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Original Article

Risk Factors for Treatment Drop Out Among Pulmonary Tuberculosis Patients at the UPT Public Health Center in Medan Sunggal

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Abstract

Objective: To determine the factors contributing to treatment dropout in tuberculosis (TB) patients.

Methods: This study utilized a case-control design with a sample size of 81 participants. Univariate, bivariate, and multivariate analyses were conducted, and an accidental sampling technique was employed. The study was conducted at the Public Health Center/*Puskesmas* Medan Sunggal, in the Medan Sunggal District, City of Medan, and North Sumatra Province. The research took place from February to April 2023.

Results: The research analysis revealed a significant relationship between knowledge and family support ($p<0.05$). However, there was no significant relationship found between drug side effects and treatment dropout ($p>0.05$). This lack of significance may be attributed to the consistent occurrence of side effects throughout the different stages of treatment.

Conclusion: In conclusion, this research demonstrates a significant correlation between patients' knowledge, family support, and treatment dropout ($p<0.05$). Conversely, no significant correlation was found between drug side effects and treatment dropout ($p>0.05$).

Keywords: Drug side effect**,** pulmonary TB, TB treatment drop out

Introduction

Tuberculosis is a disease that has spread widely in various countries. The TB bacteria commonly affect the lungs but can also occur outside the lungs. Nearly a quarter of the world's population is infected with Mycobacterium tuberculosis, with about 89% of TB cases occurring in adults and 11% in children. Until this moment (during the COVID-19 pandemic), TB remains the leading cause of death after HIV/AIDS and is one of the top 20 causes of death worldwide. Indonesia ranks third in the world with the highest number of TB cases, following India and China. Globally, it is estimated that 9.9 million people had TB in the year 2020.[1]

Drug-resistant tuberculosis (DR-TB) remains a threat to TB control and is one of the major public health problems in many countries around the world. Globally, in 2019, an estimated 3.3% of new TB cases and 17.7% of previously treated TB cases were classified as drug-resistant TB patients. In the same year, it was estimated that there were 9.96 million incidents of TB worldwide, with 465,000 of them being TB cases with either multidrug-resistant TB (MDR-TB) or rifampicin-resistant TB (RR-TB). Out of the estimated 465,000 DR-TB patients, only 206,030 were successfully detected and 177,099 (86%) were treated, with a global treatment success rate of 57%. In Indonesia, DR-TB accounted for about 2.4% of all new TB cases and 13% of previously treated TB cases, with an estimated total of 24,000 incidents or 8.8 per 100,000 population. In 2019, approximately 11,500 RR-TB patients were detected and reported, with nearly 48% of patients starting second-line TB treatment, and the treatment success rate being 45%.[2]

Based on data from the Health Department of Medan City, it was found that there are still many TB patients who drop out of treatment. In the year 2022, there were a total of 377 TB patients who decided to discontinue their treatment. This can undoubtedly lead to higher levels of drug resistance and increase the risk of transmission to other individuals. According to data at the Public Health Center/*Puskesmas* level, *Puskesmas* Medan Sunggal has the second-highest dropout rate, accounting for 13.6% of the 25 Puskesmas located in Medan City.

Based on the researchers' observations, in Medan Sunggal, there are still many TB patients who stop their treatment, while some continue with the treatment. The researchers aim to investigate the factors that trigger patients to discontinue their treatment. In accordance with the views from the research study conducted by Nugroho,[3] it is stated that the factors leading to treatment dropout are lack of knowledge, lack of family support, and distance to healthcare services, with a significance value of $p<0.05$. This is consistent with the research by Sholihah[4] and Kurnia,[5] which state that the factors contributing to dropout include individuals' lack of knowledge about the treatment duration, absence of a treatment supervisor, and drug side effects leading someone to decide to discontinue treatment, with a significance value of $p<0.05$.

Methods

This research employs quantitative research methods with a descriptive analysis approach in a case-control study. The study was conducted at the *Puskesmas* Medan Sunggal, in the Medan Sunggal District, City of Medan, and North Sumatra Province. The research took place from February to April 2023.

The total population of TB patients between 2021 and 2022 was 183. The research sample consisted of 27 cases and 54 controls, following a 1:2 ratio for comparison. Data were collected using a Likert scale questionnaire. The questionnaire presented statements in negative form with four response options: a score of 4 for "never," a score of 3 for "sometimes," a score of 2 for "often," and a score of 1 for "very often."

The validity of the questionnaire was tested using the Product Moment Correlation, and reliability was assessed using the Cronbach's Alpha coefficient. Initially, the questionnaire consisted of 32 items, and after the validity test, all questions were found to be valid. The reliability test was conducted on the same 32 items, and all statements were considered reliable based on the results, with the calculated r value greater than the tabled r value, ranging around 0.668. Ethical clearance Number: 01.25/37/KEPK/POLTEKKES KEMENKES MEDAN 2023. The grouping was done by calculating the total scores for each assessment component based on predetermined categories. Subsequently, the data were analyzed using frequency distribution, Chi-Square, and Logistic Regression with the step-wise method.

