



# The Role of Nurses in Improving Adherence to Taking Medication in Tuberculosis Patients

Grace Carol Sipasulta<sup>1\*</sup>, & Rus Andraini<sup>2</sup>

<sup>1</sup>Politeknik Kesehatan Kemenkes Kalimantan Timur, Indonesia, <sup>2</sup>Politeknik Kesehatan Kemenkes Kalimantan Timur, Indonesia

\*Co e-mail: [gracecst64@gmail.com](mailto:gracecst64@gmail.com)<sup>1</sup>

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## ABSTRACT

*Tuberculosis (TB) remains a significant global health threat, especially in Indonesia, which has one of the highest incidence rates. Effective treatment adherence is essential for controlling the disease. This study aimed to explore the relationship between the role of nurses and patient adherence in TB treatment, taking into account various social and economic factors. Methods Using a quantitative cross-sectional design, data were collected from 41 TB patients and nurses at Pondok Meja Health Center through the Morisky Medication Adherence Scale (MMAS-8) and semi-structured interviews. Data were analyzed using univariate statistical test, and bivariate with chi-square test. The results showed a strong correlation between patient adherence and the role of nurses as educators and motivators. Providing active education had a p-value of 0.002, while regular reminders had a p-value of 0.001. It can be concluded that the role of nurses in education, routine reminders, communication with families, and home visits have a significant relationship with the level of adherence of TB patients. Socioeconomic factors such as family support, access to health services, and economic conditions also play an important role in improving patient compliance.*

**Keywords:** Tuberculosis (TB), Treatment Adherence, Nurse

## INTRODUCTION

As an infectious disease that continues to pose a threat to global health, tuberculosis (TB) has a high incidence in many countries, including Indonesia. The World Health Organization (WHO) reported that Indonesia had the second highest number of pulmonary TB infections in the world in 2020, after India (WHO, 2021). Mycobacterium tuberculosis is the causative agent of tuberculosis (TB), an infectious disease that affects the lungs as well as other organs such as the glands, bones and skin. Patient adherence to treatment is one of the biggest problems in TB management. The



disease is transmitted when a person with tuberculosis (TB) coughs or sneezes, then other people breathe in droplets containing TB bacteria (Wahdi, 2021). Ineffective adherence can increase the risk of transmission, prolong the treatment period, and result in drug resistance (Mishra et al., 2020). Nurses have an important role to play in this situation, not only in providing medication to patients but also in educating, encouraging, and supporting them to follow the treatment plan.

The number of cured and fully treated TB cases among all treated and reported TB cases is known as the treatment success rate; hence, it is the total of the cure and complete treatment rates of all cases. With a treatment success rate of at least 90% for all TB cases, this indicates the quality of TB services (Ministry of Health of the Republic of Indonesia, 2023.) In 2020, 10 provinces achieved a TB treatment success rate of at least 90%. These provinces include Lampung (96.7%), South Sumatra (94.5%), West Sulawesi (93.6%), Central Sulawesi (93.1%), Riau (92.0%), Jambi (90.7%), East Kalimantan (90.5%), Bangka Belitung Islands (90.2%), West Nusa Tenggara (90.1%), and North Sumatra (90.0%) (Indonesian Ministry of Health, 2021).

Previous studies have shown that nurses have a very important role in improving the treatment adherence of TB patients. Based on research by Indasari et al. (2018), individuals with pulmonary TB who were accompanied by a nurse had a greater role in drug adherence. Similarly, Gunawan and Jaysendra (2020) found a strong relationship between TB patients' medication adherence and nurses' roles as educators and motivators. In addition to the role of nurses, various studies have also shown that TB patient compliance is influenced by other factors such as family support, socioeconomic conditions, access to health facilities, and the level of patient knowledge about their disease. A study conducted by Putri et al. (2019) found that TB patients who received family support were more consistent in undergoing therapy compared to patients who did not receive support. This is in line with the findings of Rahayu and Surya (2021), which show that economic factors and accessibility to health facilities are the main obstacles to patient compliance with TB treatment. However, previous studies have not comprehensively explored the interaction between the role of nurses and other factors in improving TB patient adherence, so further research is needed to understand the specific mechanisms that contribute to successful TB therapy.

Based on a gap analysis of previous studies, this study aims to further explore how the role of the nurse can improve TB patient adherence to treatment, taking into account social, economic and environmental factors that may influence the effectiveness of the role. By examining the relationship between the nurse's role and other enabling factors, this study aims to provide a more comprehensive insight into strategies that can be used to improve patient adherence to TB therapy. The novelty of this study lies in the holistic approach that not only highlights the nurse's role as a healthcare provider but also explores external factors that influence patient adherence, thus providing more effective recommendations in improving TB treatment success rates.

