Original Article

Optimizing Drug Adherence and QoL of Pulmonary Tuberculosis Patients through Structured Health Education Based on Peer Group Support

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ABSTRACT

Background: *Patients with pulmonary tuberculosis frequently experience issues like non-compliance with treatment, boredom from prolonged therapy, and stopping treatment due to lack of recovery. This non-compliance can lead to drug resistance, therapy failure, reduced quality of life, and a higher risk of death. This study aimed to investigate the effects of Structured Health Education combined with Peer Group Support on medication adherence and quality of life among pulmonary tuberculosis patients.*

Methods: *This quantitative study employed an actual experimental research design with a pretest-posttest control group approach. The research included 38 respondents as the sample. The independent variable was Structured Health Education with Peer Group Support, while the dependent variables were Medication Compliance and Quality of Life. The research instruments used included the Morisky Medication Adherence Scale-8 (MMAS-8) to measure medication compliance and the WHOQOL-BREF to assess quality of life. The Mann-Whitney Test was applied to test the study's hypotheses.*

Results: *Structured Health Education based on peer group support is efficacious in improving patients' medication adherence and quality of life with pulmonary tuberculosis.*

Conclusion: *Nurses in the outpatient room of the health centre can apply the results of this study in providing nursing interventions and structured health education based on peer group support to improve medication adherence and the quality of life of patients with pulmonary tuberculosis.*

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Introduction

People with pulmonary tuberculosis often face various problems, including non-compliance in undergoing treatment. Many patients feel bored and even decide to stop because the treatment lasts too long and does not yield results immediately. The unsuccessful treatment can be affected by several factors, such as inadequate medication, irregular medication, and drug resistance. Disease factors include extensive lesions or the presence of other diseases, while from the patient's side, the causes can be in the form of lack of

knowledge, limited costs, and laziness or feeling cured (M. M. Putra & Sari, 2020; Nabillah *et al.*, 2022).

A low recovery rate negatively affects public health and undermines the success of treatment programs by increasing the risk of pulmonary tuberculosis transmission within families and the broader community. Non-compliance with medication regimens can lead to drug resistance, which may result in treatment failure. Discontinuation of therapy lowers the patient's quality of life and heightens the risk of mortality (Abiz *et al.*, 2020; Putri *et al.*, 2023).

In 2022, WHO data shows that the highest cases of pulmonary tuberculosis occur in Southeast Asia, followed by Africa (23%) and the Western Pacific (18%). In the Republic of Ghana, Africa, the level of non-adherence to medication in tuberculosis patients is very high, with an adherence rate of less than 90% of the total sufferers, namely 92 cases per 100,000 population (Appiah *et al.*, 2023). In 2023, the number of pulmonary tuberculosis cases in Indonesia will reach 809,000. This figure is significantly higher compared to pre-pandemic cases, which were found to average less than 600,000 per year (Kemenkes RI, 2023). Target nasional untuk angka keberhasilan pengobatan tuberkulosis paru ditetapkan sebesar 90,0%. However, many provinces in Indonesia have not achieved the targeted success rates for pulmonary tuberculosis treatment. Research (Amalia *et al.*, 2022; Fitri *et al.*, 2020; Muflihatin *et al.*, 2020; Pasaribu *et al.*, 2023) Reveals that almost 50% of people with pulmonary tuberculosis do not adhere to pre-programmed treatment. Research Results (Maknunah, 2022) showed that the level of medication adherence in people with pulmonary tuberculosis varied, with 30% of respondents having low adherence, 35% adequate, and only 25% showing good adherence. This indicates that medication adherence is still a problem that needs to be overcome. In addition, the quality of life of pulmonary tuberculosis patients is also a serious issue that requires more attention. Riset (Alfauzan & Lucya, 2021; Hidayati *et al.*, 2023; Noranisa *et al.*, 2023; O. N. Putra *et al.*, 2022) mentioned almost 50% of people with poor lung tuberculosis. Research results (Agustina *et al.*, 2024) said that 42.3% of the quality of life in patients with pulmonary tuberculosis was not good.

The success of pulmonary tuberculosis treatment is influenced by several factors, such as the transfer of patients to other health facilities without information about previous treatment results, drug-resistant tuberculosis cases, and patient compliance in taking anti-tuberculosis drugs (Kemenkes RI, 2023). Adherence to pulmonary tuberculosis medication is essential, as irregularities in treatment can lead to germ resistance to anti-tuberculosis drugs (OAT), known as Multidrug resistance (MDR). This non-compliance increases the risk of treatment failure, worsens quality of life, increases morbidity and mortality, and triggers more cases of tuberculosis with acid-resistant bacilli (BTA). Patients with this resistance also have the potential to be a source of transmission of resistant germs in the community (Rasdianah *et al.*, 2024).

