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Correlation between Adherence and Effectiveness of Tuberculosis Medication Use among Patients

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Abstract

Indonesia has become the country with the second highest number of tuberculosis cases in the world. In 2021, Indonesia recorded an incidence of 397,377 cases, with a significant number of cases originating from Tegal, Central Java, which reported 980 cases. The purpose of this study is to determine the compliance and effectiveness of TB medication usage and to examine the relationship between compliance, effectiveness, and patient sociodemographics. The study population consists of tuberculosis patients at the Tegal Selatan Community Health Center who underwent treatment from September 2023 to February 2024. The research method is quantitative causal. Data collection was conducted both retrospectively and prospectively. Compliance data were obtained through the MMAS-8 questionnaire, and effectiveness data were gathered by recording follow-up sputum examinations using the SITB (Tuberculosis Information System) software. The study included 30 respondents, with 50% male and 50% female. The majority (63.3%) were middle-aged adults (41-60 years old), 63.3% had less than 9 years of education, 60% were employed, 93.3% had an income at or below the minimum city wage, and 70% had 1-3 family dependents. 76.7% of respondents exhibited high compliance, 20% had moderate compliance, and 3.3% had low compliance. The effectiveness of medication usage was 96.7%. Chi-square analysis (95% CI) revealed a strong correlation between compliance and effectiveness with r = 0.707 (p-value = 0.033), and there was no significant relationship between patient sociodemographics and both compliance and effectiveness.

Introduction

Pulmonary tuberculosis has emerged as a global health concern, with high incidence rates contributing significantly to mortality worldwide. According to the World Health Organization's Global Tuberculosis Report 2022, in 2021, Indonesia ranked as the second-highest country in the world for tuberculosis cases after India, with an incidence of 397,377 cases. The provinces with the highest population density and tuberculosis cases are West Java, Central Java, and East Java. These three provinces contribute to 44% of tuberculosis cases in Indonesia (Dinkes Kota Tegal, 2022).

Case Notification Rate (CNR) represents the total number of tuberculosis cases treated and reported per 100,000 population in a specific area. Indonesia experienced an increase in CNR in 2021, reaching 146 per 100,000 population, compared to the CNR of 130 per 100,000 population in 2020 (Kemenkes RI, 2022). Case notification rate (CNR) in Central Java is 110 per 100,000 population. The highest number of cases occurred in the city of Tegal, reaching 716.5 per 100,000 population. The success rate of TB treatment in Central Java in 2021

experienced a decrease, which was 83.5% compared to 84.8% in 2020 (Dinkes Jawa Tengah, 2022).

Based on the health profile data of Central Java in 2021, the highest tuberculosis cases were found in the city of Tegal, with an estimated number of smear-positive cases (BTA +) reaching 980, and successfully detected (CNR) at 458 cases. In 2020, the number of TB cases was 633, indicating an increase in tuberculosis cases in 2021. This signifies that pulmonary tuberculosis remains a health issue, particularly in the city of Tegal (Dinkes Kota Tegal, 2022).

The aim of TB treatment is to cure patients, prevent death, avoid relapse, reduce TB transmission chains, and prevent drug resistance. Without appropriate treatment, these goals cannot be achieved, and incomplete treatment can lead to dangerous complications (Kemenkes RI, 2019). Tuberculosis is considered cured when sputum re-examination after 6 months of treatment shows BTA conversion. BTA conversion serves as a crucial indicator for evaluating the success of tuberculosis treatment (Mahendrani et al., 2020). Lack of patient compliance in taking TB medication can be a cause of the increase in tuberculosis cases.

In a study by Supartiningsih and Ainun, the compliance rate of pulmonary TB patients was reported to be 75% (Supartiningsih & Ainun, 2021). Subsequently, research by Jamaluddin indicated a compliance rate of 50% for pulmonary TB (Jamaluddin, 2019). However, in Delani's study, the compliance rate of pulmonary TB patients decreased to 46% (Delani et al., 2022). Non-compliance can be caused by the prolonged duration of TB treatment, leading patients to feel bored and weary, prompting them to stop taking medication because they feel healthy, lack of family support, especially in Directly Observed Treatment (DOT), and insufficient knowledge about the treatment (Syafruddin et al., 2022).

