

## Relationship Between Family Support and Medication Adherence Among Patients with Pulmonary Tuberculosis at Menteng Community Health Center, Palangka Raya City

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### ABSTRACT/ ABSTRAK

**ABSTRACT.** Pulmonary tuberculosis remains a health problem that requires patients to adhere to their treatment. Family support is one of the factors that may help patients throughout the treatment process. This study aimed to analyze the relationship between family support and medication adherence among patients with pulmonary tuberculosis at Menteng Community Health Center, Palangka Raya City. This study used a correlational design with a cross-sectional approach. The sample consisted of 32 patients with pulmonary tuberculosis who were selected using purposive sampling. Data were collected using a family support questionnaire and the Morisky Medication Adherence Scale (MMAS-8), and were subsequently analyzed using univariate and bivariate analyses with the Chi-square test at a significance level of  $\alpha = 0.05$ . The results showed that 31 respondents (96.9%) had high family support, whereas 1 respondent (3.1%) had low family support. A total of 19 respondents (59.4%) were adherent to their medication, while 13 respondents (40.6%) were non-adherent. The Chi-square test showed a  $p$ -value = 0.406 ( $p > 0.05$ ), indicating that there was no statistically significant relationship between family support and medication adherence.

**ABSTRAK.** Tuberkulosis paru masih menjadi masalah kesehatan yang memerlukan kepatuhan pasien dalam menjalani pengobatan. Dukungan keluarga merupakan salah satu faktor yang dapat membantu pasien selama proses pengobatan. Penelitian ini bertujuan menganalisis hubungan dukungan keluarga dengan kepatuhan minum obat pada pasien tuberkulosis paru di Puskesmas Menteng Kota Palangka Raya. Penelitian ini menggunakan desain korelasional dengan pendekatan cross-sectional. Sampel terdiri dari 32 pasien tuberkulosis paru yang dipilih menggunakan purposive sampling. Data dikumpulkan menggunakan kuesioner dukungan keluarga dan Morisky Medication Adherence Scale (MMAS-8), kemudian dianalisis secara univariat dan bivariat menggunakan uji Chi-Square dengan tingkat signifikansi  $\alpha = 0,05$ . Hasil penelitian menunjukkan 31 responden (96,9%) memiliki dukungan keluarga tinggi, sedangkan 1 responden (3,1%) memiliki dukungan keluarga rendah. Sebanyak 19 responden (59,4%) patuh minum obat dan 13 responden (40,6%) tidak patuh. Hasil uji Chi-Square menunjukkan  $p$ -value = 0,406 ( $p > 0,05$ ), sehingga tidak terdapat hubungan yang signifikan antara dukungan keluarga dan kepatuhan minum obat.

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## INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* and remains a global public health problem, with disease burden varying across regions and population groups (Popović Grle et al., 2013; Parveen & Sahai, 2020; Ugarte-Gil, 2026). This burden is not only related to the presence of the disease but also to comorbid conditions and risk factors that may complicate TB control and management (Popović Grle et al., 2013). This condition places treatment continuity as an important component of patient management because patients are required to follow the prescribed treatment regimen in accordance with established treatment guidelines.

During the treatment process, the support received by patients has become an important aspect widely discussed in research on medication adherence. Family and social support have been reported to be associated with treatment adherence among patients with TB (Jang & Lee, 2022; Kusbandia et al., 2025; Chen et al., 2020; Nirmal et al., 2022; Adisa & Durojaye, 2025). Such support may include various forms of assistance provided to patients throughout treatment. In addition to family and social support, support provided through the healthcare system has also been examined in relation to treatment continuity and treatment completion (Khan et al., 2011; Dueñes & Cardona, 2016). Education and counseling have also been investigated as approaches in the context of TB treatment (M'imunya et al., 2012).

Various studies have shown that TB treatment adherence is not only associated with patient characteristics but also with the support environment throughout the treatment process. Patient-centered approaches, including education and counseling, have been investigated in relation to medication adherence and treatment outcomes (Cocozza et al., 2020; Chen et al., 2019; Khan et al., 2011). On the other hand, family and social support, including financial, informational, and emotional support, have also been examined in relation to medication adherence among patients with TB (Jang & Lee, 2022; Kusbandia et al., 2025; Nindrea et al., 2025). Technology-based interventions and mHealth have also been used as complementary approaches to support treatment adherence through reminders and monitoring (Jerene et al., 2025; Kafie et al., 2024; Santra et al., 2021). Thus, TB treatment adherence can be understood within a broader context through interactions among patients, families, social environments, and healthcare services.

