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STUDY ANALYSIS OF SELF-CARE PATTERNS IN PATIENTS WITH DRUG-RESISTANT TUBERCULOSIS IN SEMARANG CITY

Studi Analisis Pola Self-Care pada Pasien dengan Tuberkulosis Resisten Obat di Kota Semarang

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ABSTRAK

Meningkatnya kasus tuberkulosis resistan obat (TB-RO) pada populasi menghadirkan tantangan yang signifikan, khususnya di daerah dengan sumber daya terbatas seperti Semarang, Indonesia, dimana praktik perawatan mandiri sangat penting untuk keberhasilan hasil pengobatan. Penelitian ini bertujuan untuk mengidentifikasi dan menganalisis faktor-faktor yang memengaruhi pola perawatan diri pada pasien TB-RO di Semarang. Studi analitik cross-sectional dilakukan pada Bulan Juli-November 2024 yang melibatkan 30 kasus penderita TB-RO dari fasilitas kesehatan terpilih di Semarang. Data dikumpulkan melalui wawancara terstruktur dengan pasien dan keluarga pasien, menilai informasi demografi, status sosial ekonomi, kepatuhan minum obat, sikap, dan dukungan tenaga kesehatan. Perilaku perawatan diri dievaluasi menggunakan kuesioner yang divalidasi. Analisis statistik secara deskriptif dilakukan menjelaskan gambaran self-care pada penderita TB-RO serta keluarganya. Penelitian ini menunjukkan adanya kesenjangan yang signifikan antara tingginya tingkat pengetahuan pasien dan rendahnya kepatuhan mereka terhadap pengobatan TBC. Hal ini menunjukkan bahwa pengetahuan saja tidak cukup untuk memastikan kepatuhan. Selain itu, tingginya prevalensi efek samping pengobatan (83,3%) muncul sebagai hambatan utama terhadap kepatuhan, sehingga menekankan perlunya strategi manajemen yang lebih baik untuk mendukung retensi pasien dalam pengobatan. Penelitian ini menemukan bahwa meningkatkan kepatuhan pengobatan TBC memerlukan pendekatan komprehensif yang mengatasi hambatan medis, psikologis, dan sosial ekonomi melalui perawatan terpadu, peningkatan dukungan pasien, dan intervensi yang disesuaikan.

***Kata kunci**: faktor sosial ekonomi, kepatuhan, self-care, TB-RO, pengetahuan*

ABSTRACT

The increasing number of drug-resistant tuberculosis (DR-TB) cases in the population presents a significant challenge, particularly in resource-limited areas such as Semarang, Indonesia, where self-care practices are critical to successful treatment outcomes. This study aims to identify and analyze factors that influence self-care patterns in DR-TB patients in Semarang. A cross-sectional analytical study was conducted in July-November 2024 involving 30 cases of DR-TB patients from selected health facilities in Semarang. Data were collected through structured interviews with patients and their families, assessing demographic information, socio-economic status, medication adherence, attitudes, and support from health workers. Self-care behavior was evaluated using a validated questionnaire. Descriptive statistical analysis was carried out to illustrate the self-care practices of DR-TB sufferers and their families. This study showed a significant gap between the high level of patient knowledge and their low compliance with TB treatment. This showed that knowledge alone is insufficient to ensure compliance. Additionally, the high prevalence of treatment side effects (83.3%)

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emerged as a major barrier to adherence, highlighting the need for better management strategies to support patient retention in treatment. This study concluded that improving TB treatment adherence requires a comprehensive approach that addresses medical, psychological, and socioeconomic barriers through integrated care, increased patient support, and tailored interventions.

Keywords: adherence, drug-resistant tuberculosis, knowledge, self-care, socio-economic factors

