Clinical Infectious Diseases*, 50(S3), S201–S207.
- González-Martín-Moreno, M., Garrido-Ardila, E. M., Jiménez-Palomares, M., González-Medina, G., Ruiz, P. O., & Rodríguez-Mansilla, J. (2021). Music-based interventions in paediatric and adolescents oncology patients: A systematic review. *Children*, 8(2), 73.
- Handayani, D. (2023). The effect of music therapy on improving sleep quality in children during hospitalization: Literature review. *PICNHS*, 4(1), 155–162.
- Huang, D. (2023). Different nursing interventions on sleep quality among critically ill patients: A systematic review and network meta-analysis. *Medicine*, 102(52), e36298.
- Huang, H., Zheng, B. L., Jiang, L., Lin, Z., Zhang, G., Shen, L., et al. (2015). Effect of oral melatonin and wearing earplugs and eye masks on nocturnal sleep in healthy subjects in a simulated intensive care unit environment: Which might be a more promising strategy for ICU sleep deprivation? *Critical Care*, 19(1).
- Husna, C. H. A. (2023). The effect of Islamic music therapy for reducing pain in CKD patients undergoing hemodialysis. *KNE Medicine*.
- Khuntee, W., Hanprasitkam, K., & Sumdaengrit, B. (2022). Effect of music therapy on postembolization syndrome in Thai patients with hepatocellular carcinoma: A quasi-experimental crossover study. *Belitung Nursing Journal*, 8(5), 396–404.
- Kim, Y., & Kim, Y. L. (2018). Non-pharmacological therapies for sleep disturbances in people with Parkinson's disease: A systematic review. *Journal of Advanced Nursing*, 74(8), 1741–1751.
- Kwekkeboom, K. L., Abbott-Anderson, K., Cherwin, C., Roiland, R., Serlin, R. C., & Ward, S. E. (2012). Pilot randomized controlled trial of a patient-controlled cognitive-behavioral intervention for the pain, fatigue, and sleep disturbance symptom cluster in cancer. *Journal of Pain and Symptom Management*, 44(6), 810–822.
- Liu, H., Gao, X., & Hou, Y. (2019). Effects of mindfulness-based stress reduction combined with music therapy on pain, anxiety, and sleep quality in patients with osteosarcoma. *Brazilian Journal of Psychiatry*, 41(6), 540–545.
- Meng, J. (2023). Non-pharmacological interventions for improving sleep in people living with HIV: A systematic narrative review. *Frontiers in Neurology*, 14.
- Moreno-Morales, C., Calero, R., Moreno-Morales, P., & Pintado, C. (2020). Music therapy in the treatment of dementia: A systematic review and meta-analysis. *Frontiers in Medicine (Lausanne)*, 7.
- Naulia, R. P., Allenidekania, A., & Hayati, H. (2019). The effect of music therapy on sleep quality among children with chronic illness. *International Journal of Nursing and Health Services*, 2(1), 15–20.
- Patel, J., Baldwin, J., Bunting, P. S., & Laha, S. (2014). The effect of a multicomponent multidisciplinary bundle of interventions on sleep and delirium in medical and surgical intensive care patients. *Anaesthesia*, 69(6), 540–549.
- Poongkunran, C., John, S., Kannan, A., Shetty, S., Bime, C., & Parthasarathy, S. (2015). A meta-analysis of sleep-promoting interventions during critical illness. *The American Journal of Medicine*, 128(10), 1126–1137.e1.
- Rios, P., Cardoso, R., Morra, D. E., Nincic, V., Goodarzi, Z., Farah, B., et al. (2019). Comparative effectiveness and safety of pharmacological and non-pharmacological interventions for insomnia: An overview of reviews. *Systematic Reviews*, 8(1).
- Staines, A. C., Broomfield, N. M., Pass, L., Orchard, F., & Bridges, J. (2021). Do non-

- pharmacological sleep interventions affect anxiety symptoms? A meta-analysis. *Journal of Sleep Research*, 31(1).
- Stegemann, T., Geretsegger, M., Quoc, P. E., Riedl, H., & Smetana, M. (2019). Music therapy and other music-based interventions in pediatric health care: An overview. *Medicines*, 6(1), 25.
- Sun, Y., Zhu, S. N., Zhang, C., Li, S. L., & Wang, D. (2022). Effect of low-dose dexmedetomidine on sleep quality in postoperative patients with mechanical ventilation in the intensive care unit: A pilot randomized trial. *Frontiers in Medicine (Lausanne)*, 9.
- Weber, M., Schnorr, T., Morat, M., Morat, T., & Donath, L. (2020). Effects of mind-body interventions involving meditative movements on quality of life, depressive symptoms, fear of falling and sleep quality in older adults: A systematic review with meta-analysis. *International Journal of Environmental Research and Public Health*, 17(18), 6556.
- Widiyono, W., Setiyarini, S., & Effendy, C. (2019). Self-selected individual music therapy for depression during hospitalization for cancer patients: Randomized controlled clinical trial study. *Indonesian Journal of Cancer*, 13(3), 59.
- Yang, G., Wang, B., Mengyao, C., Chen, H., Liu, H., & Zhu, B. (2022). Analysis of characteristics of workers with occupational benzene poisoning in Jiangsu Province, 2006–2018. *Journal of Clinical Images and Medical Case Reports*, 3(3).
- Zhang, S. R., Yan, H., Zhang, J., Zhang, T., Li, X., & Zhang, Y. (2010). The experience of college students with pulmonary tuberculosis in Shaanxi, China: A qualitative study. *BMC Infectious Diseases*, 10(1).