



Factors Affecting Self Efficacy to Medication Adherence Among Pulmonary Tuberculosis Patients in Padang Lawas Regency

Halimatun Syakdiyah Harahap¹, Lita Sri Andayani², R Kintoko Rochadi³

¹Master Student of Health Education and Behavioral Sciences Department, Faculty of Public Health, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia

^{2,3} Health Education and Behavioral Sciences Department, Faculty of Public Health, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia

Email: halimatunsyakdiyah1999@gmail.com

Article details:

Published: 29th March 2025



Abstract

Tuberculosis (TB) remains a major global health challenge, particularly in developing countries like Indonesia. Medication adherence is crucial for successful TB treatment, yet many patients struggle to follow their prescribed regimens. Understanding factors influencing adherence, such as self-efficacy, is essential to improving treatment outcomes.

This study aimed to analyze the influence of self-efficacy on medication adherence among pulmonary tuberculosis patients in Padang Lawas Regency. A cluster sampling technique was used, involving a total of 102 respondents. Data analysis included univariate analysis to present the frequency distribution of each variable and bivariate analysis using the chi-square test. The results showed a significant relationship between self-efficacy and medication adherence (p -value= 0.000). However, other variables such as drug side effects (p -value= 0.223) and the role of treatment supervisors (p -value= 0.114) were not significantly associated with medication adherence. Healthcare providers should focus on enhancing patients' self-efficacy through targeted counseling and education programs to improve medication adherence among pulmonary tuberculosis patients.

Keywords: Adherence, Medication, Tuberculosis, Self-efficacy

To cite this article :

Novitasari Wijayanti Silalahi, R. Kintoko Rochadi, L. S. A. (2025). The Relationship Between Self Efficacy And Sedentary Behavior Among Early Adult (Aged 20-24 Years) In Medan City. *International Journal of Health, Education and Social (IJHES)*, 8(3), 12–24.



Introduction

Tuberculosis (TB) is an infectious disease caused by the bacteria *Mycobacterium tuberculosis* which is one of the top 10 causes of death worldwide. The World Health Organization (WHO) estimates that 10 million people have suffered from tuberculosis and 1.4 million people died from tuberculosis in 2019 (WHO, 2020). The Ministry of Health (2023) detected 717,941 cases, in 2024 there were 1,060,000 cases with 134,000 deaths and the success rate of tuberculosis treatment in Indonesia was 86 percent. This number increase 61,98% compared to the previous year which was 443,235 cases. North Sumatra Province is ranked third in Indonesia for the highest burden of tuberculosis after West Java and East Java Provinces (North Sumatra Provincial Health Office, 2023). In 2024, in the period January-July, there were 2,300 cases of tuberculosis in Padang Lawas Regency (Padang Lawas Regency Health Office, 2024).

Patient compliance in complying with treatment can be influenced by several factors. A study conducted by Xu et al. (2021) stated that female gender, older age, and low education have a high percentage of low TB treatment compliance. The success of tuberculosis treatment itself cannot be separated from patient compliance in taking medication, because according to the Indonesian Ministry of Health (2019), the level of treatment success is influenced by patient factors (compliance in taking medication), self-efficacy factors and drug or drug supply factors. Anti-tuberculosis drugs (OAT) are currently guaranteed by the government and have been provided free of charge at health facilities, however, the level of drug compliance as seen from the treatment success rate is still below standard.

This study was conducted in Padang Lawas Regency, where there are 15 Health Centers with a total of 2,300 tuberculosis cases in 2024 (Data from Padang Lawas Health Office). The success rate of tuberculosis treatment in this area in 2023 only reached 83 percent, still below the global target of 90 percent. One of the main causes of treatment failure is patient non-compliance in taking medication according to the recommended dose. This study aims to analyze the influence of self-efficacy on medication adherence behavior among pulmonary tuberculosis in Padang Lawas Regency.



