

Determinants Of Recovery Among Pulmonary Tuberculosis Patients In Talang Putri Sub district

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ABSTRAK

Tuberkulosis (TB) paru masih menjadi masalah kesehatan global dengan tingkat keberhasilan pengobatan yang belum mencapai target WHO. Kesembuhan pasien TB dipengaruhi oleh berbagai faktor meliputi sosial ekonomi, individu dan eksternal. Penelitian ini bertujuan untuk mengetahui determinan yang berhubungan dengan perilaku kesembuhan pasien TB paru di Kelurahan Talang Putri. Penelitian ini merupakan penelitian kuantitatif dengan desain cross sectional yang dilakukan pada November 2025-Februari 2026. Responden penelitian berjumlah 80 pasien TB paru fase lanjutan yang dipilih dengan teknik convenience sampling. Data dikumpulkan melalui kuesioner dan rekam medis. Analisis data menggunakan Fisher Exact Test. Mayoritas pasien sembuh (97.5%). Faktor yang berhubungan signifikan dengan kesembuhan adalah pekerjaan ($p=0.014$; PR=9.75), usia ($p=0.043$; PR=5.2), riwayat pengobatan ($p=0.011$; PR=11.14), dan dukungan keluarga ($p=0.003$; PR=26.00). pendapatan ($p=0.519$), peran PMO ($p=1.00$) dan peran petugas kesehatan ($p=0.112$) tidak berhubungan signifikan dengan kesembuhan pasien TB. Kesembuhan pasien TB paru dipengaruhi oleh pekerjaan, usia, riwayat pengobatan dan dukungan keluarga, dengan dukungan keluarga sebagai faktor paling dominan. Penguatan intervensi berbasis keluarga sangat penting untuk meningkatkan keberhasilan pengobatan TB.

Kata Kunci: kesembuhan tuberkulosis, determinan, dukungan keluarga, kepatuhan pengobatan

ABSTRACT

Pulmonary tuberculosis (TB) remains a major global health problem with treatment success still below the WHO target. Recovery among TB patient is influenced by various determinants, including socioeconomic, individual and external factors. The study aimed to identify determinants associated with the recovery among pulmonary TB patients in Talang Putri Sub district. A quantitative study with a cross-sectional design was conducted from November 2025 to February 2026. The study involved 80 pulmonary patients in the continuation phase selected using convenience sampling. Data were collected through questionnaires and medical record. Data were analyzed using Fisher Exact Test. The majority of patients were cured (97.5%). Significant factors associated with recovery were employment ($p=0.014$; PR=9.75) age ($p=0.043$; PR=5.2), treatment history ($p=0.011$; PR=26.00). income ($p=0.519$), PMO role ($p=1.00$), and healthcare worker role ($p=0.112$) were not significantly associated with the recovery. Recovery among pulmonary TB patients is significantly influenced by employment, age, treatment history, and family support. Family support being the most dominant factor. Strengthening family-based intervention is essential to improve TB treatment outcomes

Keywords: tuberculosis recovery, determinants, family support, treatment adherence

INTRODUCTION

Pulmonary tuberculosis (TB) remains a major global public health problem caused by *Mycobacterium tuberculosis*, primarily affecting the lungs and is transmitted through airborne droplets when infected individuals cough or sneeze. It's contributing significantly to infectious disease mortality. According to the World Health Organization (WHO), there were approximately 10.6 million TB cases worldwide in 2023, with Indonesia ranked among the

countries contributing the highest burden.¹ At the national level, TB remains a critical concern. In South Sumatera, 23.256 TB cases were reported in 2023, with Palembang City contributing 7.379 cases. Although treatment success has improved, it still falls below the WHO target of 90%, with national achievement at approximately 86.5%.²

Successful TB treatment is highly dependent on patient adherence to the long-term therapy. The WHO recommended Directly Observed Treatment Short-course (DOTS) strategy emphasize the role of treatment supervisors (*Pengawas Menelan Obat/PMO*). The PMO plays a critical role not only in ensure medication adherence but also providing reminders for follow-up visits, psychosocial support and health education. Previous study have demonstrated that the presence and active role of PMO are associated with improved treatment adherence and higher recovery rate among TB patients.³⁻⁵