Nevertheless, the relationship between family support and medication adherence needs to be understood within the context of each study. Studies on family or social support and medication adherence have been conducted in different populations and healthcare settings (Jang & Lee, 2022; Kusbandia et al., 2025; Nindrea et al., 2025; Zeng et al., 2024). Differences in patient characteristics, healthcare settings, and forms of support received may produce different patterns of association. Therefore, research at the primary healthcare level is needed to obtain empirical evidence regarding the relationship between family support and medication adherence in specific populations. This focus is important because family support is one form of support received by patients during treatment, while the treatment process may also be influenced by other forms of support (Cocozza et al., 2020; Jang & Lee, 2022).

This context is relevant to the conditions at Menteng Community Health Center, Palangka Raya City, which provides healthcare services to patients with pulmonary tuberculosis. Based on the preliminary survey underlying this study, some patients were still found to be non-adherent to their medication, with factors including forgetting to take

medication, medication side effects, and inadequate family support. These conditions provided the basis for examining the relationship between family support and medication adherence among patients with pulmonary TB receiving care at Menteng Community Health Center, Palangka Raya City.

In this study, family support is defined as the support received by patients during TB treatment. Family support may include emotional, informational, instrumental, and appraisal support. However, this study did not examine the relationship between each of these dimensions and medication adherence separately. The analysis focused on family support as a whole. Medication adherence was measured using the Morisky Medication Adherence Scale (MMAS-8), which has been used in studies assessing medication adherence (De las Cuevas & Peñate, 2015; Okello et al., 2016; Zhang et al., 2021). This limitation was necessary to ensure that the analysis remained consistent with the variables measured and did not assume that family support was the only factor associated with medication adherence.

Based on this background, this study aimed to analyze the association between family support and medication adherence among patients with pulmonary tuberculosis at Menteng Community Health Center, Palangka Raya City.

## RESEARCH METHOD

This study used a correlational design with a cross-sectional approach to analyze the relationship between family support and medication adherence among patients with pulmonary tuberculosis at Menteng Community Health Center, Palangka Raya City. The study involved 32 respondents who were patients with pulmonary tuberculosis receiving healthcare services at Menteng Community Health Center, Palangka Raya City. Respondents were selected using purposive sampling, which involved selecting participants based on characteristics relevant to the objectives of the study.

The study involved two main variables, namely family support and medication adherence. Family support was analyzed as a single variable as a whole, whereas medication adherence was the variable observed among patients with pulmonary tuberculosis. Data were collected using a family support questionnaire and the *Morisky Medication Adherence Scale* (MMAS-8). The family support questionnaire was used to identify the level of family support received by patients during TB treatment and was categorized as high or low family support. Medication adherence was measured using the MMAS-8 and categorized as adherent or non-adherent. The use of the MMAS-8 for assessing medication adherence has been examined in various research contexts.

Data obtained from the family support questionnaire and MMAS-8 were subsequently analyzed using univariate and bivariate analyses. Univariate analysis was used to describe the distribution of each variable in terms of frequency and percentage. Bivariate analysis was conducted to examine the relationship between family support and medication adherence using the Chi-square test at a significance level of  $\alpha = 0.05$ . A  $p$ -value  $< 0.05$  indicated a statistically significant relationship, whereas a  $p$ -value  $> 0.05$  indicated no statistically significant relationship at the specified significance level.

Ethical considerations were applied throughout the research process. The identities of the respondents were kept confidential, and the data obtained were used for research purposes. Respondents participated voluntarily in accordance with applicable research ethics requirements.

## RESULTS

This study involved 32 respondents with pulmonary tuberculosis who were undergoing treatment at Menteng Community Health Center, Palangka Raya City. The results are presented descriptively to describe the distribution of family support and medication adherence, followed by bivariate analysis to examine the relationship between the two variables.

**Table 1. Identification of Family Support Among Patients with Pulmonary Tuberculosis**

| Family Support | Frequency (n) | Percentage (%) |
|----------------|---------------|----------------|
| High           | 31            | 96.9           |
| Low            | 1             | 3.1            |
| Total          | 32            | 100.0          |

Based on Table 1, of the 32 respondents, 31 respondents (96.9%) had high family support, whereas 1 respondent (3.1%) had low family support. Thus, most respondents in this study received a high level of family support.

**Table 2. Identification of Medication Adherence Among Patients with Pulmonary Tuberculosis**

| Medication Adherence | Frequency (n) | Percentage (%) |
|----------------------|---------------|----------------|
| Adherent             | 19            | 59.4           |
| Non-adherent         | 13            | 40.6           |
| Total                | 32            | 100.0          |

Based on Table 2, 19 respondents (59.4%) were categorized as adherent to their medication, whereas 13 respondents (40.6%) were categorized as non-adherent. Thus, the adherent category was the most frequently observed category in this study.