Pulmonary TB is an infectious disease, making effective treatment and patient compliance with antituberculosis medication crucial for analysis. Furthermore, there is a lack of research regarding the relationship between compliance and effectiveness of TB medication usage among TB patients at the Tegal Selatan Community Health Center, Therefore, the researchers aim to investigate the compliance and effectiveness of TB medication usage, to ascertain the relationship between compliance and effectiveness of TB medication usage, as well as to investigate the correlation between sociodemographic factors and TB patient compliance and effectiveness. The hypothesis of this research is that there is a relationship between compliance and effectiveness of tuberculosis medication usage among tuberculosis patients at the Tegal Selatan Community Health Center.

Methods

This research employs a causal quantitative method as it aims to investigate the correlation between medication adherence and treatment effectiveness. Data collection is conducted both retrospectively and prospectively. Treatment effectiveness data is obtained by reviewing sputum examination records in the SITB software at the beginning of the first, second, fifth, and/or sixth month of pulmonary TB treatment. Adherence data is gathered using the MMAS-8 questionnaire administered upon completion of the effectiveness data collection. The collection of adherence data following the completion of TB treatment is expected to yield accurate data that reflects the true condition. Adherence data analysis involves calculating the total adherence scores, while effectiveness analysis utilizes Microsoft Excel software. Treatment outcomes data are compared with existing literature. The relationship between adherence and pulmonary TB treatment effectiveness is analyzed using the chi-square method, correlation, and odds ratio.

The study population involves tuberculosis patients at Tegal Selatan and Bandung Community Health Centers. Sampling was conducted using purposive sampling method, with a total of 30 respondents selected. The inclusion criteria comprised patients undergoing pulmonary TB treatment between September 2023 and February 2024, with a minimum of two sputum

examinations and receiving Category I TB treatment. Exclusion criteria included incomplete patient data and patients who discontinued treatment.

The research commenced with a preliminary study to gather information regarding tuberculosis in the area. Subsequently, Ethical Clearance was sought from the Research Ethics Committee of the Faculty of Pharmacy, YPIB Majalengka University, with approval granted under reference number 039/KEPK/EC/XII/2023. Ethical Clearance is issued for research involving living beings, indicating that a study is deemed suitable for implementation. Ethical principles prioritize the safety and well-being of respondents, ensuring that before the research begins, relevant information about the study is provided through informed consent, maintaining respondent confidentiality, and affirming the right to withdraw from the study at any time without any consequences (KEPPKN, 2017), Subsequently, the research permit application is initiated by providing a letter requesting research recommendation from YPIB University to the Office of National Unity and Politics of Tegal City, as well as to the Health Office of Tegal City. Following this, the research permit letter is then handed over to both Tegal Selatan and Bandung Community Health Centers.

Respondent classification encompasses gender, age, education, duration of treatment, occupation, income, and the number of dependents in the family. The collection of sociodemographic data is conducted to determine whether there is any correlation between sociodemographic factors and adherence or effectiveness. The analysis employs SPSS utilizing the chi-square method, correlation, and odds ratio. Furthermore, research data collection involves adherence data using the MMAS-8 questionnaire in Bahasa Indonesia version, with a Cronbach's α value of 0.759 and good test-retest reliability of 0.860 (Vika et al., 2016). A study by Faisal et al. (2021) on medication adherence among TB patients found that MMAS-8 was effective in identifying patients' adherence levels before and after receiving education and interactive nursing reminders.

The effectiveness data involves re-examination of sputum through the Tuberculosis Information System (SITB) software. Based on Minister of Health Regulation No. 67 of 2016 concerning Tuberculosis Control, the recording and reporting of TB incidents utilize the Integrated Tuberculosis Information System (SITT), Since 2020, SITT has been replaced by the Tuberculosis Information System (SITB). SITB is a mandatory system used by healthcare facilities, including Community Health Centers (Puskesmas) and hospitals, for tuberculosis control. This system is utilized for the recording, data processing, and reporting related to tuberculosis data. The data entered or inputted into SITB includes sociodemographic information and medical data related to patient healthcare services or treatment (Syam & Nurfita, 2022). The MMAS-8 questionnaire will provide data on patients' behavior and adherence in using TB medication, while the SITB software provides data on repeat sputum examinations that indicate TB treatment outcomes. These research instruments will support this study.