INTRODUCTION

Drug-resistant tuberculosis (DR-TB) is a serious global health problem, contributing significantly to morbidity and mortality worldwide. The disease is caused by the bacterium Mycobacterium tuberculosis, which has developed resistance to one or more first-line anti-TB drugs, making treatment more complex and less effective. According to the latest global estimates, approximately 450,000 new cases of DR-TB are reported annually, with approximately 30,000 of these cases occurring in children. According to the Global TB Report 2023, Indonesia ranks second in the world in terms of estimated new tuberculosis (TB) cases after India, with a total of 1,060,000 cases (385 per 100,000 population) and 134,000 deaths per year. This figure showed an increase compared to previous years. In 2022, there were 724,309 new cases, which then increased to 792,404 cases in 2023. This number is significantly higher than the pre-pandemic period, when the average number of cases was still below 600,000 per year. This surge in cases poses a challenge for Indonesia in its efforts to achieve its target of eliminating TB by 2030[1]. In Semarang City, there were 5,039 TB sufferers (all types) in 2023, while in 2022, there were 2,474 TB sufferers (53.2%)[2]. Among these cases, pediatric cases account for a significant portion, emphasizing the need for targeted interventions, particularly in densely populated urban areas such as Semarang.

Patients with DR-TB face further challenges due to the complexity and length of treatment, which often involves the use of second-line drugs with more severe side effects. Each individual's ability to adhere to this demanding treatment schedule is limited by their developmental stage and dependence on caregivers. This makes self-care a crucial aspect of disease management in nursing, a crucial issue for families of patients with DR-TB. Self-care, in this context, refers to the activities and behaviors individuals engage in to maintain health, manage symptoms, and improve quality of life. Effective self-care practices for patients with DR-TB include strict adherence to medication regimens, monitoring for adverse reactions, maintaining good nutrition, and following good hygiene practices to prevent the spread of disease[3].

Key self-care practices that can help prevent TB transmission include proper sputum disposal, covering the mouth with a tissue or handkerchief when coughing or sneezing, maintaining good ventilation in living spaces, and adopting healthy living habits such as airing the bed, eating nutritious food, avoiding tobacco and alcohol, and ensuring adequate rest[4][5]. For patients with drug-resistant TB, the role of caregivers is crucial in ensuring these practices are consistently implemented. The use of personal protective equipment, such as masks, is also crucial in reducing the risk of TB exposure, especially in high-risk settings. While these measures are important, a lack of awareness and adherence to proper cough etiquette and mask use among the general public often exacerbates the risk of transmission.

Research on self-care patterns among patients with DR-TB in Semarang is highly relevant given the high burden of TB in the city and the socioeconomic challenges that contribute to the spread of the disease. Semarang, as a densely populated urban area, presents a unique environment to examine the various factors influencing self-care behaviors in patients with DR-TB. These factors include not only medical and treatment-related challenges but also social and economic conditions that affect families' ability to

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adhere to established care routines. Understanding these factors is crucial for developing effective interventions to improve treatment outcomes and quality of life for patients with DR-TB.

With the increasing incidence of DR-TB, research focusing on self-care practices in this population is crucial. By exploring the specific needs and barriers faced by tuberculosis patients with DR-TB in Semarang, this study aims to identify and analyze factors influencing self-care patterns in these patients. These findings are crucial for achieving the long-term goal of TB elimination in Indonesia, as mandated by the National TB Control Program, which targets TB elimination by 2035 and a TB-free Indonesia by 2050.

METHODS

This study was a descriptive analytical study with a cross-sectional approach. Participants consisted of drug-resistant tuberculosis (DR-TB) patients recruited from five community health centers (Puskesmas) in Semarang City, Central Java, Indonesia. Data collection was conducted in a follow-up session after a four-week intervention related to self-care management and was carried out from May to October 2024. In this study, a purposive sampling method was used to select participants. Inclusion criteria included drug-resistant tuberculosis (DR-TB) patients who had been clinically diagnosed by medical personnel at the community health center. Patients who met the inclusion criteria and expressed their willingness to participate after being given an explanation of the study were included as respondents. Exclusion criteria included patients with inadequate data at the pulmonary health facility. Based on these criteria, 30 individuals were eligible to participate in this study. All patients were informed of the purpose, procedures, benefits, and risks of the study, and signed an informed consent form after the explanation (informed consent). This research has also gone through ethical approval from the Health Research Ethics Committee of the Semarang Ministry of Health Polytechnic through ethical clearance certificate number 959/EA/KEPK/2024.