Medication adherence is a key factor in the control and success of pulmonary tuberculosis treatment. Some of the factors that influence it include motivation to recover, lifestyle changes, perception of disease severity, assessment of risk, difficulty understanding and implementing certain behaviours, disease severity, belief in the effectiveness of therapy, the complexity of treatment, side effects, cultural influences, and satisfaction and relationships with healthcare providers (Maknunah, 2022; Dilas *et al.*, 2023).

Adherence is essential in healthy living behaviours, mainly since the success of pulmonary tuberculosis treatment depends highly on patient adherence. Disease prevention is needed to avoid worse conditions and complications, one of which is by maintaining regular medication taking. This regularity plays a significant role in the success of therapy. Treatment of pulmonary tuberculosis affects physical, psychosocial, social, and environmental health, an essential aspect of quality of life. Therefore, anti-tuberculosis treatment can significantly affect the quality of life, both physical and psychosocial, so it is necessary to measure the patient's quality of life (Tornu & Quarcoopome, 2022).

Although effective tuberculosis treatment is available, the cure rate is still not optimal. The leading cause is the patient's non-compliance with the rules and duration of therapy, often caused by a lack of knowledge. Nursing interventions such as health education, DOTS strategies, and family support are needed to improve compliance. Factors supporting compliance include good health education, family and social support, health support systems, access to medications, management of side effects, medication education, monitoring of health services, and patient motivation and confidence **(**Sukartini *et al.*, **2020).**

To enhance medication adherence and quality of life, this study implements structured health education using a Peer Group Support-based approach. This approach connects patients with shared experiences, fostering emotional and social support and promoting better adherence to treatment and an improved quality of life for individuals with pulmonary tuberculosis (M. M. Putra & Sari, 2020). This is supported by research (Kurniasih *et al.*, 2020; Muhtar *et al.*, 2019; Tumurang, 2023; Widiantoro, 2022), which states that health education can improve patient treatment program adherence. Research also supports it(Dilas *et al.*, 2023; Hasanah *et al.*, 2019; Ni'mah *et al.*, 2018). With the Peer Group Support approach, a person with pulmonary tuberculosis can increase medication adherence. In addition, research (A. T. Afandi, 2021) has stated that health education combined with Peer Group Support can enhance treatment adherence and quality of life in patients with pulmonary tuberculosis and other chronic diseases. Key driving factors include mutual support and encouragement within peer groups among individuals with pulmonary tuberculosis. This support is essential for treatment success, as it provides emotional support, such as reminding each other to take medication regularly. Given the length of treatment for pulmonary tuberculosis, high adherence and motivation are necessary. Therefore, structured health education based on peer group support must be implemented to maintain patients' intentions in following treatment and improve their quality of life (Notoatmodjo, 2014).

Methods

Study Design

This study employed a quantitative approach using an experimental research design with a pretest-posttest control group framework.

Sample/Participants

The population of this study consisted of 50 pulmonary tuberculosis patients within the Working Area of the Seget Health Center, Seget District, Sorong Regency. Sampling was conducted using a purposive sampling technique, with respondents selected based on the following inclusion criteria: cooperative patients, pulmonary tuberculosis patients undergoing treatment, Glasgow Coma Scale of E4 V5 M6, adult age, low medication adherence, and a

poor to adequate quality of life as measured by standardized instruments. The final research sample comprised 38 respondents.

Instrument

The independent variable in this study is Structured Health Education incorporating Peer Group Support, while the dependent variables are Medication Compliance and Quality of Life. The research utilized the Morisky Medication Adherence Scale-8 (MMAS-8) to measure medication compliance and the WHOQOL-BREF instrument to assess quality of life.

Intervention

Structured Health Education based on peer group support is an educational approach systematically designed to increase individual knowledge, skills, and health awareness by utilizing peer group support. In this program, health education is delivered through an organized and planned method while engaging individuals with similar experiences or health conditions to provide emotional, social, and practical support to each other, in this case, pulmonary tuberculosis patients—structured Health based on Peer group support as many as 9 meetings for 1 month.

