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Case Study: Implementation of Video-Based Education to Improve Medication Adherence in Child L with Tuberculosis in Panumbangan

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ABSTRACT

Introduction: Tuberculosis (TB) is a contagious infectious disease that remains a global health problem, especially in developing countries like Indonesia. Adherence to TB treatment is crucial for therapeutic success, particularly in children who often face challenges in taking medication regularly. One effort to improve adherence is through education using audiovisual media.
Objective: To determine the effect of video-based education on medication adherence in children diagnosed with pulmonary tuberculosis.
Method: This study used a descriptive case study approach involving one school-aged child with pulmonary TB who exhibited non-adherence. The intervention consisted of video education accessed via YouTube for three consecutive days. Data collection methods included interviews, observation, physical examination, and nursing documentation.
Result: After three days of video education intervention, the child's adherence improved. Initially, the child resisted medication and frequently became upset, but after watching the educational video with their parents, the child began to take the medication willingly.
Conclusion: Video-based education is effective in improving medication adherence in children with TB. Educational videos can serve as an engaging and accessible alternative for health promotion, easily accepted by both children and their families.

Keywords: pediatric tuberculosis, video education, medication adherence, nursing

Introduction

Tuberculosis is a contagious infectious disease caused by the Gram-positive bacterium Mycobacterium tuberculosis, an obligate aerobic organism that primarily affects the human lungs. Transmission occurs through droplet nuclei released into the air when a person with smear-positive pulmonary TB coughs or sneezes (Mar'iyah & Zulkarnain, 2021). When a person with tuberculosis coughs, saliva droplets containing the bacteria are expelled into the air and may be inhaled by healthy individuals. Once inside the body, Mycobacterium tuberculosis infects the lungs and initiates the disease process. This bacterium is aerobic,

meaning it requires oxygen to grow and reproduce, which is why it tends to proliferate in organs with high oxygen pressure, such as the lungs. Due to its ability to multiply rapidly in the lungs, treatment becomes a critical factor in determining the patient's quality of life. For patients without drug resistance, tuberculosis treatment typically lasts between 6 to 12 months (Juliana et al., 2024).

According to data from the World Health Organization (WHO), tuberculosis (TB) ranks as the 13th leading cause of death worldwide and is the second deadliest infectious disease after COVID-19. In 2021, the Southeast Asia region recorded the highest number of new TB cases, accounting for 45% of the global total. This was followed by the African region with 23%, and the Western Pacific region with 18%. The Eastern Mediterranean region reported 8.1% of new cases, while the Americas accounted for 2.9%, and Europe 2.2%.(Adhanty & Syarif, 2023). Indonesia contributes approximately 8.5% of the total global tuberculosis (TB) cases, based on an estimated 10 million cases worldwide. With around 850,000 reported cases, Indonesia ranks as the country with the second-highest number of TB patients, following India (Pralambang & Setiawan, 2021). Among age groups, children aged 0–14 years represent the second largest proportion of TB cases, following the 45–54 year group (16.5%), with 15.3% of cases, equivalent to 103,652 individuals (Kurniawati et al., 2025).

Anti-tuberculosis drugs (OAT) are the cornerstone of TB treatment, with proper medication being one of the most effective ways to halt the spread of the disease-causing bacteria. To ensure optimal treatment outcomes, several key principles must be met: therapy should involve a combination of at least four types of OAT to prevent drug resistance; the dosage must be accurate and in accordance with established standards; medications must be taken regularly under the direct supervision of a Treatment Supervisor (PMO); and the treatment must be carried out for an adequate duration, encompassing both the intensive and continuation phases, to prevent relapse(Uljannah, 2022).

Pulmonary tuberculosis (TB) treatment consists of two main phases: the intensive phase and the continuation phase, each with specific goals and durations. During the intensive phase, therapy is administered daily for two months with the aim of significantly reducing the bacterial load in the body and addressing any pre-existing drug-resistant strains. When the treatment is followed diligently and without complications, TB transmission rates typically drop substantially within the first two weeks. This is followed by the continuation phase, which is carried out daily for an additional four months. Its purpose is to eliminate any remaining bacteria, particularly persistent bacilli, ensuring full recovery and preventing relapse. Failure to complete the treatment regimen poses a serious risk of developing resistance to anti-tuberculosis drugs. Therefore, patient adherence to regular medication intake is a critical factor in determining the success of therapy in pulmonary TB cases (Pasaribu et al., 2023).

