

Determinants of Compliance with Lawrence Green Theory-Based Leprosy Treatment in Leprosy Patients in Sarmi Regency, Papua Province

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ABSTRACT

Leprosy is a chronic infectious disease that requires high adherence to multidrug therapy (MDT) to prevent further complications and transmission. However, the level of patient compliance in undergoing treatment is still a challenge, especially in areas with limited access such as Sarmi Regency, Papua Province. This study aims to analyze the determinants of leprosy treatment adherence based on Lawrence Green's theory, which includes predisposition, enabling, and reinforcing factors. This study uses a quantitative method with the Partial Least Squares - Structural Equation Modeling (PLS-SEM) approach. Data was collected through a questionnaire given to 100 respondents with leprosy in Sarmi Regency. The results of the analysis showed that predisposing factors (knowledge, attitudes, and beliefs) had a significant effect on treatment adherence with a pathway coefficient of 0.434 and a T-Statistic of 12.635. The enabling factor also had a significant effect with a path coefficient of 0.576 and a T-Statistic of 2.87, which shows that the better the access to health services, the higher the patient compliance rate. The reinforcing factor, which includes social support from families and health workers, has a pathway coefficient of 0.250 and a T-Statistic of 3.624, which means that the stronger the support the patient receives, the higher their compliance rate. These findings show that improving patient adherence to leprosy treatment can be achieved through educational strategies that increase patient understanding, improve access to health services, and optimize social support from families and medical personnel. Therefore, community-based interventions and health policies that support ease of access and sustainable education are needed to increase the effectiveness of leprosy treatment in Sarmi Regency.

Keywords: Medication adherence, leprosy, lawrence green's theory

Received March 7, 2026; Revised April 12, 2026; Accepted May 5, 2026



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BACKGROUND

Leprosy remains one of the chronic infectious diseases that continues to pose a public health problem in various regions worldwide, including Indonesia (Maruli, 2020). The disease is caused by *Mycobacterium leprae* and may result in multidimensional impacts, not only in medical aspects but also in social, economic, cultural, and even national resilience dimensions. Although effective treatment in the form of Multi Drug Therapy (MDT) has been widely available, the level of treatment adherence among patients remains low, particularly in remote areas such as Sarmi Regency, Papua Province. In 2023, this region was categorized as a leprosy-endemic area, with the number of new cases reaching approximately 300–500 cases (Papua Health Office, 2023).

Low adherence to leprosy treatment in Sarmi Regency is influenced by various factors, including feelings of shame, social stigma, limited access to healthcare facilities, and inadequate knowledge and family support for patients (Fitriani, 2011). Some patients still perceive leprosy as a non-dangerous disease that can heal spontaneously without medical treatment. This condition contributes to delays in treatment, thereby increasing the risk of disability and transmission to people surrounding the patients. Data from the World Health Organization (WHO) indicate that globally there are approximately 5.5 million leprosy cases, and Indonesia remains one of the five countries with the highest burden of leprosy cases, reporting 13,487 new cases in 2022 (World Health Organization, 2023).

Lawrence Green's theory explains that individual health behavior is influenced by three main factors, namely predisposing, enabling, and reinforcing factors. Predisposing factors include individual knowledge, attitudes, and beliefs regarding the disease and its treatment. Enabling factors involve the availability of and access to healthcare facilities, while reinforcing factors include social support from family members and healthcare providers (Setyowati, 2020). The absence of these elements may become determinants of poor treatment adherence among patients with leprosy, particularly in areas with limited infrastructure and low public health literacy (Ghazali et al., 2023).

The primary objectives of leprosy treatment are to interrupt the chain of transmission, cure the disease, and prevent as well as reduce disability. Efforts to improve treatment adherence are therefore essential to ensure the success of MDT therapy. Consequently, a comprehensive approach based on health behavior theory is required to explore the determinants influencing adherence to leprosy treatment (Martina et al., 2021). This study was conducted to identify the influence of predisposing factors, enabling factors, and reinforcing factors on adherence to leprosy treatment based on Lawrence Green's theory among leprosy patients in Sarmi Regency, Papua Province.

METHODS

This study employed a quantitative approach with a cross-sectional observational design aimed at identifying the relationship between various factors based on Lawrence Green's theory and treatment adherence among leprosy patients in Sarmi Regency, Papua Province. The study was conducted at a single point in time, specifically in July 2024, by measuring independent variables including knowledge, attitudes, beliefs, availability of healthcare facilities, access to healthcare services, family support, and healthcare worker support, while the dependent variable was adherence to leprosy treatment.

The population of this study consisted of all leprosy patients actively undergoing Multi Drug Therapy (MDT) within the working area of Betaf Public Health Center, totaling 100 patients. The inclusion criteria included patients residing in Sarmi Regency, willing to participate as respondents, and having been diagnosed with leprosy by a physician. Meanwhile, the exclusion criteria comprised infants, children, elderly patients with dementia, and patients

with decreased consciousness. Since the population size was equal to the sample size, the sampling technique applied was total sampling (census), in which all members of the population were included as respondents to ensure equal participation opportunities for the entire population (Suriani et al., 2023).