Results

Based on Table 1 above, it is known that more than 50% of respondents who are TB sufferers stated that they lacked knowledge about the impact of dropping out of treatment, the impact of taking OAT, the causes of TB, and the nature of TB disease.

Based on the information provided in Table 2, it is evident that TB sufferers are given 10 questions to assess the severity of drug side effects. On average, more than 50% of respondents experience mild symptoms, including reddish urine, nausea, and loss of appetite. Additionally, the most severe symptoms reported by TB sufferers are itchy skin redness, which affects 60.5% (39) of respondents.

Based on Table 3 above, it is evident that the respondents' most common responses regarding family support are as follows: family consistently reminds TB patients to take their medication, family frequently provides support for TB patients' recovery, and family occasionally demonstrates a positive attitude towards the disease experienced by TB patients.

Based on the information provided in Table 4, it is evident that both dropouts and non-dropouts among TB patients have a limited understanding of TB disease. The chi-square analysis resulted in a p-value of 0.017, indicating a significant relationship between treatment dropouts and knowledge (p-value<0.05). Further analysis revealed odds ratios (OR) of 2.08 and 1.875. These values indicate that TB patients with poor knowledge are 2.081 times more likely to discontinue treatment compared to patients with good knowledge, while those with reasonably good knowledge are 1.875 times more likely to become treatment dropouts.

Based on the data presented in Table 5, it can be concluded that both individuals who

Table 1 Frequency Distribution Based on Knowledge

Questions	Category				Total	
	Don't Know		Know			
	n	%	n	%	n	%
What is TB disease?	42	51.9	39	48.1	81	100
What causes TB?	49	60.5	32	39.5	81	100
Do you know the symptoms of TB?	30	37	51	63	81	100
Do you know how long TB treatment lasts?	10	12.3	71	87.7	81	100
Do you understand the instructions for taking anti -TB drugs?	5	6.2	76	93.8	81	100
Do you know the consequences of interrupting treatment?	63	77.8	18	22.2	81	100
Do you know the effect of taking TB drugs?	50	61.7	31	38.3	81	100

dropped out of TB treatment and those who completed it experienced severe drug side effects. The chi-square analysis resulted in a p-value of 0.453, indicating that the observed p-value is greater than 0.05. Therefore, there is no significant relationship between treatment dropouts and drug side effects. Additionally, the odds ratio (OR) value is 1.862, signifying

Table 2 Frequency Distribution Based on Drug Side Effects

Questions	Category				Total	
	No		Yes			
	n	%	n	%	n	%
Do you feel nauseous after taking the drug?	27	33,3	54	66,7	81	100
Do you experience a loss of appetite after taking the drug?	28	34.6	53	65.4	81	100
Do you feel stomach pain after taking the drug?	45	55.6	36	44.4	81	100
Do you feel feverish after taking the medicine?	57	70.4	24	29.6	81	100
Does your urine turn reddish after taking the medicine?	2	2.5	79	97.5	81	100
Do you feel a burning sensation in your legs after taking the medicine?	56	69.1	25	30.9	81	100
Do you experience skin itchy redness on your skin after taking the drug?	32	39.5	39	60.5	81	100
Do you experience hearing loss after taking the drug?	47	58	34	42	81	100
Do you experience balance disorders after taking medication?	58	71.6	23	28.4	81	100
Visual impairment	62	76.5	19	23.5	81	100

Table 3 Frequency Distribution Based on Family Support

Questions	Category								Total	
	Never		Sometimes		Often		Always			
	n	%	n	%	n	%	n	%	n	%
Does your family remind you to take your medication?	8	9.8	19	23.5	20	24.7	34	42	81	100
Does your family consistently provide support for your recovery?	7	8.6	19	23.5	32	39.5	23	28.4	81	100
Does your family exhibit attitude that make you feel happy and peaceful?	2	2.5	22	27.2	29	35.8	24	29.6	81	100
Do you feel cared for by your family?	6	7.4	22	27.2	29	35.8	24	29.6	81	100
Do you feel valued within your family?	3	3.7	21	25.9	29	35.8	28	34.6	81	100
Is your family positive about the disease you are suffering from?	6	7.4	23	28.4	31	38.3	21	25.9	81	100
Does your family play a role in helping you cope with anxiety?	9	11.1	19	23.5	28	34.6	25	30.9	81	100
Does your family instill confidence in you that you can manage this illness well?	10	12.3	14	17.3	30	37	27	33.3	81	100

that patients who encounter severe drug side effects are 1.862 times more likely to discontinue treatment compared to patients experiencing mild drug side effects.