**Table 3. Analysis of the Relationship Between Family Support and Medication Adherence Among Patients with Pulmonary Tuberculosis**

| Family Support | Medication Adherence |      |              |       | Total |       | p-value | RR (95% CI)         |
|----------------|----------------------|------|--------------|-------|-------|-------|---------|---------------------|
|                | Adherent             |      | Non-adherent |       |       |       |         |                     |
|                | n                    | %    | n            | %     | n     | %     |         |                     |
| Low            | 0                    | 0.0  | 1            | 100.0 | 1     | 100   | 0.406   | 0.387 (0.249–0.603) |
| High           | 19                   | 61.3 | 12           | 38.7  | 31    | 100   |         |                     |
| Total          | 19                   | 59.4 | 13           | 40.6  | 32    | 100.0 |         |                     |

Based on Table 3, among respondents with high family support, 19 respondents (61.3%) were categorized as adherent to their medication, whereas 12 respondents (38.7%) were categorized as non-adherent. Among respondents with low family support, there was 1 respondent, who was categorized as non-adherent to medication (100.0%).

The Chi-square test showed a *p*-value of 0.406. This value was higher than the predetermined significance level of  $\alpha = 0.05$ . Thus, the analysis showed no statistically

significant relationship between family support and medication adherence among patients with pulmonary tuberculosis at Menteng Community Health Center, Palangka Raya City.

Descriptively, the proportion of respondents who were adherent to their medication in the high family support group was 61.3%, whereas there were no respondents categorized as adherent in the low family support group. Conversely, the only respondent with low family support was categorized as non-adherent. Although there was a descriptive difference in the distribution between the two family support categories, the statistical test did not indicate a significant relationship between the two variables ( $p = 0.406$ ).

The distribution of respondents according to family support showed that most respondents were in the high family support category, comprising 31 of 32 respondents (96.9%), whereas the low family support category consisted of only 1 respondent (3.1%). This condition indicates that the distribution of the family support variable in this study was highly concentrated in one category. Therefore, the relationship between family support and medication adherence should be interpreted by considering the limited variation in the distribution of respondents for the family support variable.

The RR reported in Table 3 was 0.387, with a 95% CI of 0.249–0.603. This value is presented in accordance with the statistical analysis results available in the study data. Further interpretation of this effect measure should be adjusted to the calculation method and reference group used in the statistical analysis.

## DISCUSSION

### *Family Support Among Patients with Pulmonary Tuberculosis*

The results showed that most respondents received high levels of family support, with 31 respondents (96.9%) categorized as having high family support, whereas 1 respondent (3.1%) was categorized as having low family support. This finding indicates that family support was a predominant condition among the patients with pulmonary tuberculosis who participated in the study at Menteng Community Health Center, Palangka Raya City. This finding is consistent with previous studies showing that family support plays an important role in supporting treatment adherence among patients with tuberculosis (Kusbandia et al., 2025; Lutfian et al., 2025). Social and family support may also help patients cope with various challenges throughout the treatment process (Stanga et al., 2021).

Family support for patients with tuberculosis may be provided in several forms, including emotional, informational, instrumental, and motivational support. Emotional support may help patients cope with psychological distress and stigma during treatment (Rachmawati et al., 2020; Rachmawati et al., 2022). Informational support may improve patients' understanding and confidence in undergoing treatment (Rachmawati et al., 2022; Solikhah et al., 2019). Meanwhile, instrumental support may include assistance with food, accompaniment to healthcare facilities, and supervision of medication intake (Nursasi et al., 2022; Maciel et al., 2008).

The high level of family support observed in this study may be associated with family involvement throughout the patient's care process. Family involvement, collaboration with healthcare professionals, and support from the surrounding environment may contribute to the continuity of tuberculosis treatment (Kusbandia et al., 2025; Stanga et al., 2021). In

addition, the family's social circumstances and knowledge of tuberculosis may influence the forms of support provided to patients (Gurusinga et al., 2024; Munsab et al., 2013).

### ***Medication Adherence Among Patients with Pulmonary Tuberculosis***

The results showed that 19 respondents (59.4%) were categorized as adherent to their medication, whereas 13 respondents (40.6%) were categorized as non-adherent. These findings indicate that although the majority of respondents were adherent, a considerable proportion of patients remained non-adherent to treatment. This condition is consistent with previous studies showing that TB treatment adherence remains a challenge, with several studies reporting adherence rates below 50% (Manurung et al., 2025; Shinde, 2024). Treatment interruption or discontinuation is also an issue that may affect the success of tuberculosis therapy (Kumar et al., 2024).

