

## FAMILY IMPLEMENTATION OF MEDICATION SUPERVISION IN PULMONARY TB PATIENTS AT DELI SERDANG REGENCY

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### **ABSTRACT**

*Pulmonary Tuberculosis (TB) remains a significant public health problem, with transmission within the household being a major source of new cases. Appropriate preventive behaviors by immediate family members are crucial in breaking the chain of transmission. This study aims to comprehensively analyze and describe the implementation of medication supervision (DOTS/PMO) by family members for Pulmonary Tuberculosis (TB) patients at Deli Serdang Regency. To achieve these objectives, this study adopted a qualitative approach with a descriptive phenomenological study design. Data were collected through in-depth semi-structured interviews and non-participant observation with 15 immediate family members living with TB patients. Data were analyzed inductively using thematic analysis to identify behavioral patterns, barriers, and supports experienced by the participants. The study revealed that all family members took their complete anti-TB medication regimen regularly until they recovered, thanks to the family's involvement and collaboration with health workers at Deli Serdang Regency, who routinely conducted weekly monitoring. Health workers are expected to design more practical, contextual, and sustainable educational intervention programs that focus not only on the patient but also on empowering all family members as active prevention units, including providing psychosocial support to reduce the burden of caregiving.*

**Keywords:** *Pulmonary Tuberculosis; Family Impelementaion; Keluarga; Medication Supervision;*

## INTRODUCTION

Pulmonary tuberculosis (TB) remains a major public health problem worldwide. According to reports *World Health Organization* (WHO) pada tahun 2020 In 2020, globally, pulmonary TB caused one point two million deaths in developing countries, with 10 million new cases of pulmonary TB and one point three million deaths worldwide. Pulmonary TB disproportionately affects individuals in low- and middle-income countries. (Shamanewadi et al., 2020). In 2020, pulmonary TB was the 13th leading cause of death worldwide caused by a single infectious agent (WHO, 2020).

Geographically, Southeast Asia contributed the largest number of cases in the world at 43%, with Indonesia ranking as the second-highest contributor (8.5%) after India. In Indonesia, the number of pulmonary TB cases in 2020 reached 845,000, with a mortality rate of 98,000—equivalent to 11 deaths per hour where the most affected age group was the productive population aged 45 to 54 years (17.3%). (WHO, 2021).

The number of cases of pulmonary TB in Indonesia in 2020 was 845,000 with the discovery of 130 new cases per 100,000 population and a mortality rate of 98,000 or equivalent to 11 deaths/hour, the most cases of pulmonary TB were found in the age group of 45 to 54 years, namely 17.3 percent, followed by the age group of 25 to 34 years at 16.8 percent and the age group of 15 to 24 years at 16.7 percent (Kementerian Kesehatan Republik Indonesia, 2021). North Sumatra Province is the ninth largest contributor of pulmonary TB cases in Indonesia with a prevalence of 33,779 and 138 per 100,000 population of new cases and a death rate of 782 cases in 2020. (Kementerian Kesehatan Republik Indonesia, 2021). The proportion of TB patients with less than six months who regularly take medication is 72.6 percent and 27.4 percent of their status is unknown and this figure is higher than the national average of 69.2 percent. (Kementerian Kesehatan RI, 2019). This indicates that the rate of pulmonary TB transmission in North Sumatra Province remains very high. According to data from the North Sumatra Provincial Health Office, 23.2 percent of pulmonary TB cases originate from Deli Serdang Regency.

In the Deli Serdang region, there were 3,259 cases of pulmonary TB in 2018, 7,836 in 2019, and 7,840 in 2020, with an incidence rate of 92.06 per 100,000 residents and a mortality rate of 90 cases per year. The highest number of new cases of pulmonary TB was among those aged

45-54 years (20.6 percent), and the lowest number was among those aged 0-4 years (1.7 percent). Most new cases of pulmonary TB occurred in men (62.7 percent), while in women (32.7 percent). (Dinas Kesehatan Kabupaten Deli Serdang, 2020). The data above shows that there has been an increase in cases in the Deli Serdang Regency area.

The increase in TB cases not only impacts morbidity and mortality rates in the community but also impacts other health problems. According to research results, TB sufferers Diamanta et al. (2020) suffer from psychological disorders and a low quality of life. TB cases also impact the economy. In Indonesia, the total budget required for TB control during the 2020-2024 period reached 47.3 trillion rupiah.h (Kementerian Kesehatan Republik Indonesia, 2020).