Research Instruments and Data Collection

Data collection began immediately after participants provided informed consent. Participants provided consent after receiving a thorough explanation of the study's purpose, benefits, and the steps taken to maintain the confidentiality of their data. Data were collected using a self-administered questionnaire. Sociodemographic information was also collected from participating individuals. To assess self-care adherence, a self-care adherence questionnaire adapted from previous research and guidelines from the Institute for Functional Medicine was used. This questionnaire assessed various dimensions of self-care, including diet, regular physical activity, emotional regulation, and medication adherence.

This instrument uses a Likert scale with five answer options, ranging from "never" to "often." The questionnaire consists of 30 items, each focusing on aspects of TB patient self-care, such as adherence to treatment, duration of medication use, attitudes toward treatment, and support from healthcare professionals. Validity tests indicate that each item in the questionnaire has an adequate level of validity. Furthermore, reliability tests showed a Cronbach's alpha value of 0.905, indicating high internal consistency.

Data analysis was performed using SPSS version 16 (Statistical Package for the Social Sciences) software. Demographic data, self-care levels measured through compliance indicators, attitudes, knowledge, and support from health workers, and family well-being were analyzed using categories (percentages) and numerical measurements (mean ± standard deviation). In addition to descriptive analysis, correlation analysis between variables was also performed using the Spearman correlation test to assess the relationship between knowledge, attitudes, support from health workers, and self-

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care compliance. The results of the analysis are presented in the form of a correlation coefficient (r) along with its significance value (p).

RESULT

Respondent Demographic Characteristics

A total of 30 respondents participated in this study, consisting of 17 men (56.7%) and 13 women (43.3%). This proportion indicates that cases of DR-TB are not only experienced by men, but also quite a lot in women, so adherence interventions need to consider gender aspects. In terms of education, the majority of respondents completed high school (56.7%), while a small number only completed elementary or junior high school. This condition indicates variations in health literacy capacity that can affect the ability to understand treatment instructions.

Economically, the majority of respondents were in the sufficient income category (73.3%), although there were still low-income groups (20%) who potentially face barriers to access and continuity of therapy. In terms of treatment duration, most respondents were still in the early stages (less than 1 year; 70%), while the remainder had been undergoing therapy for more than a year. This finding is important because the initial phase of therapy is often a critical period in determining consistent adherence.

Comorbidities were also quite high, with diabetes mellitus and other illnesses each affecting 43.3% of respondents, and HIV in 13.3%. The presence of these comorbidities adds complexity to the management of DR-TB, both clinically and in patient self-care. Further details regarding the demographic characteristics of the respondents can be seen in Table 1.

Table 1. Respondent Demographics

Demographic Characteristics	n (%)
Gender	
Man	17 (56.7)
Woman	13 (43.3)
Education	
Graduated from elementary school	3 (10)
Junior High School	2 (6.7)
High School	17 (56.7)
PT	8 (26.7)
Income	
More (≥ Rp. 5,000,000,-)	2 (6.7)
Enough (Rp3,500,000-Rp5,000,000)	22 (73.3)
Less (≤ Rp. 3,500,000,-)	6 (20)
Treatment Time	
< 1 year	21 (70)
> 1 year	9 (30)
Treatment Period	
Short Term (4-9 months)	14 (46.7)
Long Term (≥ 9 months)	16 (53.3)
Other diseases	
DM	13 (43.3)
HIV	4 (13.3)
Other	13 (43.3)

Overall, this demographic distribution showed that education, economic status, and the presence of comorbidities can interact with knowledge, attitudes, and support from healthcare professionals, which have been shown to be significantly associated with self-care adherence. This confirms that adherence-enhancing interventions need to be designed taking into account the socioeconomic background and clinical condition of DR-TB patients.

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Factors Influencing Treatment Compliance

TB-RO patient compliance is influenced by a combination of internal (knowledge, attitudes) and external (drug side effects, healthcare provider support) factors. Descriptive analysis in Table 2 showed that the majority of respondents (73.3%) had low compliance, with a mean score of 1.73 (SD 1.76; 95% CI 1.07–2.39). On the other hand, the majority of patients had good knowledge (73.3%; mean 19.9; SD 2.59), a positive attitude (80%; mean 20.26; SD 2.77), and rated healthcare provider support as good (63.3%; mean 52.23; SD 6.75). However, 83.3% of patients reported experiencing medication side effects, which is potentially the biggest barrier to maintaining compliance.