Medication adherence among patients with tuberculosis is not only associated with family support. Knowledge of tuberculosis and health literacy are associated with patients' ability to follow treatment appropriately (Qomariyah & Piyabanditkul, 2023; Ozaltun & Akin, 2024). Patient motivation has also been reported to be associated with treatment adherence (Zeng et al., 2024; Nindrea et al., 2025). In addition, support from the healthcare system may help patients maintain adherence throughout treatment (Nindrea et al., 2025; Ganesan et al., 2026).

### ***Relationship Between Family Support and Medication Adherence***

The analysis showed a  $p$ -value of 0.406 at a significance level of  $\alpha = 0.05$ . Thus, this study found no statistically significant relationship between family support and medication adherence among patients with pulmonary tuberculosis at Menteng Community Health Center, Palangka Raya City. This result represents an empirical finding of the present study and should be understood in light of the characteristics of the respondent data distribution.

The findings of this study differ from those of several previous studies. A study among patients with tuberculosis in South Korea reported a positive relationship between family support and treatment adherence (Jang & Lee, 2022). A study among patients with drug-resistant tuberculosis in Nigeria also reported a significant association between social support and adherence (Adejumo et al., 2025). A study in Indonesia likewise reported a relationship between family support, motivation, and tuberculosis treatment adherence (Nindrea et al., 2025).

The difference between the findings of this study and those of previous studies does not necessarily indicate that family support has no role in treatment adherence. Several studies have demonstrated an association between family or social support and better adherence (Jang & Lee, 2022; Adejumo et al., 2025). However, other studies have shown that family or social support is not always sufficient to ensure that patients remain adherent throughout the entire treatment period (Khakhong et al., 2023; Nirmal et al., 2022).

### ***Family Support Does Not Always Ensure Adherence***

Family support is an important source of support for patients with tuberculosis, but its presence does not always result in treatment adherence. Family support may be limited in terms of maintaining continuous assistance throughout the treatment period (Khakhong et al.,

2023). In addition, a qualitative study showed that patients may continue to experience adherence barriers despite receiving strong social support (Nirmal et al., 2022).

Several other factors may affect adherence even when patients receive family support. Psychological factors such as anxiety, depression, and low self-efficacy may constitute barriers to adherence (Namsraijav et al., 2026; Mangela et al., 2026). Tuberculosis-related stigma may also hinder patient adherence (Adejumo et al., 2025). In addition, limited knowledge about tuberculosis and its treatment may result in available support being insufficient to produce optimal treatment behavior (Jang & Lee, 2022).

Practical barriers should also be considered when understanding patient adherence. Medication side effects, forgetting to take medication, and difficulties with transportation and access to healthcare facilities may hinder adherence (Gugssa Boru et al., 2017; Ozaltun & Akin, 2024). Thus, family support is one component of the patient's support system and is not the only factor associated with adherence.

### ***Possible Explanations for Differences in Study Findings***

Differences between the findings of this study and previous studies may be related to the characteristics of the samples and study populations. Studies examining the relationship between family support and adherence have used different sample sizes and involved patient groups with different characteristics (Sukartini et al., 2020; Lei et al., 2016). Differences in geographic regions and population characteristics may also result in different social, cultural, and healthcare system conditions (Du et al., 2020; Jang & Lee, 2022).

The study setting may also influence the forms of support received by patients. Studies on tuberculosis adherence have been conducted in various healthcare settings, including hospitals, health centers, and community clinics (Jang & Lee, 2022; Nindrea et al., 2025). Differences in healthcare settings may affect access to resources and family involvement in supporting patients (McInerney et al., 2007).

Differences in measurement instruments may also be one reason why findings regarding family support and adherence are not always consistent. Studies have used various instruments, questionnaires, and scales to measure support and adherence (Du et al., 2020; Jang & Lee, 2022). Differences in the validity and reliability of instruments may affect measurement accuracy and the comparability of findings across studies (Yin et al., 2012).

The operational definition of family support also varies across studies. Support may be measured based on emotional, appraisal, motivational, or family health task dimensions (Nindrea et al., 2025). Differences in how these variables are defined and measured may make findings difficult to compare directly.

### ***Distribution of Family Support and Interpretation of the Statistical Test***

In this study, the distribution of family support was highly imbalanced, with 31 respondents in the high category and only 1 respondent in the low category. This condition should be considered when interpreting the analysis of the relationship using the Chi-square test. Very low expected frequencies in a contingency table may affect the validity of the Chi-square approach (Jo & Kim, 2022; Sawilowsky, 2011).

