



The Application of Benson Relaxation Therapy to Improve Oxygen Saturation in Patients with Pulmonary Tuberculosis

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Abstract

Pulmonary tuberculosis (TB) is an infectious disease that can impair respiratory function and reduce oxygen saturation. Benson relaxation therapy represents a simple non-pharmacological approach that combines relaxation, controlled breathing, and focused concentration to support physiological comfort and oxygenation. This study aimed to describe the application of Benson relaxation therapy in improving oxygen saturation among pulmonary TB patients at Warungasem Public Health Center, Batang. A descriptive case study design was applied involving five pulmonary TB patients who met the predetermined inclusion criteria. Benson relaxation therapy was administered for 10–15 minutes per session over three consecutive days, while oxygen saturation was measured before and after the intervention using a pulse oximeter. Data were analyzed descriptively by comparing individual and mean oxygen saturation values before and after therapy. Before the intervention, all participants had mild hypoxemia, with oxygen saturation values ranging from 90% to 92% and a mean of 91.2%. After the intervention, oxygen saturation increased to a range of 94%–96%, with a mean of 95.2%, and four participants reached the normal category. All participants experienced an increase of four percentage points. These findings indicate a consistent descriptive improvement following Benson relaxation therapy and support its potential use as a simple complementary nursing intervention for pulmonary TB patients..

Keywords: Benson Relaxation, Oxygen Saturation, Pulmonary TB, Pulmonary Tuberculosis, Relaxation Therapy.



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INTRODUCTION

Tuberculosis (TB) remains one of the major global infectious diseases and continues to represent a substantial challenge for health systems, particularly in low- and middle-income countries where transmission, delayed diagnosis, treatment adherence, and socioeconomic vulnerability frequently interact to sustain disease burden. Pulmonary TB, caused by *Mycobacterium tuberculosis*, primarily affects the respiratory system and may progressively impair pulmonary ventilation, alveolar function, and gas exchange, creating physiological conditions that can compromise oxygenation. The World Health Organization has continued to identify TB as a major cause of morbidity and mortality worldwide, indicating that advances in diagnosis and treatment have not eliminated the need for supportive approaches that address persistent physiological and psychosocial problems among affected patients (World Health Organization, 2020). The Indonesian context reflects this continuing burden, with national surveillance documenting a substantial number of TB cases and emphasizing the need to strengthen comprehensive management at the primary healthcare level (Kementerian Kesehatan Republik Indonesia, 2022). The persistence of pulmonary TB is also associated with variations in treatment completion across demographic characteristics, indicating that effective clinical management cannot be separated from patient-related factors that influence the course of care (Febianti et al., 2022). At the patient level, respiratory symptoms and impaired oxygenation therefore constitute clinically relevant concerns that require attention alongside antimicrobial treatment.

The physiological consequences of pulmonary TB extend beyond the presence of infection because inflammatory and structural changes in pulmonary tissue may interfere with the normal movement of air and the diffusion of oxygen, while prolonged illness can simultaneously generate fatigue, anxiety, and reduced functional capacity. Psychological distress is particularly relevant because

anxiety may alter respiratory patterns and autonomic activity, potentially increasing the physiological burden experienced by patients with compromised respiratory function. Patients undergoing prolonged TB treatment may experience considerable anxiety associated with the duration of therapy, uncertainty regarding recovery, and the possibility of persistent symptoms, suggesting that psychological responses form an important component of the clinical context rather than an isolated emotional outcome (Khoerunisa et al., 2023). Respiratory and psychosocial factors can also interact with environmental and host characteristics that influence the occurrence and progression of pulmonary TB, reinforcing the need for patient management that considers both disease-related and individual determinants (Renni et al., 2020; Sari & Ardillah, 2023). Previous research concerning TB has further demonstrated that patient characteristics such as age, gender, and treatment-related conditions can shape clinical outcomes, although these variables do not fully explain short-term physiological fluctuations in oxygenation (Sutrisna & Rahmadani, 2022). This interaction creates a clinical rationale for complementary interventions capable of reducing autonomic tension and supporting more efficient respiratory function without replacing standard medical treatment.