Methods

This study is a quantitative research using descriptive analysis with a cross-sectional design. Collecting data includes acquiring original data. The population in this study were patients with Pulmonary TB within a maximum of 6 months after diagnosis in 17 Health Centers in Padang Lawas Regency totaling 2300 cases (Padang Lawas Regency Health Office, 2024). The sampling technique in this study used Cluster sampling. Because the population coverage is very large, the researcher took 30 percent (Creswell, 2022) from 17 Health Centers so that 5 Health Centers were obtained. The total number of respondents was 102 respondents. Data analysis was conducted using univariate analysis to produce a frequency distribution of each variable and bivariate analysis using the chi-square test. The data collection method in this study used primary data, namely questionnaires and secondary data obtained from official websites namely WHO, TOSS TB and the Ministry of Health.

Results

Univariate Analysis

Table 1. Frequency Distribution of Respondents Based on Respondent Characteristics

Respondent characteristics	n	%
Age		
19-44 years	17	16.7
45-59 years	85	83.3
Gender		
Women	31	30.4
Man	71	69.6
Marital status		
Marry	99	97.1
Not married yet	3	2.9
Education		
Tall	74	72.5
Low	28	27.5
Work		
Work	23	22.5
Doesn't work	79	77.5
Total	102	100



According to table 1, From a total of 102 respondents, most respondents were aged 45-59, namely 85 people (83.3%) and those aged 19-44 were 17 people (16.7%). The majority of respondents in this study were male, totaling 71 people (69.6%). The characteristics of respondents based on marital status, it is known that more respondents are married, totaling 99 people (97.1%). The characteristics of respondents based on education, it is known that more respondents have secondary or higher education, totaling 74 people (72.5%) and those with low education, totaling 28 people (27.5%). The characteristics of respondents based on occupation, it is known that more respondents are working, totaling 79 people (77.5%) and those who are not working, totaling 23 people (22.5%).

Table 2. Frequency Distribution of Respondents' Answers Based on Self-Efficacy

Statement Items	Strongly agree	Agree	Doubtful	Don't agree	Strongly disagree
I feel confident in being able to take the TB medication that was given.	52 (51.0%)	22 (21.6%)	18 (17.6%)	7 (6.9%)	3 (2.9%)
I feel confident in being able to undergo treatment with a daily routine.	59 (57.8%)	23 (22.5%)	15 (14.7%)	2 (2.0%)	3 (2.9%)
I feel confident that I will be able to take my medication as prescribed even when traveling for several days.	55 (53.9%)	20 (19.6%)	17 (16.7%)	7 (6.9%)	3 (2.9%)
I feel confident in being able to talk to a health care professional if I experience side effects.	58 (56.9%)	18 (17.6%)	16 (15.7%)	7 (6.9%)	3 (2.9%)
I feel certain that I need to buy medicine if the doctor does not provide free treatment.	57 (55.9%)	18 (17.6%)	17 (16.7%)	7 (6.9%)	3 (2.9%)
I feel confident to continue the treatment even though I experience side effects from the medication.	55 (53.9%)	21 (20.6%)	16 (15.7%)	7 (6.9%)	3 (2.9%)
I felt confident wearing a mask around others during the early stages of treatment.	57 (55.9%)	20 (19.6%)	15 (14.7%)	7 (6.9%)	3 (2.9%)
I feel confident in limiting contact with others during the initial stages of treatment.	58 (56.9%)	20 (19.6%)	15 (14.7%)	6 (5.9%)	3 (2.9%)



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I feel confident that I can afford additional medical tests during the course of treatment.	57 (55.9%)	19 (18.6%)	16 (15.7%)	7 (6.9%)	3 (2.9%)
I feel confident not to stop going to the health facility to get my next TB medication.	56 (54.9%)	20 (19.6%)	15 (14.7%)	8 (7.8%)	3 (2.9%)
I feel confident that I can take TB medication in any situation and condition.	57 (55.9%)	18 (17.6%)	16 (15.7%)	8 (7.8%)	3 (2.9%)
Total	567	219	176	73	33

Based on the frequency distribution of respondents' answers on self-efficacy, the most were strongly agreeing with a total of 567 respondents, and the least were strongly disagreeing with a total of 33 respondents.

Table 3. Distribution of Respondent Categories Based on Self-Efficacy

Self Efficacy	n	%
Tall	92	90.2
Low	10	9.8
Total	102	100

The respondents with the most high self-efficacy were 92 people (90.2%), and the respondents with low self-efficacy were 10 people (9.8%).