Data Collection

The research was conducted after passing the Ethics review by the Research Ethics Committee of STRADA Indonesia University in September-October 2024 in the Seget Health Center Working Area, Seget District, Sorong Regency. The researcher discussed selecting clients according to the inclusion criteria with the nurse. After that, the researcher met with the client to introduce himself and explain the procedures and benefits of providing Structured Health Education based on Peer Group Support. Patients who have been described and are willing to participate in the study will sign an Informed Consent. Respondents were given structured health education based on peer group support, and 9 meetings were conducted for 1 month, each meeting lasting 40 minutes. Each respondent was measured for Drug Medication Compliance and Quality of Life before and after the intervention was given.

Data Analysis

The Mann-Whitney Test was used to answer the hypothesis in this study.

Ethical consideration

Research ethics principles: informed, anonymity, confidentiality, beneficence, non-maleficence, veracity, and justice have passed the ethical review of the KEPK STRADA Indonesia University with number 615/EC/KEPK/I/09/2024.

Results

Table 1 Data on the distribution of age, gender, education, and occupation of respondents, length of medication

Characteristic Data	Intervention		Control		Homogeneity Test
	n=19	%	n=19	%	
Age					
18-35 years old	11	57,9	12	63,2	
36-50 years old	8	36,8	5	26,3	0,701
> 50 years	1	5,3	2	10,5	
Total	19	100	19	100	
Gender					
Man	12	63,2	11	57,9	
Woman	7	36,8	8	42,1	1,000
Total	19	100	19	100	
Education					
Primary school	5	26,3	6	31,6	
Junior High School	6	31,6	4	21,1	
Senior High School	8	42,1	9	47,4	0,760
College	-	-	-	-	
Total	19	100	19	100	
Work					
Working	8	42,1	7	36,8	
Not working	11	57,9	12	63,2	1,000
Total	19	100	19	100	
Length of Taking Medication					
≤ 2 months	6	31,6	8	42,1	
> 2 months	13	68,4	11	57,9	0,737
Total	19	100	19	100	

Based on Table 1, the homogeneity test for the characteristics of age, gender, education, and occupation revealed P values above 0.05, indicating no significant differences between the intervention and control groups. In the intervention group, most respondents (57.9%) were aged between 18-35 years, while in the control group, the majority (63.2%) also fell within this age range. Regarding gender, 63.2% of respondents in the intervention group were male, and in the control group, 57.9% were also male. Educationally, nearly half of the respondents in the intervention group (42.1%) and the control group (47.4%) had completed Senior High School. In the intervention group, most (57.9%) respondents did not work; in the control group, most (63.2%) did not. The intervention group took medication for the most part (68.4%) > 2 months, and the control group took the drug for most (57.9%) > 2 months.

Table 2 Distribution of unique data analysis of medication adherence in patients with pulmonary tuberculosis before and after being given Structured Health Education based on Peer group support in the intervention and control groups

Medication Compliance	Group		p-value	Information
	Intervention (n=19)	Control (n=19)		
Medication Compliance (Pre)				
Compliance	2 (10,5%)	3 (15,8%)	0,610	Insignificant
Non-Compliance	17 (89,5%)	16 (84,2%)		
Medication Compliance (Post)				
Compliance	19 (100%)	4 (21,1%)	0,000	Significant
Non-Compliance	0 (0%)	5 (78,9%)		

Table 2 shows a p-value of 0.000 regarding medication adherence among pulmonary tuberculosis patients between the intervention and control groups after receiving "Peer Group Support-based Structured Health Education." This indicates a significant difference in medication adherence between the two groups following the intervention. After receiving the Peer Group Support-based Structured Health Education, 100% of the patients in the intervention group demonstrated full compliance with their medication regimen.

Table 3 Distribution of data analysis for the quality of life of Pulmonary Tuberculosis Patients before and after being given Structured Health Education based on *Peer group support* in the intervention and control groups

Quality of Life	Group		p-value	Information
	Intervention (n=19)	Control (n=19)		
Quality of Life (Pre)				
Less	12(63,2%)	10 (52,6%)	0,953	Insignificant
Enough	7 (36,8%)	9 (47,4%)		
Good	0 (0%)	0 (0%)		
Quality of Life (Post)				
Less	0 (0%)	9 (47,4%)	0,000	Significant
Enough	2 (10,5%)	10 (52,6%)		
Good	17 (89,5%)	0 (0%)		

Table 3 shows a p-value of < 0.000 regarding the quality of life of pulmonary tuberculosis patients between the intervention and control groups after receiving "Peer Group Support-based Structured Health Education." This indicates a significant difference in the quality of life between the two groups following the intervention. After receiving Peer Group Support-based Structured Health Education, 89.5% of the patients in the intervention group reported a good quality of life.

