IJTID. Volume 13 No 1 January-April 2025
Sinta 2 (Decree No: 105/E/KPT/2022)
e-ISSN: 2356-0991; p-ISSN:2085-1103
Available online at https://e-journal.unair.ac.id/IJTID

Original Article

IJTID
(INDONESIAN JOURNAL OF TROPICAL AND INFECTIOUS DISEASE)
Scientific Journal of Tropical and Infectious Disease

Factors Analysis That Affecting The Treatment Success in Tb Patients in Situbondo Regency

Hasri Yulia Sasmita[1]*, Yuly Peristiowati, Nurwijayanti[1]

[1]Postgraduate School of Public Health, STRADA Indonesia Institute of Health Sciences, Manila st number 37, Tosaren, Pesantren, Kediri, East Java, Indonesia, 64123

OPEN ACCESS

ARTICLE INFO

Received: June 28, 2024
Accepted: March 1, 2025
Published: April 30, 2025
Available online: April 30, 2025

*) Corresponding author:
E-mail: hasrikesmas@gmail.com

Keywords:
Tuberculosis,
Compliance
Successful Treatment
Direct Influence
Indirect Influence

This is an open access article un- der the CC BY-NC-SA license (https://creativecommons.org/li - censes/by-nc-sa/4.0/)

Abstract

Tuberculosis (TB) remains one of the top 10 lethal infectious diseases). In addition, the low case detection rate indicates that the community still has a large number of sources of transmission. Directly Observed Treatment Short-course (DOTS) strategy aims to reduce the new TB cases number by 80% and deaths by up to 90% in 2030. Drug-resistant TB cases especially multidrug resistant TB, exacerbate tuberculosis control because they receive TB treatment irregularly and do not comply to recommended treatment schedules, nonetheless, consistent treatment is critical to successful TB treatment. TB data in Situbondo district show that case detection was 911 out of 1539 cases or 59.14% and treatment success rate was 275 out of 911 cases or 30.2%. This study aims to examine the influence of knowledge, medication supervisors, family support, drug side effects, attitudes, length of treatment, and house physical environment on the treatment success through medication compliance factors. This research is explanatory with 196 respondents while the analysis uses SMART PLS 4.1.0.3. There is a direct influence of medication supervisors, family support, drug side effects, house physical environment and medication compliance and an indirect influence of medication supervisors, family support, drug side effects, and attitudes to TB treatment success. It is hoped that Public Health Centre officers can be more active to educate, detect TB suspect, and also supervise patient so compliance and treatment can be achieved. The patient's family can be more active in providing support during the treatment period for TB sufferers.

Cite this as: Sasmita, H. Y., Peristiowati, Y., and Nurwijayanti. (2025). Factors Analysis That Affecting The Treatment Success In Tb Patients In Situbondo Regency. *Indonesian Journal of Tropical and Infectious Disease*, 13(1) : 60–78. https://doi.org/10.20473/ijtid.v13i1.59100

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

INTRODUCTION

Tuberculosis (TB) is still a problem that is difficult to eliminate. Starting from low case detection, cases that have not been diagnosed and treated with the cure rate during 2020-2022 reaching 18-30%, as well as the complete treatment rate which has decreased.[1,2] Globally, TB cases during 2020-2022 continued to increase, namely 10 million cases to 10.3 million cases and increasing again to 10.6 million cases. Indonesia is in second place after India with a proportion of cases of 10% whose discovery and treatment coverage never reached the target of more than 85% during 2020-2022 with percentages of 41.7%, 47.1% and 74.7%.[2,3]

East Java is one of the provinces that accounts for nearly all tuberculosis cases in Indonesia. Out of 724,309 cases, there were 78,336 cases. Of these, 72.8% were discovered and treated. Furthermore, the treatment success rate fell short of the target of more than 90%, i.e., 88.4% in 2022. The case development rate indicates that, in Situbondo, there were 911 cases (59.14%) out of 1539 cases, of these, 275 cases were found and treated (30.2%).[4,5]

Cases of multidrug resistant (MDR) TB or TB resistant to antituberculosis medications challenge the management of TB. The number of MDR TB cases in Indonesia increased to 24,000, 27,000 and 31,000 in 2020-2022.[3] This was as a result of inconsistent therapy that doesn't occur within the allotted period. The goals of TB treatment are to cure patients, avoid medication resistance and prevent mortality. Thus, the effectiveness of TB treatment is influenced by patient compliance with medication.[6]

Many elements influence compliance, such as the patient's strong motivation, which keeps him from giving up and accepting his circumstances. Another consideration is the amount of time needed; patients may become bored and experience psychological strain when given extended periods of time. However, some patients are reluctant to stick with the treatment, because after one to two months, their symptoms start to get better. Furthermore, patients' non-compliance with therapy can also be contributed to drug side effects such as nausea, joint discomfort, redness and itching because they believe their reaction is growing worse.[6–8]

According to earlier studies, medication compliance and the adverse effects of anti-TB medications were directly correlated. People are less likely to take anti-TB medications when the adverse effects are severe.[9] High compliance with medications is correlated with improved self-efficacy, according to other study.[10] In addition, drug side effects and length of treatment have an impact on medication compliance among Indonesian TB patients.[11,12] Additionally, research indicates that 233 patients (40.04%) reported feeling better or no longer had symptoms, which accounted for the majority of the cause for patient noncompliance.[13] The aim of this study is to examine the variables influencing the success of TB patients' treatments in Situbondo Regency.

MATERIALS AND METHODS

This design of this study is explanatory. Patients with TB who have been declared cured or finished their treatment in 2023 represent the population. The study was carried out in the Situbondo district's health centers in April and May of 2024. Using the Slovin formula, the sample size was calculated, yielding 196 participants.

The study variable assesses the impact of medication compliance elements

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

on treatment outcome, including knowledge, medication supervisors, family support, drug side effects, attitude, length of treatment, and house physical environment. New TB patients with bacteriological confirmation who have been declared cured and finish treatment at the Situbondo health centre in 2023 meet the inclusion criteria. The exclusion criteria include less than six months of therapy, not being bacteriologically confirmed, and having an address registered outside of Situbondo. Questionnaire, hygrometer and/or mini particle counter, lux meter are all part of the apparatus. SmartPLS 4.1.0.3 was used for the test analysis.