Families play a vital role in the healing process of TB patients. They are the direct group that interacts with family members 24/7. Puri (2018) One of the duties of family members is to care for sick family members and prevent transmission to healthy family members. The family acts as the primary caregiver, encouraging TB patients to recover and is a key attribute in the process of preventing TB transmission, which requires family involvement, collaboration, negotiation, counseling, information sharing, and family support (Rakhmawati et al., 2020). Family involvement in preventing TB transmission plays a role in increasing family awareness and willingness to maintain and improve the health status of its family members (Prasad et al., 2016). Families and TB sufferers need to be empowered by providing adequate information about TB and the importance of prevention and control efforts, so that they can change family behavior in developing aspects of knowledge, understanding, changes in attitudes and actions, health awareness of family members in the care, treatment and prevention of transmission of pulmonary TB. (Marwansyah & Sholikhah, 2015). Prevention of pulmonary TB in the family includes providing immunizations, improving the nutrition of TB sufferers, modifying the home environment and adherence to TB treatment by the family. (Paneo & Nursasi, 2019). Interviews were conducted with 12 families of TB patients. The families ranged in age from 22 to 39, with the majority having a high school education and the remainder having a junior high school education. The families stated that TB medication was obtained from the community health center and that the patient was responsible for taking it regularly. Ten families did not supervise the treatment process, and only three families were able to accompany the patient to the community health center when the patient sought treatment.

The magnitude of this problem is particularly evident in North Sumatra Province, which is the ninth-largest contributor of pulmonary TB cases in Indonesia, recording a death rate of 782 cases in 2020. Data from the North Sumatra Provincial Health Office identifies Deli Serdang Regency as the primary locus of the problem, accounting for 23.2% of all cases in the province. In the Deli Serdang region, there has been a significant surge in cases, rising from 3,259 in 2018 to 7,840 in 2020, with an incidence rate of 92.06 per 100,000 residents. A critical gap exists between clinical compliance and community transmission; although the proportion of patients in North Sumatra who regularly take medication (72.6%) is higher than the national average (69.2%), the rate of pulmonary TB transmission in the province remains very high. This indicates a discrepancy between individual treatment adherence and the effectiveness of broader infection control measures. The urgency of this research lies in the necessity to break the chain of transmission in Deli Serdang, especially given that the highest number of new cases occurs among the productive age group (45-54 years), which threatens both public health and regional socio-economic stability.

Based on the above background, it appears that the implementation of prevention of transmission of pulmonary TB in families has not been carried out properly and in Deli Serdang Regency there has never been any research conducted on preventing transmission of pulmonary TB in families, for this reason the author is interested in conducting research on family-based prevention of transmission of TB in Deli Serdang Regency, North Sumatra. The benefits of this study are expected to provide strategic recommendations for local health authorities to improve TB control programs and to enhance the body of knowledge in emergency and community nursing regarding the management of chronic infectious diseases.

## **METHOD**

This study uses qualitative research with a phenomenological approach to clearly and deeply describe the meaning of the experience of the closest family who lives in the same house with a Pulmonary TB patient in supervising medication intake to prevent the transmission of Pulmonary TB in the family. The study was conducted at Deli Serdang Regency. The informants who became the subjects in this study were the closest family members of Pulmonary TB patients who live in the same house in Deli Serdang Regency. Data were

obtained through direct observation and in-depth interviews with predetermined informants. The research instrument used an in-depth interview guide created by the researcher using open-ended questions based on relevant theoretical foundations. The questions focused on the role of the family of Pulmonary TB patients in supervising medication intake to prevent the transmission of Pulmonary TB, which contained questions about the family's experience in supervising the taking of Pulmonary TB medication and the actions taken by the family in supervising the taking of medication by their family members who suffer from Pulmonary TB. The interview guide has been tested for validity by three experts including health workers and cadres at Haji General Hospital, Deli Serdang Regency. Qualitative data analysis used a thematic analysis approach. Data processing was carried out using the Nvivo 12 program. Data analysis was carried out using the phenomenological analysis method which refers to (Smith, Flowers & Larkin, 2009) about Interpretative Phenomenological Analysis (IPA). This technique was chosen to conduct in-depth testing of a person's direct experiences.

**RESULTS AND DISCUSSION**

Interviews were conducted with 12 selected informants, the first informant was the wife of a pulmonary TB sufferer who lives in Bintang Meriah Village.