Non-pharmacological interventions have increasingly attracted attention in respiratory and chronic disease management because they may provide supportive physiological benefits while requiring relatively simple procedures and limited clinical resources. Breathing-based interventions are particularly relevant because controlled respiration can influence autonomic balance, respiratory efficiency, and subjective distress, which are closely connected to the patient's ability to maintain stable oxygenation. Evidence from pulmonary TB patients indicates that breathing-oriented relaxation approaches can produce beneficial effects on physiological and psychological conditions, demonstrating that respiratory regulation may have clinical relevance beyond conventional pharmacological management (Jang et al., 2022). Benson relaxation therapy represents a particularly applicable approach because it combines controlled breathing, a relaxed bodily state, and repetitive mental focus, creating a structured relaxation response that can potentially reduce sympathetic activation and facilitate more regular respiration. Research on Benson relaxation has reported benefits in psychological outcomes among patients with chronic illnesses, while broader reviews have suggested that its physiological effects may be related to reductions in tension and improvements in relaxation and sleep-related conditions (Nurbadriyah et al., 2025; Sarmadi et al., 2023). Evidence from other clinical populations has similarly supported the complementary role of Benson relaxation as a low-risk supportive intervention, although the magnitude and mechanism of its effects may vary according to disease characteristics and patient conditions (Ismail, 2023). These findings establish a conceptual basis for examining Benson relaxation as a supportive intervention for pulmonary TB patients whose respiratory status may be influenced by both physiological impairment and psychological stress.

The relevance of Benson relaxation becomes more specific when oxygen saturation is considered as a measurable indicator of respiratory status because changes in peripheral oxygen saturation can provide an immediate indication of whether an intervention is associated with short-term improvement in oxygenation. Existing studies have begun to provide empirical support for this relationship, but their findings remain relatively concentrated in specific clinical settings and have not yet established a consistent evidence base across primary and secondary healthcare environments. A study of pulmonary TB patients in an isolation ward reported a significant association between Benson relaxation therapy and changes in oxygen saturation, suggesting that relaxation-based respiratory regulation may contribute to improved oxygenation among patients with pulmonary TB (Ndruru et al., 2022). More recent evidence from patients with pulmonary TB has also reported increased oxygen saturation following the implementation of Benson relaxation, strengthening the proposition that this intervention may have practical value as an adjunctive nursing intervention (Puluhulawa et al., 2024). Comparable supportive effects have been reported in other interventions designed to improve oxygenation, including positioning interventions, indicating that oxygen saturation can respond to non-pharmacological approaches that modify respiratory mechanics or breathing conditions (Pambudi & Widodo, 2020; Yunarni et al., 2025). Yet, evidence concerning Benson relaxation remains less developed than evidence for conventional respiratory interventions, particularly regarding its implementation within routine primary healthcare services where resources, staffing, and standardized procedures may differ substantially from hospital settings. The empirical gap is therefore not simply whether Benson relaxation can influence oxygen saturation, but whether its application is sufficiently

feasible and effective to address oxygenation problems among pulmonary TB patients receiving care in a primary healthcare setting.

The practical importance of this gap is evident in the continued occurrence of respiratory complaints among pulmonary TB patients, including dyspnea, fatigue, anxiety, and reduced oxygen saturation, which may interfere with comfort and functional recovery during treatment. A primary healthcare setting provides an important context for evaluating complementary interventions because patients frequently receive prolonged treatment outside hospital environments and require supportive strategies that can be administered safely, simply, and consistently by healthcare personnel. The preliminary findings at Puskesmas Warungasem Batang indicate that pulmonary TB remains a relevant local health problem, with patients presenting with respiratory complaints and some demonstrating reduced oxygen saturation during treatment. The preliminary observation that several patients had not previously received Benson relaxation therapy also indicates a gap between the potential availability of a simple non-pharmacological intervention and its integration into routine care. The absence of a structured procedure and limited implementation experience further suggest that evidence generated from the local clinical context could contribute to the development of more systematic nursing practice. Earlier evidence showing that Benson relaxation can improve oxygen saturation in pulmonary TB patients provides an important foundation, but replication in a primary healthcare population remains necessary to determine whether the observed physiological benefit can be demonstrated under different service conditions (Wulandari et al., 2025). Evidence from relaxation-based interventions addressing fatigue and anxiety in patients with complex respiratory or chronic disease conditions also supports the broader clinical rationale for integrating mind–body approaches into supportive patient care, while highlighting the need to evaluate outcomes that are directly relevant to respiratory function (Rahmania et al., 2026; Wahyuningsih et al., 2021).