Spearman correlation analysis supported these findings by demonstrating significant relationships between several key variables. Knowledge level was positively correlated with adherence (r=0.542; p=0.003), indicating that the higher a patient's understanding, the greater their likelihood of adherence. Attitude was also positively correlated with adherence (r=0.476; p=0.009), indicating that patients' positive perceptions and commitment to treatment can increase the likelihood of successful therapy. The factor with the strongest correlation was healthcare professional support (r=0.613; p=0.001), confirming that consistent interaction, motivation, and support from healthcare professionals are key to maintaining patient adherence.

Nevertheless, variations in self-care behavior were still evident. Some patients with good knowledge still showed low adherence, particularly those experiencing severe side effects. Conversely, patients with moderate knowledge who received intensive healthcare support maintained better adherence. This suggests that managing side effects and strengthening healthcare support play a more crucial role than simply improving patient knowledge. Overall, the correlation results indicate that knowledge, attitudes, and healthcare support contribute significantly to self-care adherence. This underscores the need for interventions that not only target patients but also strengthen support systems through education and the active role of healthcare professionals. Details of the correlation test results are presented in Table 2.

Table 2. Categories of Compliance, Knowledge, Drug Effects, Support, and Role of Health Workers

Variables	n (%)	Mean (SD)
Compliance		
Good (score ≥ 5)	3 (10)	1.73 (1.76)
Enough (score 3-4)	5 (16.7)	Lower 1.07
Less (score ≤ 2)	22 (73.3)	Upper 2.39
Knowledge		
Good (score 18-24)	22 (73.3)	19.9 (2.59)
Enough (score 14-17)	8 (26.7)	Lower 18.93
Less (score 0-13)	0 (0.00)	Upper 20.86
Drug side effects		
No adverse effects	5 (16.7)	1.83 (0.37)
Adverse effects present	25 (83.3)	Lower 1.69 Upper 1.97
Attitude		
Good (score 18-24)	24 (80)	20.26 (2.77)
Enough (score 14-17)	6 (20)	Lower 19.22
Less (score 0-13)	0 (0.00)	Upper 21.30
Support & Role of Health Workers		
Good (score 48-64)	19 (63.3)	52.23 (6.75)
Enough (score 36-47)	11 (36.7)	Lower 49.71
Less (score 0-35)	0 (0.0)	Upper 54.75

The results in Table 2 indicate that patient adherence to treatment remains relatively low. Most respondents (73.3%) were in the low adherence category, with a mean score

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of 1.73 ± 1.76 and an estimated interval of 1.07–2.39. This finding confirms that adherence remains a major challenge to the long-term effectiveness of treatment. Conversely, patient knowledge about their health condition and treatment was relatively good. The majority of respondents (73.3%) had adequate knowledge, with a mean score of 19.9 ± 2.59 and an estimated interval of 18.93–20.86. This indicates that although patient understanding is quite good, the translation of knowledge into adherence in practice is still suboptimal.

Table 3. Results of Spearman Correlation Analysis between Main Variables and Self-Care Compliance of TB-RO Patients (n = 30)

Variables	r (Spearman)	p-value
Knowledge	0.542	0.003
Attitude	0.476	0.009
Support for Health Workers	0.613	0.001
Drug Side Effects	-0.421	0.018

The results of the Spearman correlation analysis in Table 3 show that knowledge (r = 0.542; p = 0.003), attitude (r = 0.476; p = 0.009), and support from healthcare professionals (r = 0.613; p = 0.001) have a significant positive relationship with self-care adherence in TB-RO patients. Conversely, drug side effects showed a significant negative correlation with adherence (r = –0.421; p = 0.018). These findings confirm that support from healthcare professionals is the strongest external factor in maintaining adherence, while drug side effects are the main obstacle that needs to be managed more effectively.

Drug Side Effects and Patient Attitude

The majority of respondents (83.3%) reported experiencing side effects during treatment, with a mean score of 1.83 ± 0.37 and an estimated interval of 1.69–1.97. This indicates that side effects are a significant factor potentially reducing patient adherence to therapy. In terms of attitude, the majority of respondents (80%) demonstrated a positive attitude toward treatment. A mean score of 20.26 ± 2.77 with an estimated interval of 19.22–21.3 confirmed that patient attitudes were in the good category. This positive perception plays a supporting factor for successful therapy, despite still facing challenges from drug side effects.