**Table 1 Demographic Characteristics of Informants**

Informant	Ages	Family relationship	Last education	Current Employment
1	43	Wife	Senior High School	farmer
2	55	Father	Elementary school	Housewife
3	50	Younger brother-in-law	Elementary school	farmer
4	64	Son-in-law	Elementary school	farmer
5	50	Parents in law	Junior High School	farmer
6	63	Wife	No School	farmer
7	63	Wife	No School	farmer
8	33	Wife	Junior high school	farmer
9	42	Wife	Elementary school	farmer

10	42	Father	Junior high school P	self-employed
11	48	Father	Senior High School	farmer
12	49	Wife	Senior High School	farmer

The results of this study are the results of in-depth interviews conducted with informants and field notes found during in-depth interviews. Data analysis used the IPA method developed by J.A. Smith (2009). The results of the analysis obtained a series of themes that provide family experiences about the Prevention of Pulmonary TB transmission in the supervision of taking medication in Pulmonary TB patients. Based on the results of interviews and FGDs, it was found that Compliance with taking medication found 3 sub-themes, namely reminding to take anti-Pulmonary TB drugs, taking anti-Pulmonary TB drugs completely and regularly until cured with the following themes:

Table 2. Themes and Subthmes of the Research

Main Theme	Subtheme	(Findings on Medication Compliance)	Compliance Category/Focus
I. Collaborative Oversight Mechanism in Daily Compliance	1. Remind to take anti-TB medication		<p>A. The Role of the Family as an Active PMO: Patients and families (I1, I3) remind each other. The family (I3) monitors and checks the availability/remaining medication..</p> <p>B. Utilization of Visual and Digital Reminders: Use of calendars (checklists) at the front door (I8) and communication via electronic media (telephone/cellphone) by</p>

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	families and health workers (I8, I12).
Compliance, Quality, and Continuity of Therapy	<p>C. Involvement of Health Workers: Health workers (Community Health Centers) actively monitor, communicate, and call if patients do not come for weekly check-ups (I10, I12).</p> <hr/> <p>A. Patient's Self-Discipline Commitment: The patient has high discipline and is aware that medication should not be missed even once ("Don't even once, he said, the term is missed" - I3).</p>

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### Collaborative Oversight Mechanism in Daily Compliance

The study identified that a collaborative oversight mechanism between patients and their families is a fundamental factor in ensuring medication adherence. This mechanism is manifested through several key behaviors:

#### 1. Family Reminders and Mutual Encouragement

One informant (I1) stated: *"Sometimes he remembers himself, Ma'am, sometimes I remind him, have you taken your medicine yet? Yes, take your medicine, eat it."* This illustrates that while patients may have internal motivation, the family acts as an external reinforcing factor. This finding aligns with the **Health Belief Model**, where reminders from family members serve as "cues to action" that trigger the patient's health-related behavior. Previous research indicates that TB patients with a dedicated "Treatment Observer" (*Pengawas Menelan Obat* or PMO) from their own family have significantly higher success rates compared to those without close supervision. The emotional bond within the family reduces the psychological burden of long-term therapy.

- 2. Internalization of Compliance as a Habit** Informant I3 shared: *"...Yes, I said, ma'am, you have to take your medication regularly, never, so your body can heal quickly... we're family, we've been taking medication, that's how it is, so sometimes the medication is checked..."*.

This statement shows that compliance has moved beyond mere instruction and has become a household habit. Linking this to the research objective of understanding compliance mechanisms, the family's role in "checking" the medication ensures that no doses are missed. Theoretically, this relates to Social Cognitive Theory, where the environment (family) and behavior (checking medication) interact to produce consistent outcomes. Regular monitoring by the family minimizes the risk of multi-drug resistant TB (MDR-TB), which often occurs due to intermittent adherence.

**3. Utilization of Technology and Visual Aids**

Informants highlighted the use of electronic media to communicate with health workers and visual aids to maintain schedules. One informant (I8) noted: *"I put it on the calendar in front of the door so that I don't forget... because I'm afraid that when I go to the doctor I'll forget to go to the doctor again..."*.

The use of calendars and checklists as visual prompts is a proven cognitive behavioral strategy to enhance memory and commitment. Furthermore, involving health workers via electronic media demonstrates a collaborative care model that bridges the gap between the clinical setting and the patient's home. This finding supports previous studies suggesting that mHealth (mobile health) and simple physical reminders significantly improve clinic attendance and medication persistence in chronic disease management.

**4. Remind to take anti-TB medication**

*Informans 11 says "Sometimes he remembers himself, Ma'am, sometimes I remind him, have you taken your medicine yet? Yes, take your medicine, eat it." I1*

This informant's statement stated that the family and patient always remind each other about taking anti-TB drugs. Families monitor adherence to anti-TB medication. Furthermore, patients are accustomed to taking their medication without being reminded by their families because it has become a daily habit, as evidenced by the statement below:

*"...Yes, I said, ma'am, you have to take your medication regularly, never, so your body can heal quickly. The most important thing is your sister, that's his wife.*

*Secondly, we're family, we've been taking medication, that's how it is, so sometimes the medication is checked, you can check that, ma'am." I3.....*

The family also involves health workers by always communicating via electronic media, asking for medication and weekly check-ups by bringing used medication packaging.