The research instrument consisted of a questionnaire that had been tested for validity using the product moment correlation test and for reliability using Cronbach's alpha test. Questionnaire items were considered valid when the calculated r value exceeded the r table value and considered reliable when the alpha coefficient (α) was greater than 0.6. Data collection was conducted directly by the researchers through the distribution of questionnaires to patients who met the inclusion criteria, after obtaining approval from the relevant institutions and informed consent from respondents (Pebrina & Alissa, 2022).

Data processing procedures included editing, coding, scoring, and tabulation stages. Data analysis consisted of descriptive analysis to describe the frequency distribution and percentage of each variable, as well as inferential analysis using the Partial Least Square (PLS) method to evaluate the outer model (convergent validity, discriminant validity, Average Variance Extracted [AVE], and composite reliability) and the inner model (relationships among variables, R-Square, and Q-Square). Hypothesis testing was performed using the t -statistical test to determine the significance of the relationships among variables.

RESULTS

a. Respondents' Age

Table 4.1. Frequency Distribution of Respondents' Age

Age	Frequency (f)	Percentage (%)	Homogeneity Test
12–25 years	45	45	$p \geq 0.05$
26–45 years	33	33	$p = 0.538$
46–65 years	22	22	
Total Respondents	100	100	

Based on the frequency distribution analysis of respondents' age in this study, most respondents were in the 12–25 years age group, totalling 45 individuals (45%), followed by the 26–45 years age group with 33 individuals (33%), and the 46–65 years age group with 22 individuals (22%). This proportion indicates that most leprosy patients involved in this study belonged to the younger age category. The homogeneity test showed a p -value of 0.538, which was greater than 0.05, indicating that the variance of age data in this study was homogeneous. This homogeneity suggests that the age distribution of respondents did not demonstrate significant differences that could statistically affect the study results.

b. Respondents' Gender

Table 4.2. Frequency Distribution of Respondents' Gender

Gender	Frequency (f)	Percentage (%)	Homogeneity Test
Female	37	37.0	$p \geq 0.05$
Male	63	63.0	$p = 0.443$
Total Respondents	100	100	

Based on the frequency distribution analysis of respondents' gender, most respondents were male, accounting for 63 individuals (63%), while female respondents totalled 37 individuals (37%). This finding indicates that leprosy patients in this study were predominantly male. The homogeneity test yielded a p -value of 0.443, which was greater than 0.05, indicating that the gender distribution in this study was homogeneous. This homogeneity implies that the difference in the number of male and female respondents did not produce significant variability in the study findings.

c. Validity Test Results

Table 4.3. Outer Loading Test Results

Variable	Indicator	Outer Loading	Description
X1	Knowledge	0.720	Valid
	Attitude	0.696	Valid
	Belief	0.622	Valid
X2	Availability of Facilities	0.865	Valid
	Access to Healthcare Facilities	0.875	Valid
	Government Support	0.895	Valid
X3	Family Support	0.837	Valid
	Occupation	0.813	Valid
	Healthcare Worker Support	0.607	Valid
Y	Adherence to Leprosy Treatment	1.000	Valid

The results of the outer loading test demonstrated that all indicators had loading factor values above the acceptable threshold, indicating that each indicator was valid in measuring its respective construct. Therefore, all indicators included in this study met the validity requirements and were suitable for further analysis.

d. Reliability Test Results

Table 4.4. Reliability Test Results

Variable	Cronbach's Alpha	AVE	Description
X1	0.769	0.624	Reliable
X2	0.861	0.757	Reliable
X3	0.701	0.542	Reliable
Y	1.000	1.000	Reliable

The reliability test results indicated that all variables had Cronbach's Alpha values greater than 0.6 and Average Variance Extracted (AVE) values above 0.5. These findings demonstrate that all research variables possessed good internal consistency and reliability, making them appropriate for use in further statistical analysis.

e. Hypothesis Testing Results

Table 4.5. Hypothesis Testing Results

Relationship	Path Coefficient	Standard Deviation	T-Statistic	Description
Predisposing Factors → Adherence	0.434	0.043	12.635	Significant
Enabling Factors → Adherence	0.576	0.058	0.101	Significant
Reinforcing Factors → Adherence	0.250	0.076	3.624	Significant

The hypothesis testing results showed that predisposing factors, enabling factors, and reinforcing factors had significant effects on adherence to leprosy treatment. Enabling factors demonstrated the strongest influence on treatment adherence, with a path coefficient value of 0.576, followed by predisposing factors (0.434) and reinforcing factors (0.250). These findings indicate that adequate healthcare facilities, accessibility to healthcare services, and supportive environmental factors play important roles in improving adherence to leprosy treatment among patients in Sarmi Regency, Papua Province.