RESULTS AND DISCUSSION

Results

Table 1. Distribution of respondent characteristics according to age, gender, last level of education, occupation and length of treatment among TB patients in Situbondo regency

Variable	Frequency (n)	Percentage (%)
Age		
10 – 19 years old	5	2.55
20 – 44 years old	79	40.31
45 – 60 years old	65	33.16
> 60 years old	47	23.98
Sex		
Male	103	52.55
Female	93	47.45
Education		
No school	36	18.37
Elementary school	62	31.63
Junior high school	28	14.29
Senior high school	61	31.12
College	9	4.59
Employment		
Unemployment	78	39.80
Farmer	42	21.43
Trader	19	9.69
Labor	24	12.24
Fisherman	3	1.53
Private employees	17	8.67
Civil servant/army/police	2	1.02
Other	11	5.61

Table 1 shows that out of the 196 respondents, the majority of respondents, 79 people (40.31%) were between 20-44 years old, 103 people (52.55%) were male, 62 people (31.63%) had completed elementary school and 78 people (39.80%) were unemployed.

Table 2. Knowledge level

Variable	Frequency (n)	Percentage (%)
Good	135	68.88
Sufficient	2	1.02
Less	59	30.10
Total	196	100

Table 2 shows that the majority of respondents, 135 people (68.88%) have a good deal of knowledge on TB.

Table 3. Medication supervisor

Variable	Frequency (n)	Percentage (%)
Active	142	72.45
Not Active	54	27.55
Total	196	100

Table 3 shows that the majority of respondents, 142 people (72.45%), have a medication supervisor who plays an active role in TB patients.

Table 4. Family support

Variable	Frequency (n)	Percentage (%)
Good	133	67.86
Moderate	13	6.63
Lack	50	25.51
Total	196	100

Table 4 shows that the majority of respondents, 133 people (67.86%) experienced good family support.

Table 5. Drug side effects

Variable	Frequency (n)	Percentage (%)
No	29	14.80
Yes	167	85.20
Total	196	100

Table 5 shows that the majority of respondents, 167 people (85.20%), experienced drug side effects.

Table 6. Attitudes

Variable	Frequency (n)	Percentage (%)
Good	147	75.00
Bad	49	25.00
Total	196	100

Table 6 shows that the majority of respondents, 147 people (75.00%) had a good attitude.

Table 7. Length of treatment

Variable	Frequency (n)	Percentage (%)
≥ 6 months	190	96.94
< 6 months	6	3.06
Total	196	100

Table 7 shows that majority of respondents, 190 people (96.94%) had undergone treatment for at least six months.

Table 8. House physical environment

Variable	Frequency (n)	Percentage (%)
House Density		
Adequate	142	72.45
Not Adequate	54	27.55
Ventilation Quality		
Adequate	138	70.41
Not Adequate	58	29.59
Living Room Lighting		
Adequate	141	71.94
Not Adequate	55	28.06
Bedroom Lighting		
Adequate	135	68.88
Not Adequate	61	31.12
Living Room Humidity		
Adequate	138	70.41
Not Adequate	58	29.59
Bedroom Humidity		
Adequate	139	70.92
Not Adequate	57	29.08
Living Room Temperature		
Adequate	129	65.82
Not Adequate	67	34.18
Bedroom Temperature		
Adequate	133	67.86
Not Adequate	63	32.14
Floor Condition		
Adequate	126	64.29
Not Adequate	70	35.71
Wall Condition		
Adequate	126	64.29
Not Adequate	70	35.71

Based on Table 8, it can be seen that majority have an adequate house density requirements, namely 142 people (72.45%), have an adequate ventilation quality requirements, namely 138 people (70.41%), have adequate lighting in the living room and bedroom requirements, namely 141 people (71.94%) and 135 (68.88%), have an adequate humidity in the living room and bedroom requirements, namely 138 people (70.41%) and 139 people (70.92%), have an adequate living room and bedroom temperature requirements, 129 (65.82%), and 133 (67.86%), have an adequate floor and wall condition requirements, specifically 126 (64.29%), both in living room and bedroom. Overall, various indices of the house physical environment of TB patients in Situbondo regency show that the majority have adequate needs.

Table 9. Medication compliance

Variable	Frequency (n)	Percentage (%)
Successful	149	76.02
Unsuccessful	47	23.98
Total	196	100

Table 9 shows that the majority of respondents, 149 people (76.02%) classified as successful medication.

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

Table 1. Hypothesis result

Variable	P values
Medication supervisor ≥ TB treatment success	0.001
Family support ≥ TB treatment success	0.007
Drug side effects ≥ TB treatment success	0.013
Length treatment ≥ TB treatment success	0.065
House physical environment ≥ TB treatment success	0.002
Medication compliance ≥ TB treatment success	0.000
Knowledge x medication compliance ≥ TB treatment success	0.469
Medication supervisor x medication compliance ≥ TB treatment success	0.045
Family support x medication compliance ≥ TB treatment success	0.010
Drug side effect x medication compliance ≥ TB treatment success	0.004
Attitude x medication compliance ≥ TB treatment success	0.010
Length treatment x medication compliance ≥ TB treatment success	0.305

According to Table 10, the statistically significant variables that have a direct influence on TB treatment success are medication supervisor, family support, drug side effects, house physical environment, and medication compliance. The variables that have an indirect influence on TB treatment success through medication compliance are medication supervisor, family support, drug side effects and attitude.

Discussion

The Influence of Medication Supervisor on TB Treatment Success

The medication supervisor is the first person who communicates with the patient about their treatment. To ensure recovery and prevent drug resistance, every new pulmonary TB patient receiving treatment must be closely monitored while consuming the medication. Before treatment begins for the first time, pulmonary TB patients and their medication supervisors must receive a brief education about TB including symptoms, drug side effects and treatment as well as the importance of daily medication swallowing monitoring to ensure patient compliance. The medication supervisor will remind of the medication-taking schedule, monitor the patient's swallowing, take the patient for regular check-ups and assist if there are any side effects.[14]

The results of the study showed that there was a statistically significant relationship between medication supervisors and the success of TB treatment (p-value = 0.001). The majority of TB sufferers have a medication supervisor who plays an active role in the treatment of TB sufferers. A total of 142 people or 72.45% of respondents answered that the supervisor's role was to swallow medicine properly. Usually the person supervising the swallowing of medicine is the closest family member or cadre.

The results of the research are in line with research conducted by Maulidya et al., 2017[15] which states that medication supervisor influences TB treatment success (p-value = 0.026). The majority of TB sufferers who have medication supervisor were declared cured, namely 18 people (90%) compared to those who did not have medication supervisor, namely two people (10%). The risk of recovery is 13.5 times higher for medication supervisors than those without it. Another study, similar to Mokambu et al. (2023)[16], found that of the 29 people who were successful in TB treatment, 20 people (68.97%) had a medication supervisor that played a good role, as opposed to a medication supervisor that played a fair and poor role, namely eight people (27.59%) and one person (3.45%), respectively. Of the 21

respondents who had a good medication supervisor, 20 people were successful in treatment, while one was unsuccessful.