However, TB recovery is multifactorial outcome influenced not only by PMO. Socioeconomic factors such income level and employment status play an important role in determining access to healthcare services, nutritional status, and living conditions. Individual characteristics such as age and treatment history are critical determinants of TB outcomes. External factor also contribute significantly to TB recovery. Family support plays a vital role in providing emotional encouragement. Additionally, healthcare workers contribute through diagnosis, treatment provision education and monitoring. Despite of these roles, the relative contribution of each external factor may vary depending on local condition and patient characteristics.

Talang Putri Sub district is an area with dense population and diverse socioeconomic conditions, making it vulnerable to TB treatment challenges. Therefore, this study aimed to identify determinants influencing recovery among pulmonary TB patients in this area.

METHODE

This study employed a quantitative approach with a cross-sectional design to examine the determinants of recovery among pulmonary tuberculosis (TB) patients. The research was conducted in Talang Putri Sub district, the working area of Tegal Binangun Health Center, Palembang, from November 2025 to Februari 2026. The target population consisted of all pulmonary TB patients in the continuation phase undergoing treatment in Palembang. 80 respondents who met the inclusion criteria were successfully recruited using a convenience sampling technique. The inclusion criteria were patients residing in Talang Putri Sub district, registered for TB treatment at the health center, willing to participate, and having a treatment supervisor (PMO). Patients with cognitive impairment or incomplete medical records were excluded from the study.

The independent variables in this study included socioeconomic factors (family income and employment status), individuals factors (age and treatment history), and external factors (role of PMO, family support and healthcare workers). The dependent variable was the recovery status of pulmonary TB patients, defined clinically and bacteriologically based on medical records. Data were collected using structured questionnaires that had undergone validity and reliability testing, as well as secondary data from patient's medical records. Data analysis was performed using the Fisher Exact Test to determine the influence between socioeconomic, individuals and external factors with TB recovery status.

RESULT

Based on the data collected by researchers on 80 respondents, the following results were obtained:

Table 1 Frequency distribution of Respondents

Characteristic	Frequency (n)	Percentage (%)
Gender		
Man	53	66.2
Woman	27	33.8
Age		
Adolescence	6	7.5
Adults	57	71.3
Elderly	17	21.2
Employment		
yes	70	87.5
no	10	12.5
Income		
High	31	38.8
Low	49	61.2
History of treatment		
New cases	71	88.8
Old cases	9	11.2

Table 1 shows that the majority of respondents were male, totaling 53 respondents (86.2%). Based on age groups, most respondents were in the adult category (25-59 years), accounting for 57 respondents (71.3%). In terms of socioeconomic determinants, the majority of respondents were employed with 70 respondents (87.5%), and most had high income, totaling 31 individuals (38.8%). Regarding treatment history, the majority of respondents were new cases with 71 respondents (88.8%).

Table 2 Frequency distribution of external determinants

External determinants	Frequency (n)	Percentage (%)
PMO role		
Yes	71	88.8
No	9	11.2
Family support		
Yes	75	93.8
No	5	6.2
Healthcare worker's role		
Good	75	93.8
Bad	5	6.2

Based on table 2 shows that the majority of respondents had supportive PMO roles, totaling 71 respondents (88.8%), and received family support, totaling 75 respondents (93.8%). In additions, most respondent also experienced good healthcare worker support, with 75 respondents (93.8%).

Table 3 Frequency distribution of recovery of TB

Recovery of TB	Frequency (n)	Percentage (%)
Yes	78	97.5
No	2	2.5

Based on table 3 shows that a total of 78 respondents (97.5%) were recovered from TB, while 2.5% were not.