Result and Discussion

Respondents' Sociodemographic Characteristics

In this study, a sample of 30 respondents with a treatment duration of 6 months was obtained. An overview of the distribution of research respondents' characteristics can be seen in the table below:

Table 1. Sociodemographic Characteristics of Tuberculosis Patients

Patient Characteristics	Frequency (N=30)	Percentage (%)
Gender		

a. Male	15	50%
b. Female	15	50%
Age (Years)		
a. Early adulthood (20-40)	7	23,3%
b. Middle adulthood (41-60)	19	63,3%
c. Late adulthood (> 61)	4	13,3%
Level of Education		
a. Incomplete Elementary School	1	3,3%
b. Elementary School	13	43,3%
c. Junior High School	5	16,7%
d. Senior High School	10	33,3%
e. Diploma	1	3,3%
Occupation		
a. Unemployed	1	3,3%
b. Housewife	10	33,3%
c. Retiree	1	3,3%
d. Laborer	6	20%
e. Private Employee	12	40%
Income		
a. ≤ Minimum City Wage (UMK)	28	93,3%
b. > Minimum City Wage (UMK)	2	6,7%
Number of Family Dependents		
a. No family dependents	5	16,7%
b. Small family dependents (1-3)	21	70%
c. Medium family dependents (3-6)	4	13,3%

Source: Research Data Analysis Results

Sociodemographic Characteristics Based on Gender

Based on Table 1, it is evident that the number of TB patients is balanced between male and female patients. The findings of this study are consistent with the research by Arimaswati et al. (2022), which had a 1:1 sample ratio. The occurrence of tuberculosis in men is associated with their higher mobility and activities outside the home, considering that men often serve as the heads of households, which may lead to contracting TB in the workplace (Saraswati et al., 2022) furthermore, smoking habits can lead to respiratory system disorders (Nurjannah & Sudana, 2017).

In women, the occurrence of tuberculosis can be attributed to their tendency to stay indoors with poor ventilation and lighting conditions, which increases the likelihood of contracting TB. The function of ventilation is to circulate air inside the house. The ideal ventilation is 10% of the floor area (Muslih et al., 2018).

Sociodemographic Characteristics Based on Age

Based on Table 1, the majority of TB cases were found in the age group of 41-60 years, comprising 19 respondents (63.3%). Pulmonary TB typically occurs during the productive age range of 15-50 years due to their mobility. A person's immune system tends to weaken after the age of 55, leading to an increased risk of developing various diseases, including pulmonary TB (Sikumbang et al., 2022).

Sociodemographic Characteristics Based on Education Level

Based on Table 1, 19 patients (63.3%) had ≤9 years of education (incomplete elementary school, elementary school, or junior high school), while 11 patients (36.3%) had >9 years of education. The higher the level of education, the more developed one's mindset becomes, which will also affect awareness of personal and family health, leading to anticipation of the occurrence of a disease (Yusuf, 2019).

Sociodemographic Characteristics Based on Occupation

Based on Table 1, 18 patients (60%) work as laborers or in the private sector, while 11 patients (39.9%) are unemployed, including housewives, unemployed individuals, and retirees. The majority of tuberculosis patients are employed. Individuals who spend a lot of time and energy working may experience fatigue and a lack of rest, which can weaken the immune system, especially if they work in crowded environments and interact with many people who may potentially be suffering from TB, This increases the likelihood of TB infection (Ranteallo et al., 2021).

Sociodemographic Characteristics Based on Income

Based on Table 1, it is evident that the majority of TB patients have income ≤ Minimum City Wage (UMK), totaling 28 individuals (93.3%). The health status of the community is greatly influenced by socio-economic conditions, and the consumption patterns of individuals and families are also affected by income. Families with incomes below the Minimum City Wage (UMK) often consume food that does not meet nutritional needs, which can be a contributing factor to the susceptibility of individuals to pulmonary TB (Widyastuti et al., 2018).

Sociodemographic Characteristics Based on Family Size

Based on Table 1, it is known that the majority of patients have a family size ranging from 1 to 3 dependents, totaling 21 individuals (70%). When a family has more members, the burden of meeting living needs becomes greater. Income influences meeting family needs, where consumption levels increase. If there is a lack of nutritional intake, it can facilitate the occurrence of pulmonary TB infection (Widyastuti et al., 2018).