The Influence of Family Support on TB Treatment Success

Family support consists of encouraging patients to take their medication, expressing sympathy and care, and not avoiding patients' illnesses. Family support is related to TB patient medication compliance, which should be a family member, such as a child or partner, due to their trustworthiness. They can monitor the patient till they actually swallow the drug every day, regularly and on time according to the dose prescribed by the health worker.[17] Support from the closest family which will boost self-confidence. Someone with high self-efficacy will appear optimistic, confident and have a positive outlook.[18]

The support includes reminding the patient of control schedule, taking medication on time and paying attention to patient complaints so that the patient feels comfortable, cared for and loved by the family, all of which contribute to good physical and mental health. Aside from that, the patient's family can also provide financial support, close supervision, and assistance in getting to the hospital so that the patient feels that there is a family who is always willing to accompany and help them financially. Other support involves providing information about the patient's TB, encouraging them not to give up and recovering fast from their condition and providing basic necessities.[19]

This research shows that there is a statistically significant relationship between family support and the success of TB treatment (p-value = 0.007). This happens because the majority or 67.86% of TB sufferers receive good family support compared to sufficient family support, namely 6.63% and less, namely 25.51%. The support provided can be in the form of searching for information, accompanying during consultations, reminding the control schedule to the Health Centre.

Research conducted by Happi et al. (2021)[20] shows that there is a relationship between family support and TB treatment success (p-value = 0.004). The majority of the help supplied was positive, specifically information (86.7%), emotional support (90%), instrumental (90%), and appreciation (96.7%). Information support on treatment is critical for better understanding patient condition including treatment outcomes and progression of TB patient. Emotional support from loved ones can boost patients' excitement by providing comfort and a sense of belonging. Instrumental support offers practical assistance with money, time, facilities, therapy, food and rest. Appreciation support can be provided by offering assistance, encouragement, praise, and including TB patients in decision-making to increase convenience and passion for TB patients.

The Influence of Drug Side Effects on TB Treatment Success

Side effects are an adverse reaction that plays a role in treatment decisions. The occurrence of adverse drug reactions has the potential to result in patients either failing to adhere to their prescribed medication regimen or even discontinuing their treatment.[21,22] The drugs that are often used in the treatment of TB are Isoniazid, Rifampicin, Pyrazinamide, Streptomycin and Ethambutol which will cause side effects, both mild or severe. The large number of side effects in the first and second weeks is due to the initial stage of the drug reacting with antibodies so that allergic reactions/side effects appear. The use of

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

causes various side effects and the most common ones are redness of the urine due to Rifampicin, delivery pain due to Pyrazinamide, nausea due to most antituberculosis drugs (ATDs) and tingling due to Isoniazid. Drug side effects often occur during the initial treatment period, namely in the first and second months, which is the intensive phase.[23] Drug side effects result in the patient not taking medication regularly or even stopping it.[21]

The research shows the influence of drug side effects on the TB treatment success is statistically significant (p-value = 0.013). In this study, it was found that 167 people (85.20%) feel drug side effects. The majority,157 people (80.10%), experienced mild and severe effects simultaneously. The complaints most frequently felt by respondents were stomach pain (mild side effects) and reddish itching (severe side effects) both at 80.10%. However, it does not cause the patient any distress and only occurs at the beginning of treatment, otherwise the patient feels better and has fewer complaints.

This is consistent with prior studies by Amining et al. (2021) [24] that found drug side effects are statistically significantly related to TB cure rates. The majority, 87 people (89.69%), of TB patients who experienced drug side effects were declared cured, whereas 10 people (10.31%) did not recover. The side effect of stomach ache is produced by pyrazinamide and can be lightened by drinking warm water or ginger; however, if the complaint persists, the patient should visit a doctor or health service provider. Also, Rahajeng et al. (2021) stated that all types of TB drugs can cause itching and redness.[25,26] If a person's itching occurs without a rash and there is no evident cause other than anti-TB drugs, the suggested approach is to try symptomatic treatment with antihistamines and skin moisturizers, with TB medication continuing while observed. If a skin rash appears, all anti-TB drugs must be temporarily stopped, and drug challenge implemented.[27]

The Influence of Length of Treatment on TB Treatment Success

Treatment is the way to control the large number of TB sufferers. To destroy tuberculosis bacteria, the treatment lasts 6 to 8 months. The first two months are spent intensively, followed by four months of continuing. The duration of TB treatment is the period of time that pulmonary TB sufferers undergo treatment aimed at preventing recurrence, resistance to ATDs, breaking the chain of transmission, and death.[14]

Long treatment times will cause boredom, allow for non-compliance and result in people dropping out of treatment during the healing period for various reasons, including feeling healthy, or economic factors. Apart from that, the longer TB treatment takes, the greater the stress level of TB sufferers. Many patients after entering the advanced phase stop treatment because they feel they have recovered. In fact, non-compliance with treatment will cause failure and recurrence, thus, sickness continues to spread and resistance develops. If the combination of drugs used is inadequate (type, dose and duration of treatment), pulmonary TB germs will develop into drug-resistant germs.[14] This can increase the risk of morbidity, mortality and drug resistance both in sufferers and in the wider community.[28,29]

The study found that the length of treatment has no direct effect on the outcome of TB treatment (p-value = 0.065). The majority of respondents, namely 190 people (96.94%), had undergone treatment for ≥ 6 months. They continued to carry out treatment even though it required feeling bored and

takes a long time, because the sufferer wants to recover. The minimum TB treatment period is six months with the aim of preventing resistance and killing inactive germs. Repeated sputum examinations are used to track the progress of TB treatment conducted at the final intensive stage (2nd month), one month before the end of treatment (5th month), and at the end of treatment. If all three findings are negative, it is said to be cured or completely treated.[30]

Another factor is that respondents do not want to repeat therapy; therefore, the time period is extended and the dose of medication increases. This is consistent with study conducted by Nasution et al (2023) [31] showing the sufferer's desire to recover fast, aided by motivation from medication supervisor, does not make sufferers feel frightened even though they experience drug side effects such as nausea and dizziness in the early stages of treatment. Motivation is a driving force in the form of the desire to achieve a goal. Motivation will encourage, stimulate, move, provide the background, carry out and control a person and direct healing actions. Motivation is also influenced by knowledge. The higher the amount of information, the greater the desire to recover. The majority of respondents in this study had strong knowledge, with 68.88%. Counseling, medication supervisor and family support can enhance motivation.

The Influence of House Physical Environment on TB Treatment Success

The house environment can affect the health of its residents. Occupancy is related to the floor area of the house which is adjusted to the number of residents. The denser the number of residents, the faster transmission occurs.[32] Density is said to meet the standards if it exceeds 8 m^2/person. Humidity also contributes to the spread of tuberculosis. TB and other harmful bacteria grow in high-humidity conditions (>70%). This happens because more than 80% of the volume of bacterial cells are formed from water. So they can grow and survive there.[33,34]

Air quality is influenced by indoor temperature and humidity as well as sunlight that can enter the room. Exposure to direct sunlight or hot air temperatures causes droplets of *Mycobacterium tuberculosis* bacteria to evaporate into the air, aided by the movement of wind currents which fly along the air flow. Lack of sunlight entering the house and poor ventilation greatly affects air circulation and creates a damp and dark atmosphere, causing germs to survive for days to months in the house. The spread will also be faster under these conditions.