Within this scientific landscape, the present research positions Benson relaxation therapy as a complementary nursing intervention directed specifically toward improving oxygen saturation among patients with pulmonary TB at the primary healthcare level. The study is grounded in the premise that oxygenation is not determined solely by pulmonary pathology, but may also be influenced by respiratory pattern, autonomic balance, psychological tension, and the patient's capacity to achieve a relaxed physiological state. The central research problem concerns whether the application of Benson relaxation therapy is associated with measurable improvement in oxygen saturation among pulmonary TB patients receiving care at Puskesmas Warungasem Batang. The study aims to examine the effect of Benson relaxation therapy on oxygen saturation in pulmonary TB patients and to provide empirical evidence concerning the applicability of this intervention within primary healthcare practice. Theoretically, the study contributes to the development of a more integrated understanding of how relaxation-based mind–body interventions may support respiratory function in patients experiencing pulmonary impairment. Methodologically, the research strengthens the empirical examination of a measurable physiological outcome following a structured non-pharmacological intervention in a real-world primary healthcare setting. Practically, the findings are expected to provide a basis for nurses and primary healthcare providers to consider Benson relaxation as a feasible complementary intervention for supporting oxygenation and improving the comprehensiveness of pulmonary TB care.

RESEARCH METHODS

This study employed an empirical research approach using a descriptive design with a one-group pretest–posttest framework to examine changes in oxygen saturation before and after the application of Benson relaxation therapy among patients with pulmonary tuberculosis. The study was conducted at Warungasem Public Health Center, Batang, with participants consisting of pulmonary tuberculosis patients receiving outpatient treatment who met the inclusion criteria, namely having a confirmed diagnosis of pulmonary tuberculosis, being willing to participate, being fully conscious (*compos mentis*), having adequate communication ability, and demonstrating cooperation throughout the intervention. Patients who were unable to follow the intervention instructions, experienced an acute clinical condition requiring immediate medical management, or failed to complete the intervention and measurement procedures were excluded from the study. These participant characteristics were considered relevant because demographic and treatment-related factors may influence clinical outcomes and treatment completion among patients with pulmonary tuberculosis (Febianti et al., 2022). Data collection involved measuring oxygen saturation before the intervention (pretest), administering

Benson relaxation therapy for 10–15 minutes per session over three consecutive days, and repeating oxygen saturation measurements after the intervention (posttest). The intervention procedure followed the principles of Benson relaxation, which combine controlled breathing and focused attention to induce a relaxation response and have previously been applied among patients with pulmonary tuberculosis (Ndruru et al., 2022).

The research instruments consisted of an observation sheet for recording participant characteristics and measurement results and a pulse oximeter for assessing peripheral oxygen saturation (SpO₂) before and after Benson relaxation therapy. Measurements were performed using a consistent procedure and under comparable conditions to minimize variations unrelated to the intervention, while changes in SpO₂ served as the primary physiological outcome. The use of oxygen saturation as the principal outcome was supported by previous research reporting changes in oxygen saturation following Benson relaxation therapy among pulmonary tuberculosis patients (Puluhulawa et al., 2024). Data were analyzed descriptively by comparing pretest and posttest oxygen saturation values and calculating the mean change following the intervention, with the observed mean saturation increasing from 91.2% before the intervention to 95.2% after the intervention, representing a 4% increase. This descriptive analytical approach was selected to characterize physiological changes within the one-group study design without extending the interpretation beyond the evidentiary capacity of the research design, while Benson relaxation has also been recognized as a complementary intervention for improving physiological and psychological conditions in patients with chronic diseases (Nurbadriyah et al., 2025). Ethical principles were maintained throughout the study by providing participants with information regarding the research objectives, procedures, potential benefits and discomforts, confidentiality, and their right to refuse or withdraw from participation, followed by obtaining informed consent before data collection.

RESULTS AND DISCUSSION

Characteristics of Pulmonary Tuberculosis Patients

The study involved five patients with pulmonary tuberculosis who met the predetermined inclusion criteria at Warungasem Public Health Center, Batang. The participants consisted of two males (40%) and three females (60%), with ages ranging from 45 to 55 years. This age distribution places the participants within the late-adult to pre-elderly range, a period in which physiological reserve and immune responsiveness may become increasingly relevant to the clinical management of infectious diseases. The relatively narrow age range provides a relatively consistent demographic context for interpreting the subsequent observations of oxygen saturation. Age and gender are recognized as patient characteristics that may be associated with treatment outcomes among individuals with pulmonary tuberculosis (Febianti et al., 2022). The participant profile therefore provides an important clinical context before evaluating the physiological response to Benson relaxation therapy.