Table 4 The effect of employment and income with recovery of TB

employment	Recovery of TB				Total		P value	PR
	Non-recovery		recovery		n	%		
	n	%	n	%				
Yes	0	0	70	87.5	70	87.5	0.014	9.75
No	2	2.5	8	10.5	10	12.5		
Total	2	2.5	78	97.5	80	100		
income	Recovery of TB				Total		P value	
	Non-recovery		recovery		n	%		
	n	%	n	%				
High	0	0	31	38.8	31	38.8	0.519	
Low	2	2.5	47	58.7	49	61.2		
Total	2	2.5	78	97.5	80	100		

Respondents who were employed more likely to experience recovery compared to those who were unemployed. Fisher Exact Test showed that there was a significant effect of employment status on pulmonary TB recovery ($p=0.014$). Employed patients had a 9.75 times higher likelihood of recovery. Although the respondents with higher income tended to recover more (38.8%) and no non-recovery cases were observed in this research, income did not have a significant effect on pulmonary TB recovery ($p=0.519$).

The majority of productive respondents were with no cases of non-recovery observed in this research. In contrast, among elderly, 2 respondents (2.5%) did not recover. The Fisher Exact test showed a significant effect between age and history of treatment with recovery of TB ($p=0.043;0.011$). Patients in productive age had a 5.2 times higher likelihood of recovery compared to elderly.

Similarly, most respondents with new cases recovered, while 2 respondents (2.5%) with old cases did not recover. Based on table 5 also showed that patients with new cases had an 11.14 times higher likelihood of recovery compared to those with old cases.

Table 5 The effect of age and history of treatment with recovery of TB

age	Recovery of TB				Total		P value	PR
	Non-recovery		recovery		n	%		
	n	%	n	%				
Productive (adolescents- adult)	0	0	63	78.8	63	78.8	0.043	5.2
elderly	2	2.5	15	18.7	17	21.2		
Total	2	2.5	78	97.5	80	100		
History of treatment	Recovery of TB				Total		P value	PR
	Non-recovery		recovery		n	%		
	N	%	n	%				
New cases	0	0	71	88.8	71	88.8	0.011	11.14
Old cases	2	2.5	7	8.7	9	11.2		
Total	2	2.5	78	97.5	80	100		

Based on table 6. The majority of respondents with supportive PMO roles recovered, with no cases of non-recovery status, whereas 2 respondents (2.5%) with unsupportive PMO roles did not recover. Fisher Exact Test analysis showed that PMO role had no significant effect on pulmonary TB recovery ($p=1.00$). Similarly, most respondents who received family support recovered, with no non-recovery cases observed, while 2 respondents (2.5%) without family support did not recover. It's indicating that family support had a significant effect on pulmonary TB recovery ($p=0.003$). Patient with family support well had 26 times higher likelihood of recovery compared to those with no family support.

In terms of healthcare worker role, most respondents with good support recovered, although 1 respondent (0.5%) did not recover, compared to 1 respondent (2%) among those with poorer support. The analysis showed there was no significant effect on recovery ($p=0.112$). Overall, among all determinants examined, family support was identified as the most dominant factor on pulmonary TB recovery based on the p-value.

Table 6 The effect of PMO role, family support and healthcare worker's role with recovery of TB

PMO role	Recovery of TB				Total		P value	
	Non-recovery		recovery		n	%	1.00	
	n	%	n	%				
yes	0	0	69	88.8	69	88.8		
no	2	2.5	9	8.7	11	11.2		
Total	2	2.5	78	97.5	80	100		

Family support	Recovery of TB				Total		P value	PR
	Non-recovery		recovery		n	%	0.003	26.00
	n	%	n	%				
Yes	0	0	75	93.8	75	93.8		
no	2	2.5	3	3.7	5	6.2		
Total	2	2.5	78	97.5	80	100		

Healthcare worker's role	Recovery of TB				Total		P value	
	Non-recovery		recovery		n	%	0.112	
	n	%	n	%				
good	1	0.5	74	93.3	75	93.8		
bad	1	2	4	4.2	5	6.2		
Total	2	2.5	78	97.5	80	100		

DISCUSSION

This study aimed to analyze the determinants of recovery among pulmonary tuberculosis (TB) patients in Talang Putri Sub district. The findings indicate that recovery is influenced by a combination of socioeconomic individual and external factors, although not all variables showed statistically significant effects.