Table 4. Distribution of Respondent Categories Based on Drug Side Effects

Drug Side Effects	n	%
Experiencing side effects	96	94.2
No side effects	6	5.9
Total	102	100



Based on the table above, the respondents who experienced the most drug side effects were 96 people (94.1%) and those who did not experience drug side effects were 6 people (5.9%).

Table 5. Frequency Distribution of Respondents' Answers Based on the Role of Medication Supervisors

Statement Items	Yes	No
The role of the family/medication supervisor is to always remind people to take their medication on time.	89 (87.3%)	13 (12.7%)
Family/supervisor taking medication is important to you	88 (86.3%)	14 (13.7%)
Family/supervisor of medication taking ensures that medication is always taken	91 (89.2%)	11 (10.8%)
Your family/medication supervisor invites you to have a tuberculosis examination	92 (90.2%)	10 (9.8%)
PMO ensures that you have had a sputum re-examination after you are ready for treatment.	92 (90.2%)	10 (9.8%)
Total	452	58

Based on the frequency distribution of respondents' answers based on the role of drug supervisors, the most frequent answer was "yes" with a total of 452 and the least frequent answer was "no" with a total of 58.

Table 6. Distribution of Respondent Categories Based on the Role of Medication Supervisors

The Role of Medication Supervisors	n	%
Good	87	85.3
Not enough	15	14.7
Total	102	100

Based on the table above, 87 respondents (85.3%) played a good role in supervising medication intake and 15 respondents (14.7%) played a poor role in supervising medication intake.



Table 7. Frequency Distribution of Respondents' Answers Based on Medication Compliance

Statement Items	Yes	No
I once forgot to take my TB medication	87 (84.5%)	16 (15.5%)
I once took TB medication without following the instructions given by the health worker.	85 (82.5%)	18 (17.5%)
If I feel better, I sometimes stop taking my TB medication.	87 (84.5%)	15 (14.6%)
After taking TB medication and experiencing side effects, I stopped taking the medication.	85 (82.5%)	17 (16.5%)
When I was traveling, I once forgot to bring my medicine.	85 (82.5%)	17 (16.5%)
I am looking for information if I experience side effects from medication.	84 (81.6%)	18 (17.5%)
I take the medicine as instructed by the health worker.	85 (82.5%)	17 (16.5%)
Total	598	118

Based on the frequency distribution of respondents' answers based on medication compliance, the most frequent answer was "yes" with a total of 598 and the least frequent answer was "no" with a total of 118.

Table 8. Distribution of Respondent Categories Based on Medication Compliance

Medication Compliance	n	%
Good	80	78.4
Not enough	22	21.6
Total	102	100

Based on the table above, the respondents who were most compliant in taking medication were 80 people (78.4%) and those who were not compliant in taking medication were 22 people (21.6%).



Bivariate Analysis

Table 9. Relationship between Respondent Characteristics and Compliance in Taking Tuberculosis Medication

Respondent characteristics	Medication Compliance				Total		p
	Good		Not enough		n	%	
	n	%	n	%			
Age							
19-44 years	17	100	0	0	17	100	0.323
45-59 years	63	74.1	22	25.9	85	100	
Gender							
Woman	29	93.5	2	6.5	31	100	0.226
Man	51	71.8	20	28	71	100	
Marital status							
Marry	77	77.7	22	22.3	99	100	0.479
Not married yet	3	100	0	0	3	100	
Education							
Tall	23	82.1	5	17.9	28	100	0.394
Low	57	78	17	22	73	100	
Work							
Work	73	92.4	6	69.6	79	100	0.345
Doesn't work	3	30.4	16	7.6	23	100	

Based on the table above, the results of the cross-tabulation between the characteristics of respondents and compliance with taking medication show that the age category of 45-59 years is good, as many as 63 people (74.1%) with the chi-square test results obtained a p-value of 0.323 ($p > 0.05$); it means there is no relationship between age and medication adherence. The good gender category is male, totaling 51 people (71.8%) with the chi-square test results obtained a p-value of 0.226 ($p > 0.05$); it means there is no relationship between gender and medication adherence.