Table 4 Analysis Table of Data Changes/Delta of Drug Adherence and Quality of Life of Pulmonary Tuberculosis Patients Before and After Peer Group Support Based on Structured Health Education in the Intervention and Control Groups

Variable	Group		p-value	Information
	Intervention (n=19)	Control (n=19)		
Medication Compliance				
Mean ± SD	4,53 ± 1,64	0,16 ± 0,37	0,000	Significant
Quality of Life				
Mean ± SD	31,45 ± 7,74	2,67 ± 7,73	0,000	Significant

Based on Table 4, a delta p-value of 0.000 was obtained regarding medication adherence and quality of life of pulmonary tuberculosis patients between the intervention group and the control group after receiving "Peer Group Support-based Structured Health Education." This shows a significant improvement in medication adherence and quality of life for patients in the intervention group. This indicates that Structured Health Education based on peer group support effectively enhances medication adherence and quality of life in patients with pulmonary tuberculosis.

Discussion

Based on Table 2, a p-value of 0.000 was obtained regarding medication adherence of pulmonary tuberculosis patients between the intervention group and the control group after receiving "Peer Group Support-based Structured Health Education." This indicates a significant difference in medication adherence between the intervention and control groups after the treatment. After receiving the Peer-based Structured Health Education support, 100% of the pulmonary tuberculosis patients in the intervention group were fully compliant with their medication regimen. The above aligns with (Widiantoro, 2022; Adenan, 2024). It has been demonstrated that structured health education can enhance medication adherence among patients with pulmonary tuberculosis. In addition, research (Hasanah *et al.*, 2019; Haryanto & Sugiyarto, 2023) stated that the peer group support approach can improve medication adherence in pulmonary tuberculosis patients.

Pulmonary tuberculosis is an infectious disease caused by Mycobacterium tuberculosis, which attacks the lungs and spreads through droplets in the air. Treatment of pulmonary tuberculosis requires long-term adherence to treatment, usually for 6-9 months, with a combination of anti-tuberculosis drugs, including isoniazid, rifampicin, pyrazinamide, and ethambutol. Medication adherence is an essential factor in the success of TB therapy, as non-adherence can lead to drug resistance, prolongation of treatment duration, and increased risk of transmission (Putri *et al.*, 2023). Health education is an essential strategy for improving patient treatment adherence. Structured health education systematically provides clear and precise information about diseases, therapies, and the consequences of non-compliance in treatment. Through this approach, patients are expected to understand their disease better and be motivated to adhere to the treatment

schedule (Dilas *et al.*, 2023). The purpose of Structured Health Education is to provide accurate information about tuberculosis, treatment, and drug side effects; help patients understand the importance of complete treatment and build a positive attitude towards treatment; teach patients how to manage their daily medications, including how to deal with drug side effects; Patients who receive structured health education have higher adherence to medication because they better understand the importance of delivering therapy in a timely and correct manner (Widiantoro, 2022).

The peer group support approach is an approach that utilizes interactions between patients who have similar experiences to provide emotional, social, and informational support to each other (Hasanah *et al.*, 2019). In the context of pulmonary tu, Peer group support offers a space for patients to share experiences related to diagnosis, treatment, drug side effects, and challenges in maintaining treatment adherence. Benefits of Peer Group Support: there is support from other patients; when patients see successes or challenges faced by others in the group, they become more motivated to adhere to their medications. Being supportive reduces tuberculosis-related stigma, and patients are more comfortable undergoing therapy (Haryanto & Sugiyarto, 2023). The Peer Group Support Implementation Model is that peer groups meet regularly to discuss treatment progress and daily experiences and provide moral support to each other. Sometimes, a health worker or counsellor may facilitate a discussion to ensure the information provided is correct and appropriate. Former patients with pulmonary tuberculosis who have recovered and are compliant in treatment are often involved as motivators, as they have relevant personal experiences and can provide first-hand insights into the importance of compliance (Nabillah *et al.*, 2022).