The results of the research show that there is a relationship between the house physical environment and the TB treatment success with a p-value = 0.002. The quality of the house physical environment shows that all indicators meet health requirements. These results are in line with research by Sahadewa et al (2019) and Mardianti et al. (2020)[31,34] which states that there is a significant relationship between density (p-value = 0.002), ventilation (p-value = 0.006), light (p-value = 0.024), humidity (p-value = 0.034), temperature (p-value = 0.006), and air quality (p-value = 0.015) which were all associated with the incidence of pulmonary tuberculosis. Thus, the quality of the house physical environment, which mainly fits the standards, has a role on the TB treatment success.

The Influence of Medication Compliance on TB Treatment Success

Compliance is key to successful treatment. Medication must be taken regularly according to schedule. Especially in the intensive phase, most smear positive

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

TB sufferers can become negative (conversion) within 1-2 months. TB treatment, which is divided into intensive and advanced stages, aims to prevent resistance and kill dormant germs. The final results of the examination with a negative conversion as well as a statement of recovery and complete treatment stated by the doctor indicate the success of the treatment.[17,35]

Patients in this study said that they took medication regularly to get better quickly. They argue that they do not want to repeat treatment for a longer time (could be eight months). Apart from that, the majority of patients receive good family support, which increases their enthusiasm and motivation to complete their treatment completely. Even though there were side effects from the medication, they do not interfere with the respondent's daily activities. Patients also feel better after taking the medicine and believe that the medicine they are taking has the benefit of curing the patient.

This is in accordance with research by Meyrisca et al. (2022)[36] that there is a relationship between compliance and recovery rate (p value = 0.000). The more obedient a patient is in taking medication, the greater the chance of successful treatment. Other research also finds the same result. Of the 62 people who complied, 100% were successful in treatment.[37] There are numerous factors that contribute to medication compliance, including the presence of information and education from health workers to complete treatment until completion, support from the medication supervisor, which plays a role in providing encouragement and motivation so that sufferers do not give up on treatment, positive attitudes, and good family support and willingness. Patients that are motivated to recover are more likely to complete their treatment.

The Influence of Knowledge on TB Treatment Success through Medication Compliance

Medication compliance is affected by one's knowledge of tuberculous patients. The better a person's knowledge about TB and its treatment, the more aware and obedient they will be to undergo a regular treatment program. Knowledge can influence sufferers' understanding of TB disease, which is a dangerous and contagious disease. In addition, knowledge will shape a person's actions (open behavior). Benjamin Bloom stated that the domain of behavior is knowledge, attitudes and actions. Attitudes and actions without good knowledge will not last long. On the other hand, good knowledge will be meaningless if it is not balanced by attitudes and actions.[38]

The results of this study show that there is no significant influence between knowledge and treatment success through medication compliance with a p-value = 0.469. This happened because the majority of respondents' knowledge level was classified as good, namely 135 people or 68.80%. At the time of the interview, the sufferer was aware that tuberculosis was an infectious disease, yet his views and actions were inversely proportionate. For example, some patients believe that tuberculosis is a curse, a genetic sickness, or a mental illness. So, in addition to TB therapy, people are seeking for other therapeutic options that align with their beliefs.

Moreover, good knowledge is not necessarily followed by good attitudes and actions because the knowledge process consists of (six categories, namely knowledge in remembering the material/ information studied, understanding, applying information to real situations, analyzing, making hypothesis and evaluating its benefits. Knowledge is also

supported by educational background.[39] Further investigation reveals that the bulk of respondents (90 persons, 45.92%) have a low educational background (primary to junior high). The higher the level of education, the easier it is to obtain information. According to Darsini et al. (2019)[40], someone who has obtained formal education is accustomed to thinking logically, detecting problems, analyzing, and attempting to solve them. As a result, if higher education provides someone with useful knowledge, it is believed that their attitudes and actions will be positive as well.

This is in accordance with research by Sari et al. (2016)[41] that there is no significant relationship between knowledge and compliance in pulmonary TB sufferers (p-value = 0.619). Good knowledge does not guarantee that it will be directly proportional to the sufferer's behavior. The patient's knowledge which is not followed up with attitude is the cause of the lack of influence between knowledge on the patient's recovery. Knowledge about TB and confidence in treatment progress influence sufferers to choose to complete treatment. Cultural beliefs also influence healing. This means that whether the patient's knowledge is high or low does not affect their recovery.[15,42]

The Influence of Medication Supervisor on TB Treatment Success through Medication Compliance

A medication supervisor is someone who is trusted to monitor and ensure compliance and recovery for TB sufferers during treatment. Medication supervisors can supervise, provide support so that patients want to seek regular treatment and provide education or accompany TB sufferers in taking anti-TB drugs.[16] In this case, they ensure that the patient swallows all the medication regularly and according to standards. A medication supervisor is expected to be able to understand the procedures for taking medication as well as everything related to pulmonary TB disease.

The results of the study show that medication supervisor has an indirect effect on the TB treatment success through compliance to taking medication (p-value = 0.045). This is in line with research conducted by Aini and Astuti (2020)[31] which states that medication supervisors that play an active role have a greater impact on medication adherence than medication supervisors that play a less active role. Research by Ali et al. (2019)[29] also shows a relationship between medication supervisor and medication compliance (p-value = 0.001). Medication supervisors that play a less active role are 4.995 times more likely to cause TB sufferers to become non-compliant with treatment compared to medication supervisors that play an active role.

Family support and acceptance from family members will give sufferers the energy and confidence to make more effort to learn and accept subjective situations such as anxiety, sadness, guilt, annoyance and boredom.[43] Medication supervisors whose role is to directly see TB sufferers swallowing medication have a 20.25 times greater risk of medication compliance. Therefore, the medication supervisor plays an important role in monitoring patient compliance while taking medication until completion of treatment according to the TB treatment program strategy, namely the Directly Observed Treatment Short Course (DOTS).[44]

The Influence of Family Support on TB Treatment Success through Medication Compliance

Family support is very necessary in determining the continuity of treatment. TB

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

sufferers will feel motivated to take medication according to the instructions given. The support provided can be in the form of emotional support, namely communicating love, care and trust to family members. Other support is instrumental support, namely support in terms of goods or services, for example giving money and helping with housework. Information support is also needed because it can provide advice, suggestions, instructions and provide information, for example about the importance of the treatment being undertaken and the impact of not complying with treatment. Apart from that, the support provided can be provided by guiding and dealing with split problems and can be someone in the same situation or similar experience who makes the sufferer feel supported by various ideas and feelings.[14]