The best marital status category is married, totaling 77 people (77.7%) with the chi-square test results obtained a p-value of 0.479 ($p > 0.05$); it means there is no relationship between marital status and medication adherence. The best education category is low, totaling 57 people (78.8%) with the chi-square test results obtained a p-value of 0.394 ($p > 0.05$); it means there is no



relationship between education and medication adherence. The best job category is 73 people (92.4%) with the chi-square test results obtained a p-value of 0.345 ($p > 0.05$); it means there is no relationship between work and medication adherence.

Table 10. Factors related to Compliance in Taking Tuberculosis Medication

Variables	Medication Compliance				Total		p
	Good		Not enough		n	%	
	n	%	n	%			
Self Efficacy							
Tall	80	86.9	12	13.1	92	100	0,000
Low	0	0	10	0	10	100	
Drug Side Effects							
Has side effects	74	77	22	23.3	96	100	0.223
No side effects	6	100	0	0	6	100	
The Role of Medication Supervisors							
Good	66	75.8	21	24.2	87	100	0.114
Not enough	14	93.3	1	6.7	15	100	

Based on table 10. In the efficacy variable, it can be seen that of the 10 respondents who fall into the low self-efficacy category, the most are less with a total of 10 people (100%), and of the 92 people who fall into the high self-efficacy category, the most are good with a total of 80 people (86.9%) with chi-square test results obtained a p-value of 0.001 ($p < 0.05$); it means there is a relationship between self-efficacy and medication adherence. Furthermore, the variable of drug side effects with tuberculosis medication adherence showed that of the 6 respondents who were categorized as not experiencing the most drug side effects, namely good with a total of 6 people (100%), and of the 96 people who were categorized as experiencing the most drug side effects, namely good with a total of 74 people (77.0%) with the chi-square test results obtained a p-value of 0.223 ($p > 0.05$); it means there is no relationship between drug side effects and medication adherence.

From table 10. between the variables of the role of drug supervisors and compliance with taking tuberculosis medication, it can be seen that of the 87 respondents who were in the category



of the role of drug supervisors, the most were good, with a total of 66 people (75.8%), and of the 15 people who were in the category of the role of drug supervisors with the less than adequate category, 14 people (93.3%) with the results of the chi-square test obtained a p-value of 0.114 ($p > 0.05$); it means there is no relationship between the role of medication supervisors and medication adherence.

Discussion

Relationship between Respondent Characteristics and Medication Compliance

Based on the results of the chi-square test between the age variable and medication adherence, a p-value of 0.323 was obtained ($p > 0.05$); meaning there is no relationship between age and medication adherence. The results of this study are in line with research conducted by Anaam et al. (2023) which stated that there is no relationship between age and medication adherence. In general, the risk of disease will increase with age. Along with the increasing risk of disease, decreased memory in elderly TB patients so that they become forgetful can also be a factor that can affect adherence in treatment (Arinda, 2021). Therefore, supervision in the treatment of elderly TB patients needs to be increased. To improve medication adherence in tuberculosis patients in health promotion is to provide health education and counseling about the disease and medication adherence. The problem of non-compliance mentioned above can be reduced by good communication between patients and health workers and by counseling. (WHO, 2019).

The good gender category is male, which is 51 people (71.8%) with the chi-square test results obtained a p-value of 0.226 ($p > 0.05$); meaning there is no relationship between gender and medication adherence. Based on gender, the level of compliance of male respondents is greater than the level of compliance of female respondents. Based on gender, it is inversely proportional to the results of Hayati (2020) which stated that the level of compliance of female respondents was greater than that of male respondents. The results of the study by Asriwati et al. (2021) also showed that TB sufferers were more dominated by men (55.9%) than women (44.1%). The bivariate analysis did not show any relationship between gender and medication adherence ($p \text{ value} > 0.05$).



However, the results of studies by Adisa, Ayandokun and Ige (2021) and Dogah et al. (2021) showed a significant relationship between gender and medication adherence ($p\text{-value} < 0.05$), where men tended to be more compliant with treatment than women.