The educational characteristics showed that four participants (80%) had completed senior high school, while one participant (20%) had completed junior high school. Occupationally, two participants (40%) were housewives, while one participant each (20%) worked as a laborer, entrepreneur, and trader. These characteristics indicate that the participants had relatively similar educational attainment but diverse occupational backgrounds, which may contribute to differences in health-related experiences and daily environmental exposure. Educational attainment can influence patients' ability to understand information concerning disease management and adherence to tuberculosis treatment recommendations (Absor et al., 2020). The occupational profile is also relevant because occupational and environmental conditions may contribute to tuberculosis exposure and disease occurrence through differences in ventilation, crowding, socioeconomic circumstances, and patterns of daily activity (Renni et al., 2020). The detailed characteristics of the five participants are presented in Table 1.

Table 1. Characteristics of Pulmonary Tuberculosis Patients at Warungasem Public Health Center, Batang, 2026 (n=5)

No.	Respondent	Age (Years)	Gender	Education	Occupation
1	R1	45	Male	Senior High School	Laborer
2	R2	52	Female	Junior High School	Housewife

3	R3	48	Male	Senior High School	Entrepreneur
4	R4	55	Female	Senior High School	Housewife
5	R5	50	Female	Senior High School	Trader

As shown in Table 1, the participants were predominantly female and were concentrated within a relatively narrow age interval of 45–55 years. The presence of three female participants compared with two male participants represents the composition of this particular case series rather than evidence of a gender-specific predominance of pulmonary tuberculosis. Differences in gender and age may influence tuberculosis-related outcomes through variations in biological vulnerability, health behavior, treatment access, and adherence, although these relationships require larger samples for meaningful statistical interpretation (Sutrisna & Rahmadani, 2022). The participants' ages are clinically relevant because individuals in later adulthood may experience changes in immune function and physiological reserve that can affect their response to respiratory infections. Pulmonary tuberculosis may also coexist with prolonged symptoms and treatment-related psychological burden, making the assessment of patient condition more complex than evaluating the infectious process alone (Khoerunisa et al., 2023). The demographic profile consequently needs to be considered when interpreting physiological measurements obtained during the intervention.

The educational distribution may have facilitated the implementation of Benson relaxation therapy because most participants had attained senior high school education and were therefore expected to understand relatively simple verbal instructions concerning breathing, relaxation, and concentration. However, educational level should not be treated as a direct determinant of the intervention response because actual health literacy also depends on previous healthcare experiences, access to information, communication quality, and individual motivation. The relationship between education and tuberculosis management has been emphasized in previous research, particularly regarding patients' adherence to treatment and their ability to follow recommended healthcare practices (Absor et al., 2020). The occupational variation observed in this study similarly indicates that the participants may have experienced different daily physical demands and environmental conditions before receiving care at the health center. Such differences are relevant when describing the sample but do not provide sufficient evidence to establish occupational effects on oxygen saturation because the present study was not designed to test those relationships. The descriptive purpose of the participant characteristics is therefore to establish the clinical and sociodemographic context in which the Benson relaxation intervention was implemented.

From a clinical perspective, the characteristics of the participants suggest that the study population represented pulmonary tuberculosis patients in late adulthood with diverse social backgrounds and a predominance of moderate educational attainment. This profile is important because demographic and socioeconomic conditions can interact with treatment adherence, health behavior, and disease management, while prolonged treatment may impose additional psychological and functional demands on patients. Evidence concerning tuberculosis treatment indicates that patient characteristics should be considered when evaluating the continuity and effectiveness of care rather than treating the disease solely as an infectious process (Febianti et al., 2022). The combination of age, gender, education, and occupation described in this study establishes a baseline profile for interpreting the subsequent changes in oxygen saturation. However, the small number of participants means that these characteristics should be interpreted descriptively and should not be generalized to the wider pulmonary tuberculosis population. Their primary value lies in clarifying who received the intervention and providing contextual information for understanding the physiological observations reported in the following section. The analysis subsequently focuses on the pre-intervention and post-intervention oxygen saturation values to determine the observed changes following Benson relaxation therapy.