Healthcare Support and Correlation Analysis

Most respondents (63.3%) rated healthcare professional support as good, with a mean score of 52.23 ± 6.75 and an estimated interval of 49.71–54.75. This support was perceived as an important factor in maintaining patient motivation to undergo long-term therapy. Spearman's correlation test showed a positive relationship between knowledge and adherence (r = 0.542; p = 0.003), as did attitudes toward treatment (r = 0.476; p = 0.009). Healthcare professional support showed the strongest correlation with adherence (r = 0.613; p = 0.001). Conversely, drug side effects showed a negative correlation with adherence (r = –0.421; p = 0.018), indicating that the more severe the side effects experienced by patients, the lower their level of adherence. Overall, the study results confirmed a gap between high levels of knowledge and positive attitudes among patients and low levels of adherence. Drug side effects and the quality of healthcare support are key determinants, requiring ongoing interventions, both in the form of education and strategies for managing side effects, to improve adherence in TB-RO patients.

To more clearly see the relationships between variables, the results of the correlation test are visualized in the form of a scatterplot. This image helps show the direction and strength of the relationship, while also providing a clear picture of how the distribution of respondent data forms a specific pattern.

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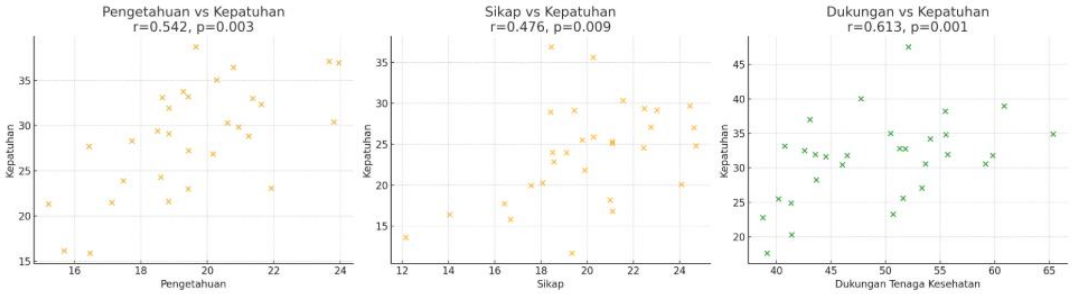

Figure 1. Scatter Plot of Correlation Analysis of Knowledge, Attitude, and Support Variables of Health Workers

Figure 1 showed a consistent pattern: the higher the patient's level of knowledge, the greater their tendency to adhere to treatment (r= 0.542; p = 0.003). A similar pattern is seen in the attitude variable, where patients with a positive attitude toward therapy showed a higher level of adherence (r= 0.476; p = 0.009). Meanwhile, support from healthcare professionals showed the strongest relationship with adherence (r= 0.613; p= 0.001), emphasizing the role of healthcare professionals as a key factor in maintaining patient consistency in treatment. These findings confirm that adherence-enhancing interventions are not sufficient simply by increasing knowledge, but also require strengthening attitudes and ongoing support from healthcare professionals.

DISCUSSION

This study has several limitations. It was conducted in only one city (Semarang), so the results may not be generalizable to populations with different socio-economic characteristics. The data collected relied on subjective reports from respondents, potentially introducing bias, particularly regarding medication adherence and perceived social support. This study also failed to analyze external factors such as health policies and access to healthcare facilities, which may influence self-care patterns in tuberculosis (TB) patients. Furthermore, the short duration of the study prevented the long-term dynamics of changes in self-care behavior from being observed. Therefore, further studies with longitudinal designs are needed to understand these changes more comprehensively.

This limitation is important to understand because drug-resistant TB (DR-TB) remains a serious global problem. An estimated 25,000–32,000 cases of drug-resistant TB (DR-TB) exist worldwide, with approximately 21% of these cases occurring in children, who are at high risk of death from the disease [5]. Previous research has shown advances in diagnosis, shorter treatment durations, and more appropriate therapy formulations for patients with drug-resistant TB. The government, through its national tuberculosis (TB) program, has also made various efforts to improve services, including for multi-drug-resistant TB (MDR-TB), pre-extensively drug-resistant TB (pre-XDR-TB), and extensively drug-resistant TB (XDR-TB). However, optimal care for patients in these categories still requires special attention. Furthermore, adolescents face different challenges than adults, particularly as their needs change with age. This emphasizes the importance of developing care packages and policy recommendations tailored to the age characteristics of patients with drug-resistant TB.