When expected frequencies are low, Fisher's exact test may be a more appropriate alternative for tables with small sample sizes or imbalanced group distributions (Jo & Kim, 2022; Lin et al., 2024). However, this study cannot conclude that the assumptions of the Chi-square test were violated without examining the expected count in each cell of the contingency table. Therefore, examining the expected counts is necessary as part of the methodological evaluation of the analytical results.

### ***Other Factors That May Affect Adherence***

The results showed that family support was not statistically significantly associated with medication adherence. This finding suggests that other factors may also be related to patients' adherence behavior. Knowledge and health literacy are among the factors associated with tuberculosis treatment adherence (Qomariyah & Piyabanditkul, 2023; Ozaltun & Akin, 2024).

Patient motivation is also a factor associated with treatment adherence. Patients with higher motivation have been reported to tend toward better adherence (Zeng et al., 2024; Nindrea et al., 2025). Conversely, a longer treatment duration may constitute a barrier because patients may experience fatigue or declining motivation during the treatment process (Steulet et al., 2026; Shinde, 2024).

Support from the healthcare system is also a factor associated with treatment continuity. Healthcare professional support, including information, treatment assistance, and healthcare services, may help patients complete treatment (Zeng et al., 2024; Ganesan et al., 2026). Psychosocial factors as well as economic and structural barriers may also affect patient adherence (Shinde, 2024; Namsraijav et al., 2026).

### ***Use of the MMAS-8 for Measuring Adherence***

This study used the MMAS-8 to measure medication adherence. The Mandarin version of the MMAS-8 has been used to detect adherence levels among 358 patients with tuberculosis in rural China (Xu et al., 2017). The study used the instrument to identify patients with low adherence levels, but its abstract did not provide detailed psychometric statistics.

Systematic reviews of the reliability and validity of the MMAS-8 have been conducted across various conditions, but the findings did not specifically provide psychometric evidence for patients with tuberculosis (Moon et al., 2017). On the other hand, a study has developed a tuberculosis-specific adherence scale for patients with tuberculosis (Meng et al., 2026). Although the MMAS-8 has been used among patients with tuberculosis in previous studies, the psychometric evidence specifically reported for TB populations remains an issue that should be considered.

### ***Research Implications***

The results showed that high levels of family support were not statistically associated with medication adherence among the respondents. Therefore, efforts to improve adherence should not focus solely on family support. The approach should also consider knowledge, motivation, treatment duration, and healthcare support (Qomariyah & Piyabanditkul, 2023; Ozaltun & Akin, 2024; Ghazali & Murani, 2023).

Family support remains relevant in the care of patients with tuberculosis because various studies have demonstrated its contribution to adherence and treatment success. However, the findings of this study indicate that the presence of high family support does not automatically result in high adherence among every patient. Healthcare approaches may integrate family support with education, patient motivation, and healthcare professional support (Rachmawati et al., 2020; Rachmawati et al., 2022; Nirmal et al., 2022).

Overall, this study demonstrates a difference between the predominantly high level of family support and the non-significant relationship between family support and medication adherence. This difference should be understood in the context of sample characteristics, variable distribution, measurement instruments, and other factors associated with adherence. The relationship between family support and adherence may vary according to the population, setting, instruments, and study conditions (Sukartini et al., 2020; Lei et al., 2016; Du et al., 2020).

## CONCLUSION

This study showed that most patients with pulmonary tuberculosis at Menteng Community Health Center, Palangka Raya City, received a high level of family support, whereas only a small proportion were categorized as having low family support. In terms of medication adherence, most respondents were categorized as adherent to their medication, although some respondents remained non-adherent during the treatment process. The analysis showed that there was no statistically significant relationship between family support and medication adherence among patients with pulmonary tuberculosis at Menteng Community Health Center, Palangka Raya City. Thus, the high level of family support observed among most respondents did not demonstrate a statistically significant relationship with medication adherence in this study. This finding should be interpreted in consideration of the highly concentrated distribution of family support in the high category, resulting in relatively limited variation among respondents.

For future researchers, studies on tuberculosis treatment adherence should consider a larger sample size and a more balanced distribution of respondents across family support categories to allow for a more robust analysis of the relationship between variables. Future studies may also consider other factors that may be associated with adherence, such as knowledge, motivation, medication side effects, treatment duration, stigma, access to healthcare services, and healthcare professional support. In addition, the use of measurement instruments appropriate to the characteristics of patients with tuberculosis and careful evaluation of statistical analysis methods should be considered to produce stronger findings that can be compared with those of previous studies.

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