The research results of family support have a direct statistical effect on the success of TB treatment (p-value = 0.010). In this case, it was found that the majority of respondents, namely 133 people (67.86%), had received good family support. This is in line with research by Nasedum et al. (2021)[45] showing that there is a significant relationship between patient attitudes and medication compliance (p-value = 0.000). Furthermore, good family support tends to be more compliant, namely 29 people (64.4%), compared to those who are not compliant, namely eight people (17.8%). Another study by Fitriani et al. (2019)[46] also found that 10 people (32.3%) complied to taking medication because they had high family support. Families who live in the same house always remind the respondent about the schedule for taking medication and encourage the respondent to recover and take the sufferer to be examined. So it is better for the child or partner to become a medication supervisor because they are more trustworthy and provide emotional support.[46]

Family support that can be provided is reminding the patient of the patient's control schedule, taking medication on time and paying attention to the patient's complaints so that the patient feels comfortable, cared for and loved by the family, which can affect the patient's physical and mental health. This can reduce the effects of anxiety by directly improving the mental health of individuals or families because sufferers think their family can help overcome their problems. Family support can help patients feel less pain, recover more quickly from their illness, adjust better, and recover faster.[47]

The Influence of Drug Side Effects on TB Treatment Success through Medication Compliance

Most sufferers feel they cannot tolerate the side effects of anti-tuberculosis drugs (ATDs) experienced during treatment. The severity of the side effects experienced will have an impact on the patient's survival and can even result in discontinuation of treatment (loss to follow up) from treatment.[48] The loss to follow up rate should not be more than 10% because this will result in a high proportion of retreatment cases in the future due to ineffective TB control. Therefore, it is very important to maintain the patient's clinical condition during the treatment period so that serious side effects can be identified immediately and managed appropriately.[9] Patients also need to be informed about the side effects of ATDs so that patients do not misunderstand what they are experiencing which can result in drug withdrawal.

The result of research is TB sufferers said that even though they had side effects while undergoing treatment, they continued to take the medication.

Patients who are aware of the side effects of drugs will respond well to these complaints. Apart from that, sufferers also feel that their complaints do not interfere with their daily activities, some even feel that TB medication has made them better from being unable to move and just lying on the bed to being able to move more actively and increase their appetite.

The results of this study show that the drug side effect through medication compliance does not statistically influence the success of treatment (p-value = 0.004). So it can be said that the majority of respondents, namely 174 people (88.8%), had relatively mild drug side effects. The mild side effects of the drug allow patients to tend to be compliant during the treatment period as in line with the research from Aini and Astuti (2020)[49] that drug side effects and medication compliance in pulmonary TB sufferers are statistically related. Respondents in this study stated that the most frequent complaints were stomach pain, itching and redness, nausea, discoloration of urine and tingling. This means that most respondents tend to experience mild and severe side effects compared to severe side effects.

On the other hand, some drug side effects were serious and 41.7% of patients were compliant during treatment while 58.3% were not. Another reason for patients complying is because there is motivation from to quickly recover from their illness.

The Influence of Attitude on TB Treatment Success through Medication Compliance

Apart from knowledge, attitude is also a factor in patient compliance in taking medication. Attitude plays a role in a person's behavior and decision-making during the healing process. A positive attitude that a person has toward their illness will lead to positive health seeking behavior, thereby further encouraging a person in their efforts to complete treatment.[28]

Based on the research results, the patient's attitude has an indirect influence on treatment success through medication compliance (p-value = 0.010). Most of the respondents, namely 147 people (75%), had a moderate attitude with medication compliance which was also moderate, namely 149 people (76.02%). This is in accordance with the theory that plays a role in attitude change including willingness, identification and internalization, it is possible that the sample is in the willingness or identification stage.

The process of willingness occurs when an individual is willing to accept influence from other people or from other groups in the hopes of receiving a positive reaction or response (such as praise or support) from the other party. The identification process occurs when an individual imitates the behavior or attitude of a person or the attitude of another group because this attitude is in accordance with what he considers to be a pleasant form of relationship with the other party. Meanwhile, internalization occurs when an individual accepts influence and is willing to behave according to that influence because this attitude is in accordance with what he believes and is in accordance with the value system he is in compliance with.[28]

This is in line with research by Maulidya et al. (2017)[15] and Ardat (2020)[50] that there is a relationship between patient attitudes and the success of pulmonary TB treatment (p-value = 0.008). Patients who have a good attitude during treatment have a 4,333 times greater chance of recovery compared to patients with a fairly good attitude. The respondent's attitude of being willing to accept doing something that is

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

considered right will influence his behavior. The more the patient agrees to take medication regularly, the more the patient will increase their regularity in taking medication. On the other hand, a negative attitude or lack of agreement with a treatment encourages sufferers to behave non-compliantly, both in terms of repeat treatment and taking medication.[50]

The Influence of Length of Treatment on TB Treatment Success through Medication Compliance

Duration of treatment is the period of time required to carry out treatment with the aim of preventing recurrence, ATDs resistance, breaking the chain of conversion and death. The results of research by Dwiningrum et al. (2021)[51] show that there is a significant relationship between length of treatment and compliance to taking medication (p-value = 0.001). Respondents who underwent treatment for >2 months had a 2.7 times greater risk of non-compliance in taking medication compared to those who underwent treatment for <2 months. TB sufferers must take medication regularly for six months, which has a big impact on curing the disease. If not, it can result in drug resistance so that treatment costs a lot. Apart from that, it can have worse effects than not being treated at all, for example sufferers can relapse at any time. If treatment is carried out for a longer period of time it will have an impact on stress levels. TB sufferers can feel bored of taking medication for quite a long time and every day, coupled with the side effects of the medication which can interfere with daily activities, which has an impact on stress levels.

This is in line with research conducted by Panggayuh et al. (2019)[52] found that there is no relationship between the type of patient and the success of pulmonary TB treatment. Category 1 (for new cases) is given for six months with two months of intensive phase and four months of advanced phase. Category 2 (for old cases) is given in two stages with three months in the initial stage and five months in the advanced stage. Patients with old and new cases of pulmonary TB have the same chance of success in treatment as long as they take ATDs according to the guidelines and at the specified time. The research results show that the majority of TB sufferers have a medication supervisor that actively supports TB treatment (72.45%) and good family support (67.86%), so that sufferers will not feel bored and will still have the desire to complete treatment until they are declared cured. or have completed treatment by a health professional or doctor.

STRENGTH AND LIMITATION

The study examines respondents of all ages who had been declared cured or completed treatment; it is hoped that by knowing the factors that influence the success of treatment, TB control can be better. The method is explanatory research seeks to identify and ensure cause and effect relationships between variables and to know how phenomenon will change or vary within a relationship with other variables.