This study emphasizes the importance of addressing both short- and long-term challenges in tuberculosis (TB) treatment, including improving patient adherence, managing side effects, and providing comprehensive care for patients with comorbidities. Correlation analysis in this study demonstrated a significant association between socioeconomic factors, comorbidities, and patient adherence to treatment. These findings underscore the need for continued research and innovation in TB treatment strategies to overcome drug resistance and improve treatment outcomes globally, while

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also providing new insights into the complex interplay between medical and non-medical determinants that influence therapy success.

The high prevalence of comorbidities, particularly diabetes mellitus (43.3%), demonstrates the significant impact these conditions have on treatment outcomes, adherence, and potential complications. Furthermore, the inclusion of income and education variables in the analysis broadens the understanding of socioeconomic determinants that influence adherence, particularly in low- and middle-income countries with a high TB burden. One significant finding in this study is the gap between relatively high levels of patient knowledge and low adherence. The common assumption that knowledge is directly proportional to adherence is challenged by the results of this study. A similar phenomenon has also been reported in previous studies showing that knowledge does not always guarantee behavioral change, as psychological, social, and economic barriers can hinder patients from adhering even if they understand the disease and its treatment [6],[7]. This study also benefited from heterogeneity in treatment duration, where the nearly equal distribution of participants between short-term (46.7%) and long-term (53.3%) therapy allowed for a comparative analysis of treatment effectiveness across different patient subgroups. In addition, the gender distribution (56.7% male and 43.3% female) opens up the opportunity to explore differences in response to treatment based on gender, an aspect that has been rarely studied in TB studies.

The high prevalence of side effects, reported by 83.3% of participants, further complicates adherence to treatment. These side effects can significantly impact patients' willingness or ability to continue therapy, highlighting the need for improved side effect management strategies. Patient education about coping mechanisms, the provision of better symptom relief options, and the development of more tolerable treatment regimens are crucial steps in promoting long-term adherence. Although most patients expressed positive attitudes toward treatment and perceived positive support from healthcare providers, these factors alone were insufficient to improve adherence. This suggests that positive attitudes and external support play a role in the treatment process, but they must be complemented by strategies that address both medical and behavioral adherence challenges.

These findings also highlight the potential of behavior-based interventions to bridge the gap between knowledge, attitudes, and adherence. Strategies such as motivational interviewing, counseling, and peer support programs can play a key role in strengthening adherence by addressing the psychological and social aspects faced by patients.[6]Integrating this intervention into existing healthcare support systems can contribute to improved treatment outcomes. From a policy and practice perspective, this study provides actionable recommendations for healthcare providers and policymakers, including the need for improved protocols for managing adverse drug reactions, the development of integrated care models that consider comorbidities and psychosocial factors, and training for healthcare workers to enhance patient engagement and support[7],[8],[9].

Furthermore, the diverse profile of TB patients in Semarang City in this study provides a strong foundation for longitudinal research to assess long-term treatment outcomes, relapse rates, and the broader impact of comorbidities on TB recovery. By contextualizing barriers to adherence within a specific population, this study offers a deeper understanding of the interrelationships between knowledge, side effects, attitudes, and healthcare provider support. These findings contribute to government and healthcare facility efforts in general to improve TB treatment outcomes, reinforce the need for more targeted interventions aligned with the needs of diverse patient groups, and support evidence-based public health policies.

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Short- to medium-term treatment for tuberculosis (TB) has a major impact on patient health, particularly by alleviating clinical symptoms and minimizing the risk of transmission[10]. Standard treatment, involving a combination of anti-tuberculosis drugs (OTAs) given for at least six months, has been shown to be effective in eliminating Mycobacterium tuberculosis, thereby reducing the overall burden of infection and speeding recovery[11]. Although effective, this treatment is not without challenges. Common side effects, including nausea, hepatotoxicity, and peripheral neuropathy, are common and can significantly hinder patient adherence to prescribed therapy [12] [13]. In addition, TB patients with comorbidities such as diabetes mellitus or HIV/AIDS have a higher risk of experiencing complications during treatment and therefore require closer monitoring and tailored treatment[14] [15].