According to Zanani (2021), men and women have the same opportunity to get positive and negative motivation and information, so the opportunity to comply with treatment in men and women will be the same. There are several reasons why cases of Pulmonary Tuberculosis are more common in men. Specific factors related to gender have often been associated with a number of non-communicable or infectious diseases such as Pulmonary Tuberculosis. Differences in hormones and gene structure can be the cause of why a disease attacks one sex more than the other (Neyrolles & Quintana-Murci, 2019).

Based on the results of this study, the best marital status category, married, amounted to 77 people (77.7%) with the results of the chi-square test obtained a $p\text{-value}$ of 0.479 ($p > 0.05$); meaning there is no relationship between marital status and medication adherence. This study is in line with (Shania, 2023) which shows no relationship between marital status and medication adherence ($p\text{-value} > 0.05$). The results of this study are in line with the results of a study conducted by Woimo (2017) which stated that there was no relationship between marital status and medication adherence. However, the results of Fang et al.'s study (2019) showed a significant relationship between marital status and medication adherence ($p\text{-value} < 0.05$). Marital status for sufferers is a family support consisting of a wife or children, but also a supporter in medication adherence to achieve success in treatment. Research related to family support with medication adherence in TB sufferers conducted by Sutini (2018) obtained significant results related to this.

Based on the results of the study, the best education category, namely low, amounted to 57 people (78.8%) with the results of the chi-square test obtained a $p\text{-value}$ of 0.394 ($p > 0.05$); meaning there is no relationship between education and medication adherence. This study is also in line with the results of research conducted by Marahatta et al. (2021) which showed that there was no relationship between education level and medication adherence. However, the results of research from Arinda (2021) showed a significant relationship. This is in line with the results of



research (Irvan, 2017) that the level of compliance of respondents with high education is more compliant than those with low education, in accordance with the statement of Erni, Purwanta, and Subekti (2019) that the higher the level of education of respondents, the higher the level of non-compliance. This can be caused because the higher a person's level of education, the better their level of knowledge and ability to receive information, both positive and negative information. People with high education will be able to make the best decisions regarding their recovery, so that their motivation to recover will be higher.

Based on the results of the study related to the relationship between work and medication adherence, the best job category is working with a total of 73 people (92.4%) with the results of the chi-square test obtained a p-value of 0.345 ($p > 0.05$); meaning there is no relationship between work and medication adherence. This is in contrast to the study conducted by Ruditya (2018) that respondents who work have a higher level of compliance than those who do not work because the motivation of workers to recover is higher because there are demands to meet the needs of their lives and their families.

Work carried out to earn a living to support the lives of people with pulmonary tuberculosis. People who work tend to have less time to visit health facilities (Notoatmodjo, 2007). This is the same as research by Fitri, (2018) and Pulungan et al., (2021), which found that work has a significant relationship with patient compliance in undergoing treatment, where patients who work tend to be less compliant in undergoing treatment compared to those who do not work and patients who do not work have more free time so they are more regular in taking medication.

Self-Efficacy

Based on 102 respondents, 90 people were in the high self-efficacy category, the most of which was good, with a total of 80 people (86.9%) with the chi-square test results obtained a p-value of 0.001 ($p < 0.05$); meaning that there is a relationship between self-efficacy and medication adherence. This result is in line with research conducted by Enggar, showing a positive pattern with a moderate degree of relationship strength ($r = 0.470$). This means that the better the self-



efficacy, the more compliant they will be in undergoing tuberculosis treatment until complete according to the prescribed dose (Enggar, 2017). This is in line with the results of research (Nur akbar, 2018) from 61 adult TB clients who had low self-efficacy, 44.3% showed non-compliance with treatment. Among adult TB clients who had high self-efficacy, 10.4% showed non-compliance with treatment. There is a relationship between self-efficacy and medication adherence with a $p\text{-value} < 0.05$. Adult TB clients who have low self-efficacy are at 6 times greater risk of non-compliance with treatment than adult TB clients who have high self-efficacy.