Adherence is a crucial aspect of the tuberculosis treatment process, as the success of therapy heavily depends on the patient's ability to follow the prescribed regimen consistently and regularly. A patient's level of adherence is influenced by individual behaviors, including awareness, motivation, and commitment to complying with medical recommendations. (Nabila, 2023). The factors hindering the success of tuberculosis treatment include limited education for patients and their families, negative stigma within the community, economic

difficulties due to loss of income, insufficient family support, the relatively long duration of therapy, and the potential side effects of medication(Daniati & Romalina, 2025).

Education is a deliberate effort designed by an individual to influence others—whether individually, in groups, or within a community. The primary goal of this educational process is to promote positive change and improvement in people's lives (Sarumaha et al., 2022). Educational video is an audiovisual medium specifically designed to convey information, concepts, or particular skills with the aim of enhancing the viewer's knowledge and cognitive abilities. As a supporting tool in the teaching and learning process, educational videos offer numerous benefits, including contributing to the improvement of human resource quality (Weni et al., 2025).

In the nursing diagnosis of non-compliance, the author includes a nursing care plan that involves the use of educational video interventions to improve medication adherence in a pediatric TB patient (An.L). The intervention utilizes a YouTube video titled "Video Edukasi TBC pada Anak" uploaded by the account named Direktorat Pelayanan Kesehatan Keluarga. This educational video is intended to enhance the patient's understanding and motivation, thereby increasing adherence to tuberculosis treatment.

إن الله تعالى أَنْزَلَ الدَّاءَ وَالدَّوَاءَ وَجَعَلَ لِكُلِّ دَاءٍ دَوَاءً فتداووا ولا تداووا بالحرام

The meaning is: "Indeed, Allah has sent down both the disease and its cure, and He has made for every disease a remedy. So seek treatment, but do not seek treatment with that which is unlawful (haram)." (HR. Abu Dawud dari Abu Darda).

The conclusion of the hadith narrated by Abu Dawud emphasizes that every illness has a cure, and seeking treatment is a recommended form of effort, as long as it does not involve anything unlawful (haram). In the context of pediatric nursing care for children with tuberculosis, adherence to medication represents an act of obedience and patience in facing the trial of illness. These values align closely with the role of nurses in supporting and accompanying patients to remain consistent and committed throughout the treatment process.

Objective

To determine the effect of video-based education on medication adherence in children with tuberculosis.

Method

Design and setting

The research design used in this study is a case study with a descriptive approach. The descriptive method aims to illustrate the outcomes of nursing care, focusing on one of the main problems identified in the selected case. This approach is complemented by a simple analysis to provide answers to the research question that has been formulated (Zakariah et al., 2020). The approach applied is a nursing care approach that encompasses the entire process, starting from the collection of assessment data, establishment of nursing diagnoses,

planning of interventions, implementation of nursing actions, and concluding with the evaluation stage for a school-aged pediatric client. However, the intervention and evaluation were limited to three days, compared to the six-month duration of the treatment.

The research design in this scientific work employs a descriptive approach using a single case study method. Subject selection was based on inclusion criteria, namely: a school-aged child diagnosed with pulmonary tuberculosis, in stable general condition (compos mentis), able to communicate verbally, currently undergoing anti-tuberculosis drug (OAT) therapy, and whose parents consented to participate in the study. The exclusion criteria included children in critical or emergency conditions, those who had recently undergone major surgery or experienced acute complications, as well as children or parents who refused to participate in the study.

This case study on the implementation of video-based education to improve medication adherence in a child with tuberculosis and a nursing diagnosis of non-compliance was conducted in Panumbangan, using an educational video available on YouTube titled “Video Edukasi TBC Pada Anak” from the account (Direktorat Pelayanan Kesehatan Keluarga). The study was carried out over a three-day period, including activities such as assessment, physical examination, observation of vital signs, monitoring of medication adherence, and evaluation, which showed that the child was willing to take the medication without coercion. However, given the limitation that the study was conducted over only three days, the researcher cannot guarantee that adherence will remain consistent throughout the six-month treatment period.

Population and sampling

This study involved a single subject, a 9-year-old school-aged child diagnosed with pulmonary tuberculosis who exhibited non-adherence to medication. The subject was selected based on inclusion criteria: stable general condition, ability to communicate verbally, undergoing TB treatment, and parental consent to participate. Exclusion criteria included critically ill children, those with acute complications, or refusal to participate.

Instrument and measurement

The instruments used were interview guidelines, observation sheets, physical examination, and nursing documentation. Measurements included vital signs, medication adherence, and behavioral responses during the intervention.

Data collection and analysis

Data were collected through interviews, observation, physical examination, and nursing documentation during three days of intervention. The data were analyzed descriptively, focusing on behavioral changes in medication adherence after the video-based educational intervention.