In the long term, the success of TB treatment is reflected in reduced morbidity and mortality. However, the risk of relapse and the emergence of drug-resistant strains remains a significant concern. Non-adherence to treatment protocols can lead to the development of drug-resistant TB, a more severe form of the disease that requires longer and more expensive treatment and has more side effects.[16]. In addition, even after successful treatment, patients may suffer from chronic lung disorders due to permanent tissue damage caused by the infection, requiring long-term follow-up care[17],[18]. From a public health perspective, successful long-term TB treatment is crucial for global disease control. This not only reduces the incidence of new cases but also helps curb the spread of drug-resistant TB strains, thus contributing to the broader goal of TB eradication[19].

Self-Care Patterns in Drug-Resistant Tuberculosis Patients

Self-care in patients with drug-resistant tuberculosis (TB), self-care is an important aspect of disease management and improving therapy outcomes. As explained in this article, self-care can improve the quality of life of TB patients while reducing the risk of transmission, especially within the family environment. However, encouraging TB patients to adopt self-care is not a simple matter, as it is influenced by various factors such as knowledge level, self-efficacy, communication, and support from health workers and family [21]. The combination of these factors plays a role in shaping effective behaviors in managing drug-resistant TB.

An individual's ability to manage their own health is closely linked to improved therapy outcomes. Research showed that when individuals are actively involved in their own care, they are better able to make informed decisions and take the necessary actions to manage their condition. According to Syahrul et al. (2022), self-care capacity depends not only on knowledge but also on the ability to make decisions and apply them in daily life. For drug-resistant TB patients, this includes adherence to treatment, managing side effects, and implementing preventive measures to reduce the risk of transmission [22]. In this study, patient adherence was still hampered by the high rate of side effects (83.3%), even though the majority of patients expressed a positive attitude toward treatment (80%) and received adequate support from healthcare professionals (63.3%). Efforts to manage side effects were not optimal, thus affecting patient consistency in therapy. Meanwhile, aspects of infection prevention had not been fully integrated into daily practice, despite relatively good patient knowledge. This confirms that the self-care patterns of TB-RO patients in Semarang still need to be strengthened, especially through better management of side effects, continuous family support, and more applicable prevention education.

In addition, self-care is greatly influenced by the patient's support system. Family plays a crucial role in encouraging adherence to treatment and supporting lifestyle changes.[20]Meanwhile, healthcare workers, such as nurses and doctors, play a role in providing education and guidance so that patients have the understanding and skills necessary to manage their health independently. As found in research by Lismayanti et

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al. (2024), self-care for TB patients is a nursing intervention that not only increases patient independence but also empowers patients and their families to play an active role in the care process[21].

Furthermore, research showed that self-care is closely related to patients' knowledge and attitudes toward their disease. For example, a study by Dewi et al. (2020) found that although patients' knowledge about self-care was positively associated with risk-reducing behaviors, their attitudes toward the risk of transmission were still less supportive, resulting in suboptimal actions. This suggests that efforts to improve the effectiveness of self-care in preventing TB transmission must include improvements in both knowledge and changes in patient attitudes[22].

In addition to helping manage physical conditions, improving self-care also plays a role in reducing the psychological burden on patients, especially in cases of drug-resistant TB, which has longer treatment durations and more severe side effects. By equipping patients with adequate knowledge and appropriate support, they are more likely to adopt behaviors that can reduce the risk of disease worsening and prevent transmission to others.

CONCLUSION

This study showed that self-care practices among TB-RO patients in Semarang are not fully effective. Treatment adherence remains low, primarily due to side effects, despite patients' knowledge and attitudes being quite good, and healthcare provider support being deemed adequate. Family support is not yet strong, resulting in an imbalance between internal and external factors in encouraging consistent self-care behavior.

Self-care patterns that need to be strengthened include managing medication side effects, improving medication adherence, and implementing more disciplined transmission prevention measures. Therefore, family and community support must be optimized, along with ongoing education from healthcare professionals. Further research is recommended, using longitudinal designs and community-based interventions to more effectively support the success of therapy in TB-RO patients.

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