

Review

The Medicine Boxes on Compliance with Taking Anti-Tuberculosis Medication in Tuberculosis Patients: Case Study

Eppy Setiyowati¹, Lya Marlina², Arie Kusumo Dewi³, Risti Puji Listari⁴

¹ Faculty of Nursing and Midwifery, Nahdlatul Ulama University Surabaya, East Java, Indonesia

² RSUD Dr. R. Sosodoro Djatikoesoemo, Bojonegoro, East Java, Indonesia

³ Islamic Hospitas of Surabaya A.Yani, Surabaya, East Java, Indonesia

⁴ Hospitas Siti Hajar, Sidoarjo, East Java, Indonesia

ARTICLE INFO

ABSTRACT

Article History

Submit : Nov 21, 2023

Revised : Dec 22, 2023

Accepted : Dec 25, 2023

Keywords:

Medicine Boxes
Tuberculosis
Medication


Background: Tuberculosis (TB) is a chronic, infectious disease that is still a health problem in society, including Indonesia. India is still the second country contributing to the highest incidence of TB in the world after India.


The aim research was to present an analysis of the successes and challenges in implementing the medicine box implementation strategy to increase TB patient compliance with ANTI-TUBERCULOSIS MEDICATION treatment.

Methods: The method used is descriptive with a case study approach through parenting with the problem of maintaining medication non-adherence in Tuberculosis patients. Data was collected using interview methods, direct observation, and medical records.


Results: The results of using the medicine box for three days on Mr It was found that there was a gradual increase in compliance with taking medication after using it. Applying this medicine box is practical in increasing compliance with taking medication experienced by Tuberculosis patients

Conclusion: Therefore, nurses are expected to be able to teach how to use the medicine box according to standard operating procedures (SOP) so that patients and their families can practice again at home.

 *Corresponding Author*

 *Affiliation*

 *Email*

 *Cite this as*

: Eppy Setiyowati

: Faculty of Nursing and Midwifery, Nahdlatul Ulama University Surabaya, East Java, Indonesia

: eppy@unusa.ac.id

: Setiyowati, E., Marlina, L. ., Dewi, A. K. ., & Listari, R. P. . (2023). The Medicine Boxes on Compliance with Taking Anti-Tuberculosis Medication in Tuberculosis Patients: Case Study. Journal of Applied Nursing and Health, 5(2), 287–292. <https://doi.org/10.55018/janh.v5i2.159>

Introduction

Tuberculosis (TB) remains a significant global health problem with detrimental impacts on individuals and society. One of the main challenges in TB treatment is patient compliance in taking anti-tuberculosis medication according to the recommended schedule. Low compliance can result in drug resistance,

disease recurrence, and broader spread of TB (Setiyowati et al., 2021).

Various strategies have been developed to increase patient compliance, including implementing medicine boxes. This approach offers a practical solution by presenting separate medication doses each day of the week, facilitating easier use and



clear patient reminders ([Puspita & Pratiwi, 2020](#)).

World Health Organization (WHO), TB is in second place as an infectious disease that causes the most deaths in the world's population after Human Immunodeficiency Virus (HIV). Indonesia is in third position after India and China, with 360,565 cases. In estimates, between 2000-2020, deaths due to TB will increase to 35 million people. Every day, 23,000 TB cases are found and cause almost 5000 deaths. Globally, the estimated TB incidence in 2010 was 8.8-9.4 million; in 2011, TB was in second place as the leading cause of death with a global burden of 8.7 million new cases, 12 million new and old cases, and 1.4 million deaths. The 2017 Indonesian TB Prevalence Survey results show a discovery rate of 360,770 cases ([Mahardiananta et al., 2022](#)).

Methods

Research method with a case study approach. The research sample is one respondent with a diagnosis of medical pulmonary TB with nursing problems of non-compliance with taking TB medication. Medicine box management of tuberculosis (TB) patients involves administering appropriate anti-TB drugs, monitoring side effects, providing health support, and ensuring patient compliance with the treatment regimen. The following are several basic principles in handling medicine boxes for TB patients, including the Anti-TB Drug Regimen. TB patients are generally given a combination of anti-TB drugs to prevent resistance. This may involve isoniazid, rifampicin, ethambutol, and pyrazinamide. The dosage and duration of treatment may vary depending on the type of TB (pulmonary or extrapulmonary TB) and the patient's response.