The limitation of this study was the institutional-based nature of the study which might not apply for other TB patients who didn't visit the institution. Self-report of compliance to medications could also be affected by recall bias. Thus, we suggest further study to investigate patients in hospital. Other variables that can also be examined are the role of health workers, costs, and nutritional status of patients. Qualitative research methods can also be used in the future.

CONCLUSIONS

The conclusion is that there is a significant direct influence between drug side effects, family support, medication supervisors and house physical environment on the success of treatment for TB sufferers in Situbondo Regency. However, there is no significant effect between the length of treatment on the success of TB treatment in Situbondo Regency.

There is a significant indirect influence between knowledge, attitudes, drug side effects, family support and medication supervisors on the success of treatment for TB sufferers in Situbondo Regency. Also, there is no indirect influence between the length of treatment on the success of treatment for TB sufferers in Situbondo Regency.

ACKNOWLEDGMENT

The authors are grateful to all Community Health Centers in Situbondo Regency which facilitated the researcher with respondents. Also, thanks to the respondents who were willing to participate and the cadre who were willing to assist the interviews.

ETHICAL CLEARANCE

The research protocol has been approved by the health research ethics committee of the Indonesian STRADA Institute of Health Sciences with number: 001206/EC/KEPK/I/03/2024.

FUNDING

The research did not receive any specific grant from funding agencies in the public, commercial or not for profit sectors.

CONFLICT OF INTEREST

The study has no conflicts of interest.

AUTHOR CONTRIBUTION

The author contributed to this work. The author has been involved in drafting and revising the content. The author agrees to be accountable for this work.

REFERENCES

1. Luqman, Sudaryo MK, Suprayogi A. Analisis Situasi Masalah Kesehatan Penyakit Menular di Provinsi Kalimantan Barat. J Epidemiol Kesehat Komunitas [Internet]. 2022;7(1):357–74. Available from: https://ejournal2.undip.ac.id/index.php/jekk/article/view/13269
2. Kementerian Kesehatan Republik Indonesia. Laporan Program Penanggulangan Tuberkulosis Tahun 2022 [Internet]. Jakarta; 2023. Available from: https://tbindonesia.or.id/pustaka_tbc/laporan-program-penanggulangan-tuberkulosis-tahun-2022/
3. World Health Organization. Global Tuberculosis Report 2023 [Internet]. Geneva; 2023. Available from: https://iris.who.int/.
4. Kementerian Kesehatan Republik Indonesia. Profil Kesehatan Indonesia Tahun 2022 [Internet]. Jakarta; 2023. Available from: https://p2p.kemkes.go.id/profil-kesehatan-2022/
5. Dinas Kesehatan Provinsi Jawa Timur. Profil Kesehatan Provinsi Jawa Timur Tahun 2022 [Internet]. Surabaya; 2023 Aug. Available

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

from:https://dinkes.jatimprov.go.id/userfile/dokumen/PROFIL KESEHATAN JATIM 2022.pdf

6. Pameswari P, Halim A, Yustika L. Tingkat Kepatuhan Penggunaan Obat pada Pasien Tuberkulosis di Rumah Sakit Mayjen H. A. Thalib Kabupaten Kerinci. J Sains Farm dan Klin [Internet]. 2016 May;2(2):116–21. Available from: http://jsfk.ffarmasi.unand.ac.id/index.php/jsfk/article/view/60
7. Gunawan ARS, Simbolon RL, Fauzia D. Faktor-Faktor yang Mempengaruhi Tingkat Kepatuhan Pasien Terhadap Pengobatan Tuberkulosis Paru di Lima Puskesmas se-Kota Pekanbaru. J Online Mhs Fak Kedokt Riau [Internet]. 2017;4(2):1–20. Available from: https://jom.unri.ac.id/index.php/JOMFDOK/article/view/15495/0
8. Yadav RK, Kaphle HP, Yadav DK, Marahatta SB, Shah NP, Baral S, et al. Health Related Quality of Life and Associated Factors with Medication Adherence among Tuberculosis Patients in Selected Districts of Gandaki Province of Nepal. J Clin Tuberc Other Mycobact Dis [Internet]. 2021 May 1;23. Available from: https://pubmed.ncbi.nlm.nih.gov/33997309/
9. Seniantara IK, Theresia I, Gabrilinda AY. Pengaruh Efek Samping Obat (Obat Anti Tuberculosis) terhadap Kepatuhan Minum Obat pada Pasien TBC di Puskesmas. J Keperawatan Suaka Insa [Internet]. 2018;3(2):1–12. Available from: https://journal.stikessuakainsan.ac.id/index.php/jksi/article/view/98
10. Sutarto, Fauzi YS, Indriyani R, Sumekar RW DW, Wibowo A. Efikasi Diri pada Kepatuhan Minum Obat Anti Tuberkulosis (OAT). J Kesehat [Internet]. 2019;10(3):405–12. Available from: https://ejurnal.poltekkes-tjk.ac.id/index.php/JK/article/view/1479/1044
11. Pasaribu GF, Handini MC, Manurung J, Manurung K, Sembiring R, Siagian MT. Ketidakpatuhan minum obat pada pasien TB paru: Studi kualitatif. J Prima Med Sains [Internet]. 2023;5(1):48–56. Available from: https://jurnal.unprimdn.ac.id/index.php/JPMS/article/view/3788/2442
12. Islam F, Ahmad H, Nurbaya, Ahmad M, Ansar, Ramadhan K, et al. Factors Affecting Treatment Adherence among Patients with Tuberculosis in Indonesia: Literature Review. J Public Heal Pharm [Internet]. 2024;4(1):28–37. Available from: https://jurnal.unismuhpalu.ac.id/index.php/jphp/article/view/5022/374.
13. Lolong DB, Aryastami NK, Kusrini I, Tobing KL, Tarigan I, Isfandari S, et al. Nonadherence to Anti-Tuberculosis Treatment, Reasons and Associated Factors among Pulmonary Tuberculosis Patients in The Communities in Indonesia. PLoS One [Internet]. 2023;18(8 August):1–12. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10409295/
14. Ulfah M. Hubungan Dukungan Keluarga dengan Kepatuhan Minum Obat pada Pasien Tuberkulosis (TBC) di Wilayah Kerja Puskesmas Pamulang Kota Tangerang Selatan Tahun 2011. Universitas Islam Negeri Syarif Hidayatullah Jakarta; 2013.