From the socioeconomic perspective, employment status was found to have a significant effect on TB recovery ($p=0.014$). Employed patients were more likely to recover compared to unemployed patients. This finding suggests that employment provides financial stability, enabling patients to meet essential needs during treatment, such as adequate nutrition and transportation to healthcare facilities. In addition, being employed may reflect a higher level of responsibility and self-discipline, which contributes to better adherence to long-term TB treatment.⁶ This result is consistent with previous studies indicating better adherence to long-term TB treatment. This result is consistent with previous studies indicating that unemployed respondents are more likely to be non-adherent to TB treatment due to economic constraints and limited access to healthcare services.^{1,6,7}

In contrast, income did not show a significant effect on recovery ($p=0.519$), although descriptively, patients with higher income tended to have better outcomes. This finding may be explained by the implementation of the DOTS strategy, which provides free TB treatment, thereby reducing financial barriers. As result, both low- and high-income patients have relatively equal access to treatment

services. However, income may still indirectly influence recovery through factors such as nutritional status and living conditions, which are not fully captured in this study.^{1,8}

Regarding individual factors, age was found to significantly affect TB recovery (0.043). Patients in the adolescent and adult groups, showed better recovery outcomes compared to elderly patients. This can be explained biologically, as younger respondents generally have stronger immune systems and better physiological responses to infection. In addition, respondents in the productive age tend to have better cognitive ability and motivation to adhere to treatment regimens. Conversely, elderly patients often experience decreased immunity, comorbidities, and physical limitations, which may hinder the recovery process.⁹ These findings are consistent with previous studies highlighting that older age is associated with poorer TB treatment outcomes.^{10,11}

Treatment history also demonstrated a significant effect on recovery (0.011). Patients with new TB cases were more likely to recover compared to those with previous treatment history. This finding can be attributed to the higher risk of drug resistance and previous non-adherence among patients with recurrent TB. Patients who have experienced treatment interruption or failure are more likely to develop resistance to anti-tuberculosis drugs (OAT), leading to reduced treatment effectiveness.¹² Therefore, patients with a history of TB require closer monitoring and more intensive support to ensure successful treatment outcomes.^{6,13}

Among external factors, family support was identified as the most dominant determinant of TB recovery. Patients who received family support showed significantly higher recovery rates compared to those without support ($p=0.003$). Family support plays a crucial role in providing emotional encouragement, reminding patients to take medication, assisting with healthcare access, and ensuring adequate nutrition.¹⁴ This comprehensive support system enhances patient motivation and adherence to treatment. The findings reinforce the importance of family involvement in TB management, as family members often act as primary caregivers throughout the treatment process.^{15,16}

On the other hand, the role of PMO did not show a significant effect on recovery ($p=1.00$), despite most respondents having supportive PMOs. This may be due to the homogeneity of the data, where the majority of respondents already had adequate PMO support, resulting in limited variability. Additionally, the role of PMO may be more focused on monitoring medication intake, whereas broader aspects of support, such as emotional and social support, are more effectively provided by family members.¹⁷ Similar findings have been reported in previous studies showing no significant relationship between PMO presence and TB recovery.¹⁸

Similarly, the role of healthcare workers were not significantly effects with recovery ($p=0.112$). Although most respondents reported good healthcare services, the lack of variability may have influenced the statistical results. Furthermore, while healthcare workers play a critical role in diagnosis, treatment provision, and education, patient-related factors such as adherence and family support appear to have a more direct impact on recovery outcomes.¹⁹

Overall, this study highlights that TB recovery is a multifactorial process influenced by various interacting determinants. Among all factors examined, family support emerged as the most dominant determinant, emphasizing the importance of strengthening family-based interventions in TB control programs. In addition, targeted strategies should be developed for high-risk groups, particularly elderly patients and those with previous treatment history, to improve treatment success rates.

CONCLUSIONS

This study concludes that TB recovery is significantly influenced by employment, age, treatment history and family support. Family support was identified as the most dominant factor. Meanwhile, income, PMO role and healthcare worker's role were not significantly effects with the recovery of TB. Strengthening family-based interventions and targeted support for high-risk group such as elderly and previously treated patients is essential to improve TB treatment outcomes.

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