DISCUSSION

The findings of this study indicate that treatment adherence among leprosy patients in Sarmi Regency is strongly influenced by the combination of predisposing, enabling, and reinforcing factors. Predisposing factors, which include patients' knowledge, attitudes, and beliefs, were found to have a significant influence on treatment adherence, with a path coefficient value of 0.434 and a T-statistic of 12.635. Patients who understood the importance of leprosy treatment and were aware of the risks of complications tended to demonstrate greater adherence to Multi Drug Therapy (MDT) (Andriani, 2019). These findings support Lawrence Green's theory, which emphasizes the importance of individual factors in determining health behavior (Candrawati et al., 2023). In addition, family support and perceptions of social stigma also contributed to shaping patients' attitudes toward treatment adherence (Ghazali et al., 2023).

Furthermore, enabling factors emerged as the most dominant variable influencing patient adherence, with the highest path coefficient value of 0.576 and a T-statistic of 10.101. Easy access to healthcare facilities, the availability of healthcare professionals, and government support policies, such as the provision of free medication and healthcare services, played significant roles in facilitating patients to consistently continue their treatment (Kemenkes, 2023). In remote areas such as Sarmi Regency, geographical barriers and limited healthcare infrastructure represent major challenges that may be addressed through innovative approaches, including the utilization of telemedicine technology and SMS reminder systems. Community support through local health cadres also serves as an important driving force in strengthening patients' access to and acceptance of treatment services (Papua Health Office, 2023).

Although its influence was smaller compared to the other factors, support from family members, coworkers, and healthcare workers remained an essential element in strengthening patients' motivation to complete their treatment (Wulandari, 2020). The role of family members in reminding and accompanying patients, as well as direct education provided by healthcare professionals, was proven to improve patients' understanding of and adherence to treatment protocols. However, community practices that remain inadequate in terms of prevention, such as sharing towels with other family members, indicate the need for increased education regarding healthy behaviors in the context of leprosy transmission prevention (Rewa, 2021).

Overall, medication adherence among leprosy patients in Sarmi Regency was influenced by the synergy of these three factors. The success of MDT therapy largely depends on the effectiveness of interventions that integrate educational, structural, and social approaches. Although the majority of patients demonstrated good adherence levels, barriers related to social stigma, remote geographical conditions, and the limited number of healthcare professionals still persist (Anwar & Syahrul, 2019). Therefore, strategies aimed at improving treatment adherence should include the enhancement of healthcare services, strengthening of public health education, and sustainable community empowerment initiatives. These findings highlight the importance of a multidimensional approach in the management of leprosy treatment to ensure that all patients have equal opportunities to recover and to be protected from complications and further disease transmission (Octavia et al., 2024).

Study Limitations

This study has several limitations that should be acknowledged. First, the cross-sectional design used in this study was only able to describe conditions at a single point in time and therefore could not establish causal relationships longitudinally. Second, data collection through questionnaires may have introduced social desirability bias, in which respondents may have tended to provide answers perceived as socially acceptable. Third, this study was

conducted only within the working area of Betaf Public Health Center in Sarmi Regency; therefore, the generalizability of the findings to other regions should be interpreted cautiously, particularly considering the unique geographical and demographic characteristics of Sarmi Regency. Further studies employing longitudinal designs and broader regional coverage are highly recommended to strengthen the validity of these findings.

CONCLUSION

Based on the findings of this study regarding the determinants of leprosy treatment adherence based on Lawrence Green's Theory among leprosy patients in Sarmi Regency, Papua Province, several conclusions can be drawn.

First, predisposing factors, including knowledge, attitudes, and beliefs, had a significant influence on adherence to leprosy treatment, with a path coefficient of 0.434 and a T-statistic value of 12.635. This indicates that the better the patients' knowledge, attitudes, and beliefs regarding leprosy, the higher their level of adherence to treatment.

Second, enabling factors, consisting of the availability of healthcare facilities, access to healthcare services, and government support, had a significant effect on treatment adherence, with a path coefficient of 0.576 and a T-statistic value of 10.101. These findings demonstrate that enabling factors were the most dominant determinants identified in this study.

Third, reinforcing factors, including family support and support from healthcare workers, also had a significant effect on treatment adherence, with a path coefficient of 0.250 and a T-statistic value of 3.624. This suggests that greater social support received by patients increases their motivation to complete the treatment process.

Recommendations

Based on the study findings, several recommendations are proposed. For Public Health Centers (Puskesmas), considering that enabling factors were identified as the most dominant determinants, it is recommended to improve the accessibility of leprosy treatment services by reducing patients' travel burden through home visit programs and the utilization of telemedicine technology, as well as ensuring the consistent availability of MDT medication. Since predisposing factors also showed a significant influence, regular health education regarding leprosy should be strengthened to improve patients' knowledge, attitudes, and beliefs. To reinforce reinforcing factors, family involvement in supporting and accompanying patients throughout the treatment process should be optimized. Early detection activities, such as Rapid Village Surveys and contact examinations, should also continue to be implemented.

For the community, it is expected that individuals become more active in early detection efforts and immediately undergo MDT treatment if diagnosed with leprosy, while also adopting preventive behaviors such as avoiding the sharing of towels and clothing with others.

For future researchers, it is recommended to expand the scope of the study using longitudinal research designs and to investigate additional factors, such as BCG vaccination status and economic conditions, that may influence adherence to leprosy treatment.

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