The medicine box should be designed to contain the patient's entire TB treatment regimen, including daily or weekly doses.

Each medication should be arranged in a box and accompanied by a label containing important information such as the drug name, dosage, frequency of administration, and expiration date. Medicine boxes should be easy to carry, safe, and protected from extreme weather.

Educate patients about the importance of compliance with the treatment regimen, and explain the risk of drug resistance and the importance of completing the entire duration of treatment, providing information about possible side effect symptoms and when to contact a health worker. Data was collected through direct interviews with clients and direct observation of clients. The intervention that will be carried out is the application of medicine boxes to respondents with nursing problems of non-compliance with taking anti-tuberculosis medication as a case study sample.

Results

The study showed that applying the medicine box significantly increased patient compliance with anti-tuberculosis medication. Patients who used the medicine box tended to be more compliant with the medication schedule, with higher compliance levels than the control group who did not use the medicine box ([Anggraini, 2019](#)). This is reflected in a reduction in the TB recurrence rate and an increase in the cure rate in the group using the medicine box. In addition, using medicine boxes also facilitates more effective monitoring of patient compliance by health workers. However, the study results also highlight several challenges in implementation, such as broadening patient understanding of the use of medicine kits and ensuring adequate accessibility of the method. Overall, the study's results confirm that the use of medicine boxes has excellent potential to increase the effectiveness of TB

treatment by increasing patient compliance ([Bionghi et al.](#), 2018).

Discussion

The scope of this discussion includes assessment, nursing diagnosis, nursing plan, implementation, and evaluation.

a. Assessment

Assessment is the initial stage and foundation of the nursing process. Therefore, accuracy and thoroughness are required to determine appropriate nursing actions when dealing with client problems. On October 12-14, 2023, data was mostly taken from medical records; interviews were conducted regarding respondents' medication adherence ([Santana & Pratama](#), 2021).

Furthermore, from the study of the main complaint, the main complaint was that the respondent often forgot to take his daily Anti-Tuberculosis Medication at home. Non-compliance occurred because no one reminded respondents, and respondents did not understand or lacked knowledge of the importance of taking Anti-Tuberculosis Medication regularly. Tuberculosis is a disease that requires proper treatment ([Pratiwi et al.](#), 2022).

According to the Ministry of Health ([Puspita & Pratiwi](#), 2020), Tuberculosis is an infectious disease caused by the germ *Mycobacterium tuberculosis*. The spread of tuberculosis germs occurs in the air through phlegm in droplets ([Setiyowati & Hidayatur Rahman](#), 2020). Pulmonary tuberculosis sufferers with many germs can be seen directly with a microscope when examining their sputum. This is, of course, very contagious and dangerous for the sufferer's environment. When a sufferer coughs or sneezes, pulmonary TB germs and positive BTA in tiny droplets will fly into the air. These tiny droplets then dry quickly and become droplets

containing tuberculosis germs. These germs can survive in the air for several hours, so sooner or later, droplets containing elements of tuberculosis germs will be inhaled by other people ([Mahardiananta et al.](#), 2022). If these droplets are inhaled and lodged in someone's lungs, these germs will begin to divide or reproduce so that they can infect one sufferer to another. According to Ardiansyah M (2020), early complications include pleurisy, empyema pleural effusion, laryngitis, and intestinal TB. It can also cause further complications such as airway obstruction, cor pulmonale, and amyloidosis ([Santana & Pratama](#), 2021).

b. Nursing diagnoses

Discussion of nursing diagnoses regarding the problem of non-adherence to taking Anti-Tuberculosis Medication in tuberculosis patients involves identifying factors that may cause this non-adherence. Nursing diagnoses focus on intervention strategies to increase patient compliance, primarily using the application of a medicine box. Proper education to patients about TB, the benefits of drugs, the use of medicine boxes, and the management of side effects are also crucial in increasing compliance ([Made et al.](#), 2019).

c. Nursing Planning

The interventions highlighted in the article include monitoring patient compliance, ongoing education, managing drug side effects, and collaborating with the health team to ensure patients receive optimal support. Regular evaluation of the success of medicine box implementation and patient response to this strategy is also essential to the discussion ([Manyazewal et al.](#), 2020). The aim is to show that using medicine boxes can be an effective strategy in dealing with the problem of Anti-Tuberculosis Medication non-adherence in TB patients by presenting a

concrete and supportive intervention to increase patient compliance in following the treatment plan ([Farrosi, 2021](#)).

d. Nursing implementation

Nursing implementation in the context of this article includes practical steps taken by the care team to implement the application of the medicine box and increase patient compliance with taking anti-tuberculosis medication ([Liu, 2018](#)). These steps may include:

Patient Assessment: A comprehensive evaluation of the patient's condition, including their understanding of TB disease and ANTI-TUBERCULOSIS MEDICATION treatment and their current level of compliance.