## **METHODS**

This study uses a quantitative approach with a cross-sectional design to explore the relationship between the role of nurses and patient compliance in undergoing tuberculosis (TB) treatment. The subjects of the study were pulmonary TB patients undergoing treatment at the



Pondok Meja Health Center and nurses who handled TB patients. The research sample consisted of 41 TB patients selected using a purposive sampling technique based on inclusion criteria, namely patients who have undergone treatment for at least two months and nurses with at least one year of experience in handling TB patients. Data collection was conducted through the Morisky Medication Adherence Scale (MMAS-8) questionnaire to measure patient compliance, as well as semi-structured interviews to explore the role of nurses in patient education and motivation. Data analysis uses univariate statistical tests, and bivariate with chi-square tests.

## RESULTS

### 1. Characteristics of Respondents

The characteristics of respondents consisting of age, gender, education, employment status, length of treatment, and family support are presented in Table 1 as follows:

**Table 1. Characteristics of Respondents**

Characteristics	Frequency (n)	Percentage (%)
<b>Age</b>		
<30 years old	10	24,4
30-50 years old	15	36,6
>50 years old	16	39,0
<b>Gender</b>		
Male	25	61,0
Female	16	39,0
<b>Education</b>		
Elementary	8	19,5
Junior High	12	29,3
High School	15	36,6
Higher Education	6	14,6
<b>Employment Status</b>		
Employed	23	56,1
Not Employed	18	43,9
<b>Duration of Treatment</b>		
2-4 months	14	34,1
5-6 months	27	65,9

Respondent characteristics showed that the majority were aged >50 years (39.0%), male (61.0%), and had a high school education (36.6%). Most respondents were employed (56.1%) and had undergone treatment for 5–6 months (65.9%). This illustrates that respondents were predominantly elderly, male, had secondary education, were employed, and had undergone treatment for a relatively long duration.

## 2. Compliance of TB Patients in Undergoing Treatment

Measurement of patient adherence to treatment was conducted using the Morisky Medication Adherence Scale (MMAS-8) questionnaire. The results of the distribution of TB patient compliance are as follows:

**Table 2. TB Patient Adherence to Treatment**

Compliance	Frequency (n)	Percentage (%)
High	20	48,8
Medium	12	29,3
Low	9	22,0

The results of measuring TB patient compliance using the MMAS-8 questionnaire showed that the majority of respondents had a high level of compliance, namely 20 people (48.8%). Furthermore, 12 people (29.3%) had moderate compliance, and 9 people (22.0%) had low compliance. This indicates that the majority of patients already have good compliance with their treatment, although some still need to improve their compliance.

## 3. Nurses' Role in Educating and Motivating TB Patients

The role of nurses in providing education and motivation to TB patients was also explored through semi-structured interviews. The following are the results:

**Table 3. Nurses' Role in Educating and Motivating TB Patients**

Nurse's role	Frequency (n)	Percentage (%)
Provide active education	30	73,2
Remind patients regularly	35	85,4
Communicating with the patient's family	28	68,3
Conducting home visits	22	53,7

The table shows that the role of nurses in providing education and motivation to TB patients is quite optimal. The majority of nurses actively remind patients regularly (85.4%), followed by providing active education (73.2%), and communicating with patients' families (68.3%). However, home visits are still relatively low (53.7%). This indicates that nurses' role is more dominant in communication and reminders, while direct approaches through home visits still need improvement.

## 4. Relationship Between Nurses' Role and Patient Compliance

To determine the relationship between the role of nurses and TB patient compliance, bivariate analysis was conducted using the chi-square test. The results are as follows:

**Table 4. Relationship Between Nurses' Roles and TB Patient Adherence**

Role of Nurses	High Compliance	Low Compliance	p-value
Active in education	18 (60,0%)	2 (10,0%)	0,002
Reminding patients regularly	19 (54,3%)	1 (5,7%)	0,001
Communicating with family	16 (57,1%)	3 (12,9%)	0,005



Making home visits	12 (54,5%)	3 (13,6%)	0,008
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Bivariate analysis showed a significant relationship between the role of nurses and TB patient compliance (p-value <0.05). Nurses' active role in providing education (p=0.002), routinely reminding patients (p=0.001), communicating with families (p=0.005), and conducting home visits (p=0.008) were all associated with higher levels of compliance. This suggests that the more optimal the nurse's role, the higher the patient's compliance in undergoing TB treatment.

### 5. Other Factors Affecting TB Patient Compliance

In addition to the role of nurses, this study also explored external factors that may influence patient adherence to TB therapy. The following are the main findings:

**Table 5. Socioeconomic Factors Affecting TB Patient Compliance**

Role of Nurses	High Compliance	Low Compliance	p-value
Good family support	17 (58,6%)	3 (10,3%)	0,003
Access to good health facilities	15 (51,7%)	4 (13,8%)	0,007
Stable economic conditions	14 (50,0%)	5 (17,2%)	0,009

The results of this table indicate that socioeconomic factors have a significant relationship with TB patient adherence (p-value <0.05). Good family support (p=0.003), good access to health facilities (p=0.007), and a stable economic condition (p=0.009) are associated with higher levels of adherence. This indicates that in addition to the role of nurses, external factors also play an important role in improving patient adherence to TB therapy.