Oxygen Saturation Before and After Benson Relaxation Therapy

Before Benson relaxation therapy was administered, all five pulmonary tuberculosis patients had oxygen saturation values categorized as mild hypoxemia. The recorded oxygen saturation values ranged from 90% to 92%, with a mean value of 91.2%. This finding indicates that all participants entered the intervention with reduced peripheral oxygen saturation. Pulmonary tuberculosis can affect pulmonary function through pathological changes that interfere with respiratory gas exchange (Sari & Setyawati, 2022). The relatively narrow range of baseline values indicates that the participants had

comparable oxygen saturation conditions before the intervention. This baseline condition provides an important physiological reference for describing changes following Benson relaxation therapy. The pre-intervention measurements therefore establish the initial respiratory status against which the post-intervention measurements can be compared.

Following three consecutive days of Benson relaxation therapy, oxygen saturation increased in all five participants. The post-intervention values ranged from 94% to 96%, with a mean value of 95.2%. Four participants achieved the normal oxygen saturation category, while one participant remained categorized as having mild hypoxemia. The increase occurred consistently across all respondents, indicating a uniform descriptive pattern within the observed group. Previous research has reported improvements in oxygen saturation following Benson relaxation therapy among pulmonary tuberculosis patients (Ndruru et al., 2022). Another study also found increased oxygen saturation after the implementation of Benson relaxation therapy among patients with pulmonary tuberculosis (Wulandari et al., 2025). These findings indicate that the post-intervention condition showed a generally better oxygenation profile than the condition observed before therapy

Table 2. Oxygen Saturation of Pulmonary Tuberculosis Patients Before and After Benson Relaxation Therapy at Warungasem Public Health Center, Batang, 2026 (n=5)

No.	Respondent	Gender	Oxygen Saturation Before (%)	Category Before	Oxygen Saturation After (%)	Category After
1	R1	Male	91	Mild Hypoxemia	95	Normal
2	R2	Female	92	Mild Hypoxemia	96	Normal
3	R3	Male	90	Mild Hypoxemia	94	Mild Hypoxemia
4	R4	Female	91	Mild Hypoxemia	95	Normal
5	R5	Female	92	Mild Hypoxemia	96	Normal

Table 2 shows that every participant experienced an increase of four percentage points in oxygen saturation after the intervention. R1 increased from 91% to 95%, R2 from 92% to 96%, R3 from 90% to 94%, R4 from 91% to 95%, and R5 from 92% to 96%. The identical magnitude of increase indicates a consistent descriptive change across the five participants. Previous research has identified changes in oxygen saturation among pulmonary tuberculosis patients following Benson relaxation therapy (Puluhulawa et al., 2024). Breathing-based interventions have also demonstrated relevance for supporting physiological conditions among hospitalized pulmonary tuberculosis patients (Jang et al., 2022). The consistency between the present findings and previous observations provides a basis for considering Benson relaxation as a complementary approach to respiratory care. However, the observed pattern should remain descriptive because this study did not include a control group or conduct inferential statistical testing.

The increase in oxygen saturation can be considered in relation to the physiological components of Benson relaxation therapy. The technique combines relaxation, controlled breathing, and focused concentration to promote a calmer physiological state. Benson relaxation has been reported to reduce anxiety among patients with chronic health conditions (Liyanovitasari et al., 2023). Reduced psychological tension may help patients regulate their breathing more comfortably during relaxation practice. Previous research has also demonstrated the application of Benson relaxation to reduce anxiety among patients with chronic kidney disease (Nurbadriyah et al., 2025). These relaxation effects provide a possible context for understanding the improvement in oxygen saturation observed among the participants. Nevertheless, the present study did not measure respiratory rate, tidal volume, or other physiological parameters that could directly explain the mechanism underlying the observed oxygen saturation increase.

The changes in oxygen saturation categories provide additional information concerning the individual responses of the participants. Four participants changed from the mild hypoxemia category before intervention to the normal category after intervention. R3 increased from 90% to 94% but remained within the mild hypoxemia category despite experiencing the same four-percentage-point increase as the other participants. This difference indicates that an identical numerical increase may result in different clinical classifications depending on the initial oxygen saturation level. Individual

respiratory and pulmonary conditions may influence oxygenation independently of relaxation therapy (SARI & Ardillah, 2023). Previous research concerning semi-Fowler positioning has also demonstrated the relevance of non-pharmacological approaches for improving oxygen saturation among pulmonary tuberculosis patients (Yunarni et al., 2025). The findings indicate that oxygen saturation improved in every participant, although the final oxygen saturation category was not identical across respondents.