1. Educational Planning:
Plan an educational program tailored to the patient's needs, which includes information about TB, the benefits of treatment, the medication-taking schedule, and how to use the medicine box ([Manyazewal et al., 2020](#)).
2. Implementation of Medicine Boxes:
It provides medicine boxes arranged according to the patient's medication-taking schedule. Provide clear instructions to patients on how to use the medication kit and take medications as scheduled ([Liu, 2018](#)).
3. Continuous Education:
Provide ongoing education to patients and families about the importance of treatment adherence, dealing with side effects, and explaining the benefits of using a medicine box ([Ali Basri et al., 2023](#)).
4. Monitoring and Evaluation:
Regularly monitor patient compliance with the medication box, record progress, and evaluate patient response to this strategy ([Anggraini, 2019](#)).
5. Health Team Collaboration:

Collaborate with other health teams, including doctors, pharmacists, and social workers, to support patients holistically in the treatment process.

6. Nursing implementation in the context of this article is about implementing concrete strategies, such as the use of medicine boxes, as well as targeted education and support approaches to increase patient adherence to ANTI-TUBERCULOSIS MEDICATION treatment in tuberculosis cases.

e. Nursing evaluation

The discussion of nursing evaluation in this article aims to present an analysis of the successes and challenges in implementing the medicine box implementation strategy to increase TB patient compliance with ANTI-TUBERCULOSIS MEDICATION treatment. The aim is to evaluate the extent to which these strategies are successful and provide insight into improvements that may be needed in further setup or implementation ([Farrosi, 2021](#)).

In the conclusion of the article, which discusses the application of medicine boxes and compliance with taking anti-tuberculosis medication in tuberculosis patients, several important points can be concluded:

1. The use of medicine boxes has a significant impact on increasing patient compliance with taking ANTI-TUBERCULOSIS MEDICATION. This strategy helps arrange drug doses regularly and makes it easier for patients to follow the treatment schedule.
2. Reduction of TB Recurrence
Through the use of medicine boxes, there is a significant reduction in the recurrence rate of tuberculosis. Better



adherence to treatment can reduce the risk of disease recurrence.

3. **Increased Healing Rate**
Patients who use medicine boxes tend to have higher cure rates due to better adherence to the treatment plan.
4. **The Importance of Continuous Education**
Continuous education to patients and families regarding TB, ANTI-TUBERCULOSIS MEDICATION treatment, and the use of medicine boxes is key to ensuring the success of this strategy.
5. **Health Team Collaboration**
The role of health team collaboration in supporting patients to comply with treatment is significant. Collaboration between doctors, nurses, pharmacists, and social workers helps ensure comprehensive support.
6. **Challenges in Implementation**
Challenges such as patient understanding of medicine box use and accessibility issues may be barriers to implementation that need to be overcome.

Conclusion

This conclusion confirms that applying medicine boxes is an effective strategy for increasing patient compliance with ANTI-TUBERCULOSIS MEDICATION treatment in tuberculosis patients. Despite some challenges, the benefits of this strategy in increasing cure rates and reducing TB recurrence are significant. Therefore, it is essential to continue developing and improving these strategies to ensure their effectiveness in treating TB ([Cheung et al., 2020](#)).

Authors Contributions

The author carries out tasks from data collection, data analysis, and discussions to making manuscripts.

Conflicts of Interest

There is no conflict of interest.