Medication adherence is a complex matter involving physical, psychological, social, and environmental aspects. Peer group support-based health education is vital in improving adherence with several mechanisms. Through interaction with peers, tuberculosis patients get additional information that helps clarify their understanding of the disease and the importance of completing treatment. Pulmonary tuberculosis is often associated with social stigma that can result in feelings of shame and isolation (Potty *et al.*, 2023). Peer group support helps patients feel not alone in their struggles, increases self-confidence, and reduces anxiety. In peer groups, there is a tendency for patients to feel socially responsible to other members, so they are motivated to be obedient to treatment because of social urges and a desire to be part of a group that successfully undergoes therapy (A. Afandi *et al.*, 2020). One of the main reasons for non-compliance is the side effects of tuberculosis drugs. In peer groups, patients can share experiences of coping with these side effects, providing solutions that may not be available in formal medical consultations (Ni'mah *et al.*, 2018).

Several studies have shown the effectiveness of the Peer group support approach in improving treatment adherence of pulmonary tuberculosis patients namely (Suarnianti *et al.*, 2021) found that tuberculosis patients who were involved in the Peer group support program had higher levels of medication adherence than patients who did not participate in the program. A study in Indonesia involved a peer group support approach facilitated by former tuberculosis patients. The research results (Hasanah *et al.*, 2019) showed that patients who attended routine group meetings had 85% medication adherence

compared to 60% in the group that did not participate in the program. Structured health based on peer group support has been proven effective in improving medication adherence in pulmonary tuberculosis patients. Peer group support provides social support, motivation, and additional knowledge, allowing patients to overcome the challenges of undergoing tuberculosis treatment. Combining structured health education with peer group support is a holistic strategy and has the potential to improve therapeutic outcomes and reduce drug resistance and relapse. For better implementation, there needs to be an integration between the Peer group support program and primary health services and training for group facilitators to provide practical guidance for pulmonary tuberculosis patients.

Table 3 shows a p-value of < 0.000 regarding the quality of life of pulmonary tuberculosis patients between the intervention and control groups following the 'Peer Group Support-based Structured Health Education' treatment. This indicates a significant difference in the quality of life between the two groups after the intervention. Following the administration of Peer Group-based Structured Health Education, 89.5% of patients in the intervention group improved their quality of life. The above aligns with research (Muntiana *et al.*, 2019; Condeng, 2023), which states that structured health education can improve the quality of life. In addition, research (Roshandel *et al.*, 2021; Afandi, 2021)noted that the Peer group support approach enhances the quality of life of pulmonary tuberculosis patients.

Pulmonary tuberculosis is an infectious infectious disease that is still a public health problem in many countries, especially in developing countries. Although pharmacological therapy is a significant component in the management of pulmonary tuberculosis, the quality of life of patients often depends not only on clinical aspects or medical treatment but also on social support, education, and other non-pharmacological strategies. One of the approaches that is starting to be widely used is structured health education based on *peer group support*. This approach can help patients overcome stigma and improve overall quality of life (A. T. Afandi, 2021). Structured health education refers to systematic interventions to provide health information tailored to the needs of an individual or group. In the context of pulmonary tuberculosis, health education can include understanding the disease, the importance of adherence to treatment, drug side effects, prevention of transmission, and increasing awareness about nutrition and healthy lifestyles (Demeke *et al.*, 2024). *Peer group support* is a form of social support in which individuals who experience similar conditions (in this case, people with Tuberculosis) share experiences, challenges, and solutions. This can reduce the social isolation that people with tuberculosis often experience, mainly because of the stigma associated with the disease. In a peer group, sufferers can feel that they are not the only ones experiencing these challenges, thus helping to reduce anxiety and increase optimism (Roshandel *et al.*, 2021).

The quality of life of people with pulmonary tuberculosis is affected by several aspects, namely tuberculosis symptoms, such as prolonged cough, shortness of breath, and fatigue, which can interfere with daily activities. Structured health education can help patients better manage treatment symptoms and side effects (Poulsen *et al.*, 2022). Peer group support can also provide practical tips from other patients who have gone through the same stage of treatment. Social stigma and anxiety often accompany the diagnosis of

pulmonary tuberculosis. Many patients feel isolated or depressed as a result of their illness. In this case, support from peer groups can provide a safe space to talk about their feelings and experiences, thus helping to reduce mental distress; social interaction of people with tuberculosis is often reduced due to fear of transmission or community stigma. Through peer group support, sufferers can rebuild confidence to interact with others, reduce feelings of isolation, and increase social engagement (Ritchie & Horton, 2023).