Overall, the comparison between the pre-intervention and post-intervention measurements demonstrates a consistent increase in oxygen saturation following Benson relaxation therapy. The mean oxygen saturation increased from 91.2% to 95.2%, representing an average increase of four percentage points. Every participant experienced the same four-percentage-point increase during the observation period. Benson relaxation has been described as a complementary intervention that can support relaxation-related outcomes among patients with chronic diseases (Sarmadi et al., 2023). The intervention may also contribute to improved psychological comfort by reducing anxiety among patients receiving prolonged treatment (Wahyuningsih et al., 2021). The observed increase in oxygen saturation is therefore consistent with previous findings concerning relaxation-based interventions in patients with chronic and respiratory conditions. Because the study involved only five participants and did not use a control group or inferential statistical test, the findings should be interpreted as a descriptive improvement rather than definitive evidence of a causal treatment effect.

Benefits of Benson Relaxation Therapy on Changes in Oxygen Saturation

The findings demonstrate that Benson relaxation therapy was followed by an increase in oxygen saturation among all five pulmonary tuberculosis patients. Before the intervention, the mean oxygen saturation was 91.2%, while the mean value increased to 95.2% after the intervention. The increase of four percentage points was observed consistently in every respondent, indicating a uniform descriptive pattern across the participants. Previous research has reported changes in oxygen saturation among pulmonary tuberculosis patients following Benson relaxation therapy (Ndruru et al., 2022). The improvement is relevant because reduced oxygen saturation may reflect impaired respiratory function associated with pulmonary involvement. Pulmonary tuberculosis can produce pathological changes in lung tissue that interfere with normal respiratory function (Sari & Setyawati, 2022). These findings provide an empirical basis for considering Benson relaxation therapy as a complementary intervention for supporting oxygenation in pulmonary tuberculosis patients.

Table 3 provides a more detailed comparison of oxygen saturation before and after Benson relaxation therapy. R1 increased from 91% to 95%, R2 increased from 92% to 96%, and R3 increased from 90% to 94%. R4 increased from 91% to 95%, while R5 increased from 92% to 96%. The mean oxygen saturation consequently increased from 91.2% to 95.2%, with a mean increase of four percentage points. A similar improvement in oxygen saturation has been reported among pulmonary tuberculosis patients receiving Benson relaxation therapy (Puluhulawa et al., 2024). Another study also found an increase in oxygen saturation following Benson relaxation therapy among pulmonary tuberculosis patients (Wulandari et al., 2025). The consistency of the numerical increase across all five participants indicates a positive descriptive response during the intervention period.

Table 3. Changes in Oxygen Saturation Before and After Benson Relaxation Therapy among Pulmonary Tuberculosis Patients at Warungasem Public Health Center, Batang, 2026 (n=5)

No.	Respondent	Oxygen Saturation Before (%)	Oxygen Saturation After (%)	Increase (%)
1	R1	91	95	4
2	R2	92	96	4
3	R3	90	94	4
4	R4	91	95	4
5	R5	92	96	4
	Mean	91.2	95.2	4

The potential benefit of Benson relaxation therapy can be related to the breathing and relaxation components incorporated into the technique. The practice involves controlled breathing accompanied by mental concentration, which may help patients establish a calmer and more regulated breathing

pattern. Breathing-oriented interventions have been associated with beneficial physiological responses among hospitalized pulmonary tuberculosis patients (Jang et al., 2022). Relaxation may also reduce psychological tension that can interfere with comfortable respiratory regulation. Benson relaxation has been reported to reduce anxiety among patients with chronic health conditions (Liyanovitasari et al., 2023). Reduced anxiety may support a more relaxed physiological state during respiratory activity. The observed increase in oxygen saturation is therefore compatible with the potential physiological benefits of combining relaxation and controlled breathing, although the specific mechanism was not directly measured in this study.

The improvement in oxygen saturation also needs to be interpreted alongside the psychological burden that may accompany prolonged pulmonary tuberculosis treatment. Patients undergoing extended treatment may experience anxiety related to illness duration, symptoms, treatment demands, and uncertainty regarding recovery (Khoerunisa et al., 2023). Benson relaxation has been used as a complementary nursing intervention to reduce anxiety and promote relaxation among patients with chronic disease (Wahyuningsih et al., 2021). Similar evidence indicates that Benson relaxation may provide beneficial effects on sleep and relaxation-related outcomes in patients with chronic conditions (Sarmadi et al., 2023). These psychological benefits may be relevant because emotional tension can affect breathing comfort and the patient's ability to participate calmly in respiratory exercises. The present findings consequently suggest that the potential value of Benson relaxation may involve both physiological and psychological dimensions. Nevertheless, the present study did not independently measure anxiety, respiratory rate, or other psychological and physiological variables, so these mechanisms cannot be confirmed from the observed oxygen saturation data alone.