Murdaugh and Parsons (2020) stated that the greater the perception of self-efficacy, the fewer the perception of barriers to specific behavior and the greater the tendency to persist in commitment to an action. The same results were obtained in a study conducted by Octavia (2017) in Jambi, showing that most respondents had low self-efficacy towards medication adherence behavior. Self-efficacy is expressed as a person's belief in their ability to organize and carry out an action needed to achieve a result. In self-efficacy, a dynamic process occurs which includes cognitive, motivational, affective and selection where individuals evaluate their ability to do something.

Drug Side Effect

Based on 102 respondents, 96 people were categorized as having the most side effects from the drug, namely 74 people (77.0%) with the results of the chi-square test obtained a $p\text{-value}$ of 0.223 ($p > 0.05$); meaning there is no relationship between drug side effects and medication adherence. This result is in line with research that has been conducted (Ananda, 2021) at the South Tangerang City Hospital that the data obtained in this study were carried out with a $p\text{-value}$ of 0.042 so that the $p\text{ value} > 0.05$, based on the results of the test so that there is no significant relationship between the level of medication adherence and drug side effects.

Tuberculosis treatment consisting of at least 5 types of drugs 2 and given for a fairly long time can be at risk of increasing the occurrence of side effects, monitoring at the beginning of treatment is carried out to monitor for side effects (TB Indonesia, 2022). Several studies have



stated that complaints of side effects of tuberculosis treatment such as nausea, vomiting, headaches, vertigo, insomnia and psychiatric conditions such as depression, feelings of confusion and suicidal ideation are the main reasons for not continuing treatment. In addition, the large number of drugs, pain due to daily infection programs and patients feeling bored because of the long treatment time also have an effect.

The Role of Medication Supervisors

Based on 102 respondents, 15 people were included in the category of drug-taking supervisory roles with a category of less than 14 people (93.3%) with The chi-square test results obtained a p-value of 0.114 ($p > 0.05$); meaning there is no relationship between the role of the medication supervisor and medication adherence. The family reminding the patient to take medication when they forget is one form of the family's role as a PMO, where this is a form of real support given by the family to the patient with tuberculosis.

This is not in line with the results of the study (Jufrizal, Hermansyah, and Mulyadi, 2016) the role of the family as a PMO has a significant relationship with the success rate of pulmonary TB treatment. The role of the drug supervisor has the task of supervising and provide encouragement for TB patients to take medication and take medication regularly and remind TB patients to re-examine their sputum at the specified time (Ministry of Health of the Republic of Indonesia, 2021). This study is not in line with the research conducted by Maulidia (2020), Septia, Rahmalia, and Sabrian (2020) and Sutini (2020) which stated that there is a significant relationship between the role of medication supervisors and medication adherence.

The results of a study conducted by Rey (2019) stated that 66% of tuberculosis patients did not carry out the DOTS program on the grounds that there was no PMO. Explaining that there is no relationship between the role of PMO and the success of tuberculosis treatment. In contrast to the study (Yuan Yu, 2019 which stated that direct supervision of treatment through PMO significantly influenced the success of tuberculosis treatment. This domain focuses on TB clients



feeling comfortable when talking openly about their illness to family, friends or other people around them.

Assessing confidence to tell several people at home about TB diagnosis; Assessing confidence to tell everyone at home about TB diagnosis, assessing confidence to tell relatives about TB diagnosis, assessing confidence level to tell friends around about TB diagnosis, assessing confidence level to tell people around if they have TB disease and refusing to care for children because they have TB (Mason et al., 2021).

The role of medication supervisors is very much needed in the compliance of taking medication for tuberculosis patients. According to the facts in the field that occurred in Padang Lawas Regency, the role of medication supervisors consists of the closest family such as wives and children. The role of medication supervisors for tuberculosis patients in Padang Lawas Regency is very good in helping to remind patients to always take their medication routinely, accompany them in re-examinations and pick up medication at health facilities.

Conclusion

The study concluded that among the factors affecting between respondent characteristics, self-efficacy, drug side effects, and the role of treatment supervisors, only self-efficacy was significantly associated with medication adherence in pulmonary tuberculosis patients, with a p-value of 0.000.



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International Journal of Health, Education and Social (IJHES)