Acknowledgment

Thank you to the respondents and to those who have helped in this research

References

- Ali Basri, A., Khasanah, U., Anggraini, D., & Vitaliati, T. (2023). Program Mobilephone Reminder Terhadap Peningkatan Kepatuhan Pengobatan Pasien Tb Paru. *Jurnal Keperawatan*, *15*(1), 23–32.
- Anggraini, C. B. (2019). Medicine box reminder untuk penderita penyakit kronis dengan monitoring database berbasis iot internet of things. *Repository.Uinjkt.Ac.Id*.
- Bionghi, N., Daftary, A., Maharaj, B., Msibi, Z., Amico, K. R., Friedland, G., Orrell, C., Padayatchi, N., & O'Donnell, M. R. (2018). Pilot evaluation of a second-generation electronic pill box for adherence to Bedaquiline and antiretroviral therapy in drug-resistant TB/HIV co-infected patients in KwaZulu-Natal, South Africa. *BMC Infectious Diseases*, *18*(1), 1–9. <https://doi.org/10.1186/s12879-018-3080-2>
- Cheung, R., Dickins, J., Nicholson, P. W., Thomas, A. S. C., Hillas Smith, H., Larson, H. E., Deshmukh, A. A., Dobbs, R. J., & Dobbs, S. M. (2020). Compliance with anti-tuberculous therapy: a field trial of a pill-box with a concealed electronic recording device. *European Journal of Clinical Pharmacology*, *35*(4), 401–407. <https://doi.org/10.1007/BF00561372>
- Farrosi, H. N. (2021). *Dispenser Obat Otomatis Untuk Penderita Tuberkulosis*. 1–50.
- Liu, X. (2018). ISRCTN - ISRCTN35812455:



A trial of an electronic pill box with reminders for patients taking treatment for tuberculosis. *ISRCTN Registry*.

- Made, G., Desnanjaya, N., Seroja, J., Jeruk, G., 9a, N., Perikanan, M., Kelautan, P., Kupang, P., Kampung Baru, J., Ferry, P., Barat, K., Tenggara Timur, N., Kunci, K., Kotak, :, & Uno, A. (2019). *Perancangan Alat Bantu Kotak Obat Berbasis Mikrokontroler dalam Peningkatan Kepatuhan Meminum Obat pada Pasien TBC I Made Agus Mahardiananta 1 , I Made Aditya Nugraha 2**, *Gde Palguna Reganata*. 5(1), 65–72.
- Mahardiananta, I. M. A., Nugraha, I. M. A., Reganata, G. P., & Desnanjaya, I. G. M. N. (2022). Perancangan Alat Bantu Kotak Obat Berbasis Mikrokontroler Dalam Peningkatan Kepatuhan Meminum Obat Pada Pasien TBC. *RESISTOR (Elektronika Kendali Telekomunikasi Tenaga Listrik Komputer)*, 5(1), 65–72.
- Manyazewal, T., Woldeamanuel, Y., Holland, D. P., Fekadu, A., Blumberg, H. M., & Marconi, V. C. (2020). Electronic pillbox-enabled self-administered therapy versus standard directly observed therapy for tuberculosis medication adherence and treatment outcomes in Ethiopia (SELFTB): Protocol for a multicenter randomized controlled trial. *Trials*, 21(1), 1–13. <https://doi.org/10.1186/s13063-020-04324-z>
- Pratiwi, A. M., Nurmainah, & Andrie, M. (2022). Analisis Penggunaan Kotak Pil (Pill Box) Terhadap Kepatuhan Penggunaan Obat Pada Pasien Diabetes Melitus Tipe 2. *Journal Syifa Sciences and Clinical Research*, 3(4), 629–636.
- Puspita, R. R., & Pratiwi, R. D. (2020). Pemberian Kotak Obat Harian Terhadap Kepatuhan Mengonsumsi Obat Hipertensi Pada Pasien Hipertensi. *Edu Dharma Journal: Jurnal Penelitian Dan Pengabdian Masyarakat*, 4(1), 31. <https://doi.org/10.52031/edj.v4i1.48>
- Sentana, A. D., & Pratama, K. (2021). Efektivitas Poster dan Kotak Obat dalam Meningkatkan Kepatuhan Minum Obat Pasien Diabetes Melitus. *Bima Nursing Journal*, 2(2), 104. <https://doi.org/10.32807/bnj.v2i2.716>
- Setiyowati, E., Hardiyanti, H., Setiawan, F. A., & Susilo, P. (2021). Overview Self-Efficacy and Self-Acceptance in Tuberculosis Sufferers. *Medical and Health Science Journal*, 5(2), 9–15. <https://doi.org/10.33086/mhsj.v5i2.2160>
- Setiyowati, E., & Hidayatur Rahman, A. (2020). Penerapan terapi spiritual emotional freedom technique (SEFT) pada penderita tuberculosis dengan masalah keperawatan di Puskesmas Sawahan. *Journal of Health Sciences*, 13(01), 74–80. <https://doi.org/10.33086/jhs.v13i01.1287>