*"Never, it's like this with him, ma'am. When we were still using a tablet, we were on our phones with him, once every two weeks, because he wasn't always there. Sometimes he was, sometimes not in the cage.*

*"I put it on the calendar in front of the door so that I don't forget, ma'am, because I'm afraid that when I go to the doctor I'll forget to go to the doctor again, she said, because she's afraid that I..." I8.*

This informant's statement states that when taking medication, patients should recognize the color and shape of the medication and create a checklist on a calendar so that patients can see whether the medication is being taken correctly and not forget a single dose. The involvement of family and patients in reminding patients to take their TB medication is mutually supportive of their recovery.

## **5. Roles of the Healthworkers**

*The Informant 10 says "We are her parents, ma'am. The health workers were also there, ma'am." I10*

This informant's statement stated that family and health workers participated in reminding people to take their TB medication.

*"Yes, take your medication regularly. Yes, if he doesn't follow through, we'll start again.*

*From the community health center. Yes, they're monitored. If he doesn't come, we're required to come once a week. If he doesn't come, we'll keep calling." I12.....*

This informant's statement indicates that family and healthcare workers play a role in patient recovery by consistently reminding patients to take their TB medication.

The informant stated that reminding patients to take their TB medication requires a significant role from the family, and reminders can be provided in the form of calendars or electronic media such as mobile phones. This research aligns with research conducted by (Febrina, 2018) that the role of the family consists of four, namely as a motivator, a role in reminding patients to repeat sputum examinations, a role in supervising treatment, and a role as an educator. (Fitri, 2018) He stated that it is important to remind TB patients to pay more attention to regularity in taking their medication and taking their medication according to the schedule. In this regard, family support is needed to improve TB patient compliance, which is a determining factor in ensuring the cleanliness of tuberculosis treatment. (Putri, 2021).

Taking anti-TB medication completely and regularly until cured. The family has a very important role for the compliance of pulmonary TB patients to take medication regularly and completely and support the patient's recovery and is responsible as a Medication Supervisor (PMO) who will continuously remind and supervise patients in taking medication regularly and on time according to the dosage determined by medical personnel (Firman Maulana Safri et al., 2014). The results of the interviews obtained by the majority of family members of pulmonary TB patients took their TB medication completely and regularly until cured. This is because there are families who always remind sufferers:

*"...in other words, he's been taking medication regularly. He's also taking his medication regularly, and he's had an X-ray every three months."*

*"He's been taking pills for six months straight, right? It used to be six months. Before that, he wasn't taking pills for six months, before that...abis, masih situ aja dia."I4*

This informant's understanding was that medication should not be interrupted or missed.

*"But yes... but he must be disciplined in taking the medication. Never, he said, "skip it." I3*

Informant 3's understanding was that regular medication intake is essential for TB medication adherence.

*"No, midwife Fatma used to give me the medication, but it doesn't matter if she gave me the medication, for example, if she didn't have time to go there, she would give me an extra dose for that week..." I8*

Informant 8's understanding was that the healthcare provider always reminded me to take the medication.

*"Yes, it has to be routine, I'll check on that, sis." I12*

Informant 12's understanding was that medication monitoring was necessary.

Interviews with informants revealed that all family members took their TB medication completely and regularly until they recovered, thanks to the family's involvement and collaboration with healthcare providers at Deli Serdang Regency

### **Conclusion**

The study concludes that medication adherence among pulmonary TB patients in Deli Serdang is fundamentally driven by a Collaborative Oversight Mechanism involving the patient, the family, and healthcare providers. Family members play a critical role as "cues to action" by providing consistent verbal reminders and emotional support, which transforms medication-taking from a burdensome requirement into an internalized daily habit. Furthermore, the integration of simple cognitive aids—such as calendars and checklists—alongside digital communication with health workers, effectively mitigates the risk of forgetfulness and strengthens the commitment to long-term therapy.

These findings highlight that while individual patient motivation is essential, the "social environment" provided by the family is the primary safeguard against treatment interruption. This collaborative approach is vital in addressing the high transmission rates observed in North

Sumatra, where despite relatively high adherence levels (72.6%), the magnitude of the TB burden remains a significant public health challenge. Therefore, nursing interventions should focus not only on the patient but on empowering the family unit as an active partner in the clinical management of pulmonary TB to ensure successful treatment outcomes and break the chain of transmission in the community.

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