Studies (Doull *et al.*, 2017) show that peer support group-based interventions and health education positively impact the quality of life of people with chronic diseases, including tuberculosis. Health education provided in a structured and continuous manner through peer group support improves patients' understanding of tuberculosis and its management. So, with this increased understanding, there is an increase in medication adherence and patients' ability to cope with medication side effects, which ultimately improves their quality of life.

According to Table 4, a delta p-value of 0.000 was obtained concerning medication adherence and the quality of life of pulmonary tuberculosis patients between the intervention and control groups after the 'Peer Group Support-based Structured Health Education' treatment. This indicates a significant improvement in medication adherence and quality of life among patients in the intervention group. These results suggest that peer group support-based structured health education effectively enhances medication adherence and quality of life in pulmonary tuberculosis patients. Pulmonary tuberculosis is one of the deadliest and most contagious infectious diseases globally. Although pulmonary tuberculosis treatment is available and effective, adherence to an extended treatment regimen is often a significant concern (A. Afandi *et al.*, 2020). Tuberculosis therapy requires taking antituberculosis drugs (OAT) for an extended period, usually 6-12 months. Non-adherence to medication can lead to therapy failure, drug resistance, and increased mortality (Suarnianti *et al.*, 2021).

In addition to the challenges of medication adherence, people with pulmonary tuberculosis often experience a decline in quality of life due to physical impacts (such as fatigue and chronic cough), social stigma, and psychological problems such as anxiety and depression. Therefore, a comprehensive intervention strategy is needed to improve medication adherence and patients' quality of life. Structured health education is a systematic approach to providing patients with accurate and relevant information related to diseases and treatments. Peer group support is support provided by people who have similar experiences in dealing with pulmonary tuberculosis. It is essential to increase patients' motivation to adhere to medication through positive social and emotional interactions (Ritchie & Horton, 2023).

Medication adherence is essential in the treatment of pulmonary tuberculosis. Studies show that a combination of health education and peer group support is vital to improving this adherence. Health education gives patients the knowledge they need to understand the risks of non-compliance, while peer group support creates a supportive environment to reinforce each other and maintain discipline (Roshandel *et al.*, 2021). Patients who received social support and continuing education were more likely to complete treatment and face challenges related to medication side effects. Proper education allows patients to recognize the importance of each dose of medication in preventing multidrug-

resistant tuberculosis (MDR-TB) resistance (Condeng, 2023). The quality of life of people with pulmonary tuberculosis depends on physical improvement through treatment and psychological and social well-being. Structured health education and peer support help address several factors that affect quality of life, including increased adherence to medication, which leads to improved physical condition of patients, including a reduction in symptoms such as cough, fever, and fatigue. With faster recovery, the physical quality of life also improves. Peer group interactions help patients feel more accepted, reducing anxiety, depression, and stress that often arise due to stigma or misconceptions related to tuberculosis. Peer group support helps patients reconnect with the community and build confidence in socializing, vital in their social recovery. Groups can also serve as a means for broader community education, which can reduce stigma in society. Structured health education programs involving *peer group support* have been proven to improve medication adherence and reduce drug withdrawal rates in pulmonary tuberculosis patients. The results of these interventions contribute to an increase in the recovery rate of patients as well as an improvement in their quality of life (Condeng, 2023).

According to the researchers, structured health education based on *peer group support* effectively improves **medication adherence** and the **quality of life** of people with pulmonary tuberculosis. Through ongoing education, patients better understand the importance of treatment and how to cope with side effects. Meanwhile, peer support helps overcome stigma and isolation, provides ongoing motivation, and supports emotional well-being. Combining these two approaches has been scientifically proven to contribute to better treatment outcomes and improved quality of life for pulmonary tuberculosis patients.

Conclusion

In conclusion, the combination of structured health education based on peer group support has proven to significantly improve both medication adherence and the quality of life in patients with pulmonary tuberculosis. This intervention addresses multiple dimensions of patient care by enhancing understanding of treatment, providing emotional and social support, and reducing stigma associated with the disease. The results suggest that peer group support not only motivates patients to adhere to their medication regimens but also helps them cope with the psychological and social challenges of tuberculosis. Future research should explore the long-term effects of this intervention, optimize the peer group support model, and investigate its applicability in different cultural and socioeconomic settings. Additionally, integrating peer group support into regular healthcare practices could further enhance its effectiveness in managing tuberculosis and improving patient outcomes.

Authors Contributions

The authors played a pivotal role in designing and executing the study, analyzing the data, and interpreting the outcomes.

Conflicts of Interest

In this research, there is no conflict of interest.

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