Based on the information presented in Table 6, it is evident that TB patients receive considerable support from their families throughout the lengthy treatment process, which can span across several months. The chi-square analysis reveals a p-value of 0.003, indicating a statistically significant relationship between treatment dropouts and the level of family support as p-value <0.05. Furthermore, the OR value of 4.643

Table 4 Relationship between Knowledge and the Incidence of Pulmonary TB Treatment Dropouts

Knowledge	Drop Out				Total		p-value	OR (95% CI)
	DO		Not DO					
	n	%	n	%	n	%		
Not good	21	88	24	60	45	70	0.017	2.081 (1.046–4.138)
Good	3	12	16	40	19	30		
Total	24	100	40	100	64	100		
Quite good	3	50	14	47	17	47	0.017	1.875 (0.151–5.054
Good	3	50	16	53	19	53		
Total	6	100	30	100	36	100		

p-value 0.710>0.05, there have significant between drug side effect and incidence of pulmonary TB treatment

Table 5 Relationship between Drug Side Effects and Incidence of Pulmonary TB Treatment Dropouts

Drug Side Effects	Drop Out (DO)				Total		p-value	OR (95%CI)
	DO		Not DO					
	n	%	n	%	n	%		
Severe	25	93	47	87	72	89		
Mild	2	7	7	13	9	11	0.710	1.862 (0.35–9.642)
Total	27	100	54	100	81	100		

p-value 0.710>0.05, there have significant between drug side effect and incidence of pulmonary TB treatment

Table 6 Relationship between Family Support and Incidence of Pulmonary TB Treatment Dropouts

Family Support	Drop Out (DO)				Total		p-value	OR (95%CI)
	DO		Not DO					
	n	%	n	%	n	%		
Not Good	13	48	9	17	22	27		
Good	14	52	45	83	59	73	0,010	4.643 (1.641–13.139)
Total	27	100	54	100	81	100		

p-value 0.010<0.05, there have significant between family support and incidence of pulmonary TB treatment

suggests that individuals with insufficient family support are 4.643 times more likely to discontinue treatment compared to patients who have strong family support.

Discussion

In this study, a statistically significant relationship was found between treatment dropouts and knowledge, with a p-value of <0.05. It was observed that TB patients have insufficient knowledge about TB disease. This finding is consistent with the research conducted by Rumoalat,[6] which also highlighted a significant relationship between TB treatment dropouts and knowledge. Similar results were obtained by Sulistyoningtyas and Khusnul[7], who reported a significant relationship between treatment dropouts and knowledge.

The researcher's investigation revealed that the services provided by the Puskesmas (Community Health Centre) are generally satisfactory, as healthcare personnel always educate TB patients when they are initially diagnosed with the disease, explaining its impact on them. However, the education provided by the healthcare personnel is often not retained by the patients after the initial diagnosis.

According to Nugroho's research, newly diagnosed TB patients often experience shock as they never expected to have TB. With healthcare personnel providing education only at the time of diagnosis, it is recommended that alternative methods of conveying education and information to TB patients be used to improve their understanding.

Furthermore, Marselia's research indicates that successful treatment outcomes can be achieved by providing patients with good knowledge about TB.[8] Patients with limited knowledge have a 1.3 times higher risk of not undergoing treatment compared to those who are well-informed about TB. These findings can serve as a reference for medical professionals to enhance education for TB patients, with the aim of achieving optimal and complete treatment. The study did not find a significant relationship between treatment dropouts and drug side effects, which aligns with the research by Tika and Cahyati[9] and Fitriani[10]. However, their studies stated that severe drug side effects can contribute to treatment discontinuation. On the other hand, Merzistya[11] indicated a relationship between

treatment dropouts and drug side effects. Their study revealed that drug side effects are more common in the early weeks of treatment (the first and second week), leading patients to lose hope as the symptoms worsen instead of improving. To alleviate drug side effects, measures such as administering pain relievers (ibuprofen) and vitamin B6 can be taken, particularly to prevent peripheral neuropathy caused by isoniazid, an anti-TB medication. Flu-like symptoms caused by anti-TB drugs, such as weakness, fever, and headaches, can be managed by providing paracetamol to alleviate the experienced side effects. Effective communication, information, and education to healthcare professionals and the public are necessary to minimize the risks associated with drug side effects. However, the observations made by the researcher indicate that healthcare professionals have not provided comprehensive information about the impact of TB drug side effects. They only inform TB patients of common side effects, such as reddish urine, loss of appetite, and itching. It is crucial for healthcare professionals to provide a brochure detailing the potential side effects that patients may experience and inform them about solutions to manage these side effects, so that patients do not discontinue treatment.

In this study, a significant relationship was found between treatment dropouts and family support. TB patients generally receive good family support. This is consistent with the research conducted by Merzistya[12] and Nugiawati[13], which also highlighted a significant relationship between treatment dropouts and family support. Family support is a crucial factor in ensuring an individual's adherence to TB treatment until completion. Syafruddin[14] found that a balanced combination of family support and the patient's desire to recover can have a positive impact and increase treatment completion rates.

Through direct observations made by the researcher, it was revealed that family support in Puskesmas Sunggal is generally good, as families consistently support patients in completing their treatment. However, there are still some families who neglect their sick relatives, resulting in TB patients being cared for by their cousins or grandchildren. Despite these challenges, some TB patients show considerable strength and determination to recover.

In conclusion, this research emphasizes the importance of addressing knowledge gaps, providing comprehensive patient education, effectively managing drug side effects, and fostering strong family support systems to enhance TB treatment adherence and completion rates. These insights can inform healthcare strategies aimed at optimizing TB patient care and improving treatment outcomes.

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