Result

The assessment was conducted on June 7, 2025. Data were collected through interviews, physical examinations, and observations. The client, referred to as An. L, is a 9-year-old male

child weighing 26 kg, currently in the third month of tuberculosis treatment. He resides in Panumbangan, Ciamis Regency. An. L is a third-grade elementary school student. His father works as a laborer, while his mother is a homemaker. The client lives at home with both of his parents.

During the assessment, the client's mother stated that the child had recently been resistant to taking his medication, often becoming irritable and angry, complaining that the medicine tasted bitter and that he was tired of taking it every day. Upon further investigation, it was found that the medication, which was supposed to run out by June 15, 2025 (based on monthly dosing), actually lasted until June 16, 2025-indicating a one-day delay in adherence. The client's vital signs at the time of assessment were as follows: blood pressure 105/65 mmHg, body temperature 36.2°C, respiratory rate 22 breaths per minute, pulse rate 100 beats per minute, and oxygen saturation (SpO_2) at 99%.

Diagnosis

The nursing diagnosis identified in this client is Non-compliance (D.0114). This diagnosis was established based on the assessment conducted by the author, during which the client's mother reported that the child frequently had difficulty taking tuberculosis medication as prescribed. This behavioral pattern indicates a lack of adherence to the treatment regimen, which forms the basis for the diagnosis.

Table 2. Data Analysis

Symptom	Etiologi	Problem
Subjective Data: The client's mother stated that the child often has difficulty taking the medication, sometimes becoming angry, complaining that the medicine is bitter and that he is tired of taking it every day. **Objective Data:** Blood pressure: 105/65 mmHg Pulse: 100 beats per minute Respiratory rate: 22 breaths per minute Temperature: 36.2°C SpO_2: 99% Medication was missed for 1 day within a 1-month treatment period.	A complex and/or long-term treatment program	Non-compliance

Intervention, Implementation, and Evaluation

Table 1.Nursing Intervention

Outcome	Intervention
After implementing nursing interventions for 3	**Adherence Support for Treatment Program (I.12361)** **Observation:**

consecutive days (3 x 24 hours), the client's level of adherence showed improvement (**L.12110**), with the following outcome criteria: 1. Increased verbalization of willingness to comply with the treatment or care program 2. Improved verbalization of following health recommendations 3. Improved behavior in following the treatment/care regimen 4. Improved behavior in carrying out health-related instructions	1. Identify the patient's adherence to the prescribed treatment program. **Therapeutic:** 1. Encourage the patient to make a strong commitment to completing the treatment program properly. 2. Document activities undertaken throughout the treatment process. 3. Discuss factors that may support or hinder the continuation of the treatment program. 4. Involve the family in providing support for the ongoing treatment process. **Education:** 1. Provide clear information about the treatment program that must be followed. 2. Explain the benefits of consistently adhering to the treatment plan. 3. Encourage family members to accompany and care for the patient during the treatment. 4. Recommend that the patient and family consult nearby healthcare services when necessary. 5. Recommended the child and parents to watch an educational video on YouTube titled "Video Edukasi TBC Pada Anak", uploaded by the account Direktorat Pelayanan Kesehatan Keluarga Link: https://www.youtube.com/watch?v=41LzxgyaGoo

Table 2. Nursing Implementation

Nursing Implementation		
07 June 2025	**08 June 2025**	**09 June 2025**
1. Conducted assessment and physical examination. 2. Monitored vital signs. Results: blood pressure 105/65 mmHg, pulse 100 beats per minute, respiratory rate 22 breaths per minute, temperature 36.2ºC. 3. Identified the patient's adherence to the prescribed treatment program. 4. Recommended the child and parents to watch an educational video on	1. Recommended the child and parents to watch an educational video on YouTube titled "Video Edukasi TBC Pada Anak", uploaded by the account Direktorat Pelayanan Kesehatan Keluarga. Link: https://www.youtube.com/watch?v=41LzxgyaGoo	1. Recommended the child and parents to watch an educational video on YouTube titled "Video Edukasi TBC Pada Anak", uploaded by the account Direktorat Pelayanan Kesehatan Keluarga. Link: https://www.youtube.com/watch?v=41LzxgyaGoo

	YouTube titled "Video Edukasi TBC Pada Anak", uploaded by the account Direktorat Pelayanan Kesehatan Keluarga. Link: https://www.youtube.com/watch?v=41LzxgyaGoo