Research Findings: Compliance and Effectiveness Data

Patient Compliance Data in the Use of TB Medication

The level of adherence among tuberculosis patients is detailed in the following table:

Table 1. Distribution of MMAS-8 Questionnaire Completion Results

Questions	Answers	
	Yes (%)	No (%)
Do you sometimes forget to take your anti-tuberculosis medicine?	6,7%	93,3%
People sometimes miss taking their medicines for reasons other than forgetting.Thinking over the past two weeks, were there any days when you did not take your anti-tuberculosis medicine?	6,7%	93,3%
Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?	3,3%	96,7%
When you travel or leave home, do you sometimes forget to bring along your anti-tuberculosis medicine?	0%	100%
Did you take your anti-tuberculosis medicine yesterday?	93,3%	6,7%
When you feel like your condition is under control, do you sometimes stop taking your medicine?	6,7%	93,3%

Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your tuberculosis treatment plan?	3,3%	96,7%
How often do you have difficulty remembering to take all your tuberculosis medicine? a. Never b. once c. Sometimes d. Usually e. Always	Never = 100%	

Source: The MMAS-8 questionnaire and Research Data Analysis Results

Based on Table 2, it is evident that the majority of patients consistently take their TB medication according to the prescribed regimen. However, there are issues with medication usage, namely patient non-compliance as indicated by items number 1,2,5, and 6. Patient non-compliance is caused by forgetting to take medication, patients stopping medication after feeling better, and side effects.

The support from health center staff is crucial in enhancing compliance by providing counseling and information regarding medication, its side effects, and treatment duration. Family support or the presence of a PMO (Medication Adherence Supporter) plays a crucial role in the success of treatment. Long-term treatment can lead patients to feel bored and weary. Having a PMO who monitors, reminds, and accompanies them can help improve treatment adherence (Pasaribu et al., 2023).

The distribution of adherence levels to OAT among tuberculosis patients can be seen in the following table:

Table 2. Level of Adherence to Tuberculosis Medication Usage

No	Adherence Level	Total	Percentage
1	High	23	76,7 %
2	Moderate	6	20 %
3	Low	1	3,3 %
Total		30	100 %

Source: Research Data Analysis Results

Based on Table 3, it is evident that the majority of tuberculosis patients exhibit a high level of adherence, with 23 individuals (76.7%) demonstrating this behavior. High adherence can be influenced by the desire for recovery, family support, PMO (Directly Observed Treatment, Short-course), and the healthcare workers at the health center. High adherence significantly contributes to optimal treatment outcomes (Ahdiyah et al., 2022).

Effectiveness Data of TB Medication Use Among Patients

Overview of the effectiveness of tuberculosis treatment is presented in the following table:

Table 3. Distribution of TB Treatment Effectiveness Results

No	Effectiveness	Total	Precentage
1	Effective	29	96,7 %
2	Ineffective	1	3,3 %
Total		30	100 %

Source: Research Data Analysis Results

Based on Table 4, the data on effectiveness indicate that 29 individuals (96.7%) are effectively using TB medication. The effectiveness of TB medication usage in tuberculosis patients is determined through sputum conversion. One sign of successful TB treatment is the conversion of sputum to negative for acid-fast bacilli (AFB). Successful treatment will yield negative AFB sputum results after the intensive treatment phase (Agustin et al., 2023 & Putra et al., 2021).

Analysis of the Relationship Between Compliance, Effectiveness, and Sociodemographics

The Relationship Between Compliance and Effectiveness

The relationship between compliance and the effectiveness of TB can be observed in the following table:

Table 4. The Relationship Between Compliance and the Effectiveness

Compliance	Effectiveness		Total	OR (CI 95%)	r	P value
	Not effective	Effective				
Non-compliant	1	0	1	29,00	0,707	0,033
Compliant	0	29	29			
Total	1	29	30			

Source: Research Data Analysis Results

Based on table 5, the chi-square test analysis yielded a value of 0.033 (sig<0.05), indicating that the research hypothesis is accepted, which is the existence of a relationship between compliance and effectiveness of tuberculosis medication usage among tuberculosis patients at the Tegal Selatan Sub-district Health Center with a strong association (r=0.707). The result is consistent with the research Masiroh (2023) There is a relationship between sputum BTA conversion and the success rate of treatment, as well as the studies by Meyrisca & Susanti (2022) and Yudiana et al. (2022).

The odds ratio (OR) indicates that individuals who comply with TB medication are 29 times more likely to be effective compared to those who do not comply. Compliance with medication usage is one of the determining factors for the effectiveness of treatmentNon-compliance can result in the failure of TB therapy. The desire to recover and self-motivation support patients in becoming compliant; the more compliant the patient, the higher the likelihood of treatment success (Meyrisca & Susanti, 2022).

The Relationship