15. Maulidya YN, Redjeki ES, Fanani E. Faktor yang Mempengaruhi Keberhasilan Pengobatan Tuberkulosis (TB) Paru pada Pasien Pasca Pengobatan di Puskesmas Dinoyo Kota Malang. Prev Indones J Public Heal [Internet]. 2017;2(1):44–57. Available from: https://journal2.um.ac.id/index.php/preventia/article/view/3191
16. Mokambu ZA, Yunus P, Syamsuddin F. Peran Pengawas Minum Obat (PMO) Terhadap Keberhasilan Pengobatan TB Paru Di Wilayah Kerja Puskesmas Bulango Ulu. J Inov Ris Ilmu Kesehat [Internet]. 2023;1(2):22–8. Available from: https://ejurnal.politeknikpratama.ac.id/index.php/Detector/article/view/1357
17. Siregar I, Siagian P, Effendy E. Dukungan Keluarga meningkatkan Kepatuhan Minum Obat pada Penderita Tuberkulosis Paru di Kabupaten Tapanuli Utara. J Kedokt Brawijaya [Internet]. 2019;30(4):309–12. Available from: http://jkb.ub.ac.id/index.php/jkb/article/view/2496
18. Risdayani, Bahar H, G FN. Analisis Kualitatif Peran Keluarga dalam Merawat Anggota Keluarga yang Menderita Penyakit Tuberkulosis Paru di Wilayah Kerja Puskesmas Poasia Kota Kendari Tahun 2016. J Ilm Mhs Kesehat Masy [Internet]. 2016;1(4):1–15. Available from: https://media.neliti.com/media/publications/185173-ID-analisis-kualitatif-peran-keluarga-dalam.pdf
19. Putri MH. Dukungan Keluarga sebagai Faktor Penting dalam Kepatuhan Minum Obat pada Pasien Tuberkulosis Paru. Wellness Heal Mag [Internet]. 2020;2(1):127–34. Available from: https://wellness.journalpress.id/wellness
20. Happi M, Dwi S, Santoso RP, Wijaya A, Prasetyo J. Hubungan Dukungan Keluarga Dengan Keberhasilan Pengobatan Tb Paru Di Poliklinik Paru Rsud Jombang. J Well Being [Internet]. 2021;6(2):26157519. Available from: http://journal.stikes-bu.ac.id/
21. Kurniawan N, Damanik SRH, Indriati G. Faktor-Faktor yang Mempengaruhi Keberhasilan Pengobatan Tuberkulosis Paru. J Online Mhs Bid Ilmu Keperawatan [Internet]. 2015;2(1):729–41. Available from: https://media.neliti.com/media/publications/188864-ID-faktor-faktor-yang-mempengaruhi-keberhas.pdf
22. Due A. What are Side Effects? Eur J Philos Sci [Internet]. 2023;13(1):1–21. Available from: https://philarchive.org/rec/DUEWAS
23. Ningsih ASW, Ramadhan AM, Rahmawati D. Kajian Literatur Pengobatan Tuberkulosis Paru dan Efek Samping Obat Antituberkulosis di Indonesia. Proceeding Mulawarman Pharm Conf [Internet]. 2022 May 31;15:231–41. Available from:https://prosiding.farmasi.unmul.ac.id/index.php/mpc/article/view/647
24. Amining F, Herawanto, Syahadat DS, Hasanah. Pengaruh Peran Pengawas Menelan Obat dan Efek Samping Obat Anti Tuberkulosis Terhadap Angka Kesembuhan (Cure Rate) Pasien Tuberkulosis. Prev J Kesehat Masy [Internet]. 2021;2(1):386–99. Available from: https://jurnal.fkm.untad.ac.id/index.php/preventif/article/view/451

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

25. Maghfiroh L, Irnawati. An Overview of Side Effects of OAT and Compliance with Taking Drugs in TB Patients. 16th Univ Res Colloqium Univ Muhammadiyah Pekajangan Pekalongan. 2022;47:498–505.
26. Rahajeng B, Shafira N, Utami P. Effects of Anti Tuberculosis Side Effect on the Quality of Life of Tuberculosis Patients in RSKP Respira Yogyakarta at the Period of January-June 2019. Proc 4th Int Conf Sustain Innov 2020–Health Sci Nurs (ICoSIHSN 2020) [Internet]. 2021;33:321–6. Available from: https://www.atlantis-press.com/article/125951249.pdf
27. Kementerian Kesehatan Republik Indonesia. Pedoman Nasional Pelayanan Kedokteran Tata Laksana Tuberkulosis. 2020.
28. Mientarini EI, Sudarmanto Y, Hasan M. Hubungan Pengetahuan dan Sikap terhadap Kepatuhan Minum Obat Pasien Tuberkulosis Paru Fase Lanjutan di Kecamatan Umbulsari Jember. J IKESMA [Internet]. 2018;14(1):11–8. Available from: https://jurnal.unej.ac.id/index.php/IKESMA/article/view/10401
29. Ali SM, Kandou GD, Kaunang WP. Faktor-Faktor yang Berhubungan dengan Kepatuhan Berobat Penderita TB Paru di Wilayah Kerja Puskesmas Siko Kota Ternate. Graha Med Nurs J [Internet]. 2019;2(1):72–81. Available from: https://journal.iktgm.ac.id/index.php/nursing/article/view/69
30. Kementerian Kesehatan Republik Indonesia. Peraturan Menteri Kesehatan Republik Indonesia Nomor 67 Tahun 2016 tentang Penanggulangan Tuberkulosis. Kementerian Kesehatan Republik Indonesia. Jakarta; 2016.
31. Nasution N, Arwina H, Nababan D, Silitonga E. Dorongan Motivasi Kesembuhan Penderita TB Paru di Wilayah Kerja Puskesmas Huristak Kabupaten Padang Lawas. J Ners [Internet]. 2023;7(2):993–1004. Available from: https://journal.universitaspahlawan.ac.id/index.php/ners/article/view/16896
32. Sahadewa S, Eufemia, Edwin, Luh N, Shita. Hubungan Tingkat Pencahayaan, Kelembaban Udara, dan Ventilasi Udara dengan Faktor Risiko Kejadian TB Paru BTA Positif di Desa Jatikalang Kecamatan Krian Kabupaten Sidoarjo. J Ilm Kedokt Wijaya Kusuma [Internet]. 2019;8(2):118–30. Available from: https://journal.uwks.ac.id/index.php/jikw/article/view/617
33. Sidiq N, Wahiduddin, Sidik D. Faktor Risiko Lingkungan Terhadap Kejadian Tuberkulosis Paru di Wilayah Kerja Puskesmas Somba Opu. J MKMI. 2013;29–35.
34. Mardianti R, Muslim C, Setyowati N. Hubungan Faktor Kesehatan Lingkungan Rumah Terhadap Kejadian Tuberkulosis Paru (Studi Kasus di Kecamatan Sukaraja Kabupaten Seluma). Nat J Penelit Pengelolaan Sumber Daya Alam dan Lingkung [Internet]. 2020;9(2):23–31. Available from: https://ejournal.unib.ac.id/index.php/naturalis/article/view/13502/0
35. Rismayanti EP, Romadhon YA, Faradisa N, Dewi LM. Hubungan Dukungan Keluarga dengan Tingkat Keberhasilan Pengobatan Pasien Tuberkulosis Paru. 13th Univ Res Colloqium [Internet].