Table 3. Nursing Evaluation

Nursing Evaluation		
08 June 2025	**09 June 2025**	**10 June 2025**
S: The client's mother stated that the child is no longer having difficulty taking the medication and does not get angry when asked to take it. O: The client and her parents have watched the recommended educational video. A: Non-compliance has not yet been fully resolved. P: Continue the intervention. I: Encouraged the child and parents to watch the educational video on YouTube titled *"Video Edukasi TBC Pada Anak"*, uploaded by Direktorat Pelayanan Kesehatan Keluarga. E : The client's mother reported that the child no longer has difficulty taking the medication and does not get angry when asked to take it. R: Continue the intervention.	S : The client's mother stated that the child is no longer having difficulty taking the medication and does not get angry when asked to take it. O : The client and her parents have watched the recommended educational video. A: Non-compliance has not yet been fully resolved. P: Continue the intervention. I: Encouraged the child and parents to watch the educational video on YouTube titled *"Video Edukasi TBC Pada Anak"*, uploaded by Direktorat Pelayanan Kesehatan Keluarga. E : The client's mother reported that the child no longer has difficulty taking the medication and does not get angry when asked to take it. R: Continue the intervention.	S : The client's mother stated that the child is no longer having difficulty taking the medication and does not get angry when asked to take it. O : The client and her parents have watched the recommended educational video. A : non-compliance resolved P : Stop intervention

Based on the evaluation results over a period of three days, progress was observed in addressing the nursing problem of non-compliance. Prior to the assessment, the client was

experiencing non-compliance with tuberculosis medication. However, after the implementation of video-based education, the client demonstrated improved adherence. By the third day, the client consistently took the medication as prescribed.

Discussion

The researcher conducted daily evaluations following each intervention. After the first day of intervention, the client's mother reported that the child no longer had difficulty taking the medication and did not become angry when asked to take it. To ensure sustained adherence and prevent any decline, the intervention was continued on the second and third days. The evaluation results on both the second and third days remained consistent, with the client's mother confirming that the child continued to take the medication without resistance or emotional outbursts. Based on these consistent positive outcomes, the intervention was concluded on the third day.

The intervention results demonstrated that video-based education can improve medication adherence. These intervention results are supported by research conducted on proper and correct English(Agustina et al., 2024) Based on the results of the intervention, it can be concluded that video-based education is effective in improving medication adherence. This finding is supported by a study conducted at RSUD Depok, which implemented audiovisual-based educational interventions and reported an increase in the average adherence score from 6.06 to 7.56, with a p-value of < 0.001. This is consistent with the present case study on the implementation of video-based education to improve medication adherence in a child with tuberculosis, in which evaluation results showed that educational videos successfully enhanced the child's adherence to TB treatment.

The difference lies in the sample size and research methodology. Agustina's study involved a sample of 18 participants and used a quasi-experimental design with a one-group pre-test and post-test approach. In contrast, this case study involved only one subject and applied the PICO method, which includes identifying relevant clinical questions, searching for related evidence, appraising the evidence, applying it in practice, and evaluating the outcomes. He outcome measure in Agustina's study was analyzed using a T-test, whereas in this case study, the evaluation was conducted based on observations after the implementation of video-based education.

Restate the Key Findings

After three days of intervention, the patient's adherence significantly improved. Initially, the child frequently refused medication, but after watching educational videos together with parents, the patient began to accept and regularly take the medication without resistance.

Interpret the Results

The video-based educational intervention proved effective in improving medication adherence in a child with TB. This indicates that audiovisual media can help children understand the importance of treatment and reduce resistance to long-term therapy.

Compare with Previous Studies

These findings are consistent with studies by Agustina et al. (2024) and Daniati & Romalina (2025), which demonstrated that audiovisual education improves adherence scores among TB patients. The main difference is that this research is a single case study, while previous studies involved larger sample sizes.

Highlight the Implications

This study implies that video-based educational interventions can serve as an alternative strategy in health promotion, particularly in enhancing medication adherence among pediatric TB patients who require long and complex treatment.

Discuss the Limitations

The limitation of this study is the small sample size (only one subject) and the short intervention duration (3 days), which cannot guarantee sustained adherence throughout the full 6-month TB therapy.

Suggest Future Research

Future research is recommended to employ a quasi-experimental design with a larger sample size and longer intervention duration to examine the effectiveness of video education on TB treatment adherence.

Conclusion

The author conducted a nursing assessment of An. L over a period of three days (3×24 hours) using methods such as interviews, observation, physical examination, and documentation. The interview was carried out directly to gather data on the client's identity, chief complaint, current illness history, past medical history, and family medical history. A comprehensive physical examination was performed using a head-to-toe approach to obtain an objective overview of the client's physical condition.

Following the implementation of nursing interventions based on the planned care strategy, an evaluation was conducted to assess the client's progress and the effectiveness of the interventions provided. Based on the three-day evaluation, the nursing problem of Non-compliance related to a complex and/or long-term treatment program in An. L was successfully addressed through a video-based educational approach.

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Ethical Clearance

This study received ethical approval from STIKes Muhammadiyah Ciamis and informed consent was obtained from the patient's parents.

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