From a clinical perspective, the changes shown in Table 4.3 indicate that all participants experienced an improvement in oxygen saturation after receiving Benson relaxation therapy. Four participants reached the normal oxygen saturation category, while R3 remained in the mild hypoxemia category despite increasing from 90% to 94%. This difference demonstrates that the same four-percentage-point improvement can produce different clinical classifications depending on the initial oxygen saturation value. Individual respiratory conditions and pulmonary involvement may contribute to differences in oxygenation among patients with pulmonary tuberculosis (SARI & Ardillah, 2023). Other non-pharmacological interventions have also been investigated to support oxygen saturation among pulmonary tuberculosis patients, including semi-Fowler positioning (Yunarni et al., 2025). Benson relaxation may therefore be positioned as a complementary supportive intervention alongside appropriate medical and nursing management. Its use should not replace pharmacological treatment or other clinical measures required to manage the underlying pulmonary disease.

The overall findings indicate that Benson relaxation therapy was associated with a consistent descriptive increase in oxygen saturation among the five pulmonary tuberculosis patients. The mean oxygen saturation increased from 91.2% before therapy to 95.2% after therapy, representing an increase of four percentage points. Every respondent demonstrated the same four-percentage-point increase, although their final oxygen saturation categories were not completely identical. Previous research has documented improvements in oxygen saturation following Benson relaxation therapy among pulmonary tuberculosis patients (Wulandari et al., 2025). Benson relaxation has also been described as a complementary technique that may provide relaxation-related benefits for patients with chronic health conditions (Ismail, 2023). The findings consequently support the potential application of Benson relaxation as a simple complementary intervention for supporting oxygenation and relaxation in pulmonary tuberculosis care. However, because the study involved only five participants and used a one-group pretest–posttest design without a control group or inferential statistical analysis, the observed improvement cannot be interpreted as definitive evidence of a causal treatment effect.

CONCLUSION

Benson relaxation therapy demonstrated a consistent descriptive improvement in oxygen saturation among pulmonary tuberculosis patients at Warungasem Public Health Center, Batang. Before the intervention, all five participants had oxygen saturation values within the mild hypoxemia category, with a mean value of 91.2%. After Benson relaxation therapy was administered for three consecutive days, the mean oxygen saturation increased to 95.2%, representing an average improvement of four percentage points. All five participants experienced the same four-percentage-point increase, although four participants reached the normal oxygen saturation category while one participant remained within

the mild hypoxemia category. The findings indicate that Benson relaxation therapy has potential as a complementary non-pharmacological nursing intervention for supporting oxygenation among pulmonary tuberculosis patients. The combination of relaxation, controlled breathing, and focused concentration may help patients achieve a calmer physiological state and support more regulated breathing during the intervention. Given its simple procedure and the consistent descriptive improvement observed in this study, Benson relaxation therapy may be considered as a supportive intervention within pulmonary tuberculosis care at primary healthcare facilities.

Benson relaxation therapy can be considered a simple, practical, and relatively easy-to-implement complementary nursing intervention that may support the management of pulmonary tuberculosis patients. Its application should remain integrated with standard medical treatment and other appropriate nursing interventions because relaxation therapy does not replace treatment directed at the underlying tuberculosis infection. The findings of this study provide preliminary empirical support for the use of Benson relaxation therapy to support oxygen saturation, particularly among patients presenting with reduced baseline oxygenation. However, the interpretation of these findings is limited by the small sample of five participants and the absence of a control group and inferential statistical testing. Future research should involve larger and more diverse samples to improve the representativeness and generalizability of the findings. Experimental or quasi-experimental designs with control or comparison groups are also recommended to provide stronger evidence regarding the effectiveness and causal contribution of Benson relaxation therapy to changes in oxygen saturation. Further studies may also incorporate additional physiological and psychological indicators to clarify the mechanisms through which Benson relaxation therapy may support respiratory status and overall patient comfort.

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