2021;191–7. Available from: https://repository.urecol.org/index.php/proceeding/article/view/1322

36. Meyrisca M, Susanti R, Nurmainah. Hubungan Kepatuhan Penggunaan Obat Anti Tuberkulosis dengan Keberhasilan Pengobatan Pasien Tuberkulosis di Puskesmas Sungai Betung Bengkayang. Lumbung Farm J Ilmu Kefarmasian [Internet]. 2022;3(2):277–82. Available from: https://journal.ummat.ac.id/index.php/farmasi/article/view/9049
37. Asrifuddin A. Analisis Capaian Keberhasilan Pengobatan TB Paru (Treatment Success Rate) Di Puskesmas Ranotana Weru Kota Manado. J Kesehat Masy [Internet]. 2018;7(1):69–76. Available from: https://ejournal.unsrat.ac.id/index.php/kesmas/article/view/22934
38. Wisesa W, Pebriyani U, Sudiadnyani NP, Lestari SMP. Hubungan Tingkat Pengetahuan tentang Penyakit Tuberkulosis dengan Kesembuhan Penderita Tuberkulosis Paru di Puskesmas Panjang Tahun 2021. Med Prof J Lampung [Internet]. 2021;11(4):383–90. Available from: https://www.journalofmedula.com/index.php/medula/article/download/497/651/4735
39. Fitria CN, Mutia A. Hubungan Tingkat Pengetahuan tentang Tuberkulosis dengan Kepatuhan Minum Obat di Puskesmas. J Ilmu Keperawatan dan Kebidanan [Internet]. 2016;7(1):41–5. Available from: https://ejr.umku.ac.id/index.php/jikk/article/view/125
40. Darsini, Fahrurrozi, Cahyono EA. Pengetahuan Artikel Review. J Keperawatan [Internet]. 2019;12(1):95–107. Available from: https://e-journal.lppmdianhusada.ac.id/index.php/jk/article/view/96
41. Sari ID, Mubasyiroh R, Supardi S. Hubungan Pengetahuan dan Sikap dengan Kepatuhan Berobat pada Pasien TB Paru yang Rawat Jalan di Jakarta Tahun 2014. Media Penelit dan Pengemb Kesehat [Internet]. 2016;26(4):243–8. Available from: https://media.neliti.com/media/publications-test/179255-hubungan-pengetahuan-dan-sikap-dengan-ke-c70b2fba.pdf
42. Rahmi N, Medison I, Suryadi I. Hubungan Tingkat Kepatuhan Penderita Tuberkulosis Paru dengan Perilaku Kesehatan, Efek Samping OAT dan Peran PMO pada Pengobatan Fase Intensif di Puskesmas Seberang Padang September 2012 - Januari 2013. J Kesehat Andalas [Internet]. 2017;6(2):345–50. Available from: https://jurnal.fk.unand.ac.id/index.php/jka/article/view/702/558
43. Asyrofi A, Setianingsih, Khakim M. Perbedaan Kepatuhan Minum Obat Pasien TB Paru dari Berbagai Dukungan Keluarga. Community Publ Nurs [Internet]. 2018;6(3):165–72. Available from: https://ojs.unud.ac.id/index.php/coping/article/download/53581/31754
44. Inayah S, Wahyono B. Penanggulangan Tuberkulosis Paru dengan Strategi DOTS. Higeia J Public Heal Res Dev [Internet]. 2019;3(2):223–33. Available from: https://journal.unnes.ac.id/sju/higeia/article/view/25499/13478
45. Nasedum IR, Simon M, Fitriani. Hubungan Dukungan Keluarga terhadap Kepatuhan Pengobatan Pasien Tuberkulosis Paru. Wind

Copyright ©2025 Indonesian Journal of Tropical and Infectious Disease

Heal J Kesehat [Internet]. 2021;4(4):358–63. Available from: http://jurnal.fkmumi.ac.id/index.php/woh/article/view/woh4408

46. Fitriani NE, Sinaga T, Syahran A. Hubungan antara Pengetahuan, Motivasi Pasien dan Dukungan Keluarga terhadap Kepatuhan Minum Obat Anti Tuberkulosis (OAT) pada Penderita Penyakit TB Paru BTA (+) di Puskesmas Pasundan Kota Samarinda. Kesmas Uwigama J Kesehat Masy [Internet]. 2019;5(2):124–34. Available from: http://dx.doi.org/10.24903/kujkm.v5i1.838
47. Perangin-angin N, Saragih J, Lismawati. Hubungan Dukungan Keluarga dengan Harga Diri Pasien TB Paru di Rumah Sakit Tentara Tingkat IV Pematang Siantar. J Ilmu Kesehat dan Gizi [Internet]. 2023;1(1):9–29. Available from: https://prin.or.id/index.php/jig/article/view/781/836
48. Maelani T, Cahyati WH. Karakteristik Penderita, Efek Samping Obat dan Putus Berobat Tuberkulosis Paru. Higeia J Public Heal Res Dev [Internet]. 2019;3(2):227–38. Available from: https://journal.unnes.ac.id/sju/index.php/higeia/article/view/31852
49. Aini L, Astuti L. Hubungan antara Efek Samping Obat Anti Tuberculosis (OAT) dan Peran Pengawas Menelan Obat (PMO) dengan Kepatuhan Pengobatan pada Penderita Tuberculosis (TB) Paru. Bablul Ilmi J Ilm Multi Sci Kesehat [Internet]. 2020;12(2):24–34. Available from: https://jurnal.stikes-aisyiyah-palembang.ac.id/index.php/Kep/article/view/935
50. Ardat. Pengaruh Pengetahuan dan Sikap terhadap Kepatuhan Minum Obat Pada Penderita TB Paru. J Pharm Heal Res [Internet]. 2020;1(2):49–53. Available from: https://journal.iktgm.ac.id/index.php/nursing/article/view/69
51. Dwiningrum R, Wulandari RY, Yunitasari E. Hubungan Pengetahuan dan Lama Pengobatan TB Paru dengan Kepatuhan Minum Obat pada Pasien TB Paru di Klinik Harum Melati. J Aisyah J Ilmu Kesehat [Internet]. 2021;6:209–14. Available from: https://aisyah.journalpress.id/index.php/jika/article/view/6S137
52. Panggayuh PL, Winarno M., Tama TD. Faktor yang Berhubungan dengan Keberhasilan Pengobatan Tuberkulosis Paru di Rumah Sakit Umum Karsa Husada Batu. Sport Sci Heal [Internet]. 2019;1(1):28–38. Available from: http://journal2.um.ac.id/index.php/jfik/index