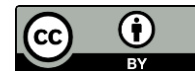
## DISCUSSION

The results of this study show that the compliance of tuberculosis (TB) patients in undergoing treatment is influenced by several factors, including the role of nurses in providing education and motivation, as well as socio-economic factors such as family support, access to health facilities, and economic conditions.

### 1. Respondent Characteristics and TB Treatment Compliance

The results showed that most of the respondents were over 50 years old (39.0%), followed by the age group of 30-50 years (36.6%) and <30 years (24.4%). The age factor plays a role in TB treatment adherence because older individuals tend to have higher health awareness compared to younger age groups (World Health Organization, 2021). In addition, the majority of respondents were men (61.0%), which is in line with previous research showing that the prevalence of TB is higher in men than women due to social factors and work that are more often exposed to unhealthy environments (Sulis et al., 2020).

In terms of education, the majority of respondents have a high school education (36.6%), followed by junior high school (29.3%), elementary school (19.5%), and college (14.6%). Education plays a role in patients' understanding of the importance of medication compliance, as stated by Fitri et al. (2019) that patients with higher levels of education tend to have better levels of compliance. Employment status showed that 56.1% of respondents were employed and 43.9% were not employed. Work can affect adherence to therapy due to busyness factors and access to health



facilities (Munro et al., 2007). Age and education factors play a role in medication adherence, as stated in a study by Alipanah et al. (2018). Most of the respondents had been on treatment for 5-6 months (65.9%), which indicates that the majority of patients have been in an advanced phase of TB therapy.

## **2. Compliance of TB Patients in Undergoing Treatment**

According to recent studies, the level of compliance among tuberculosis (TB) patients undergoing treatment varies significantly. A study by Tyas et al. (2022) reported that 12.3% of TB patients had a low level of compliance. Meanwhile, research by Amalya (2020) found that 89% of patients exhibited high compliance in taking anti-tuberculosis drugs (OAT), which showed that psychosocial factors and patient motivation play a significant role in adherence to TB treatment. According to the Health Belief Model (HBM) theory, adherence is influenced by the individual's perception of the benefits of treatment and the consequences of non-compliance (Rosenstock, 1974). In addition, a study by Barik et al. (2020), which identified that factors such as knowledge about TB, motivation, and social support play an important role in determining patient compliance levels.

## **3. The Role of Nurses in the Education and Motivation of TB Patients**

The findings showed that the majority of nurses were active in providing education (73.2%), routinely reminding patients (85.4%), communicating with patients' families (68.3%), and making home visits (53.7%). These findings are in line with a study by Yuliana et al. (2019), which showed that the role of nurses in providing education and routine monitoring increased the compliance rate of TB patients by up to 60%. Communicating with patients' families (68.3%) and conducting home visits (53.7%) also contribute to supporting patient compliance. A study by Rahman et al. (2022) confirms that family-based approaches and home visits can improve patients' understanding of the importance of treatment.

## **4. Relationship Between Nurse Role and TB Patient Compliance**

Bivariate analysis showed a significant relationship between the role of nurses and the compliance of TB patients. Active education has a p-value of 0.002, while routine reminders have a p-value of 0.001. These results show that the more active nurses are in providing education and reminders, the higher the level of patient compliance. According to research conducted by Wijayanti et al. (2020), therapeutic communication strategies by nurses can increase patient motivation to complete TB therapy. In addition, a study conducted by White et al. (2015), which stated that nurse interventions involving education and psychosocial support significantly improved TB patient compliance.

## **5. Socioeconomic Factors Affecting TB Patient Compliance**

In addition to the role of nurses, socioeconomic factors also affect patient compliance. Good family support has a significant association with high adherence (p-value 0.003), in line with a study by Handayani et al. (2023), which found that emotional support from family helps patients in



completing treatment. Access to good health facilities (p-value 0.007) and stable economic conditions (p-value 0.009) are also important factors. According to research by Kusuma & Wahyuni (2021), patients with easy access to health services are more likely to complete their therapy. In addition, stable economic conditions allow patients to acquire drugs regularly without cost barriers.

## CONCLUSIONS

This study can conclude that the role of nurses in education, routine reminders, communication with families, and home visits has a significant relationship with the level of compliance of TB patients. Socioeconomic factors such as family support, access to health services, and economic conditions also play an important role in improving patient compliance. It is hoped that the results of this study can be the basis for policy development in increasing the effectiveness of the role of nurses and improving the support system for TB patients. Further studies can explore more in-depth community-based interventions as well as the long-term impact of healthcare workers' involvement in the management of TB patients. In addition, further research may also consider psychosocial and cultural factors that may influence patient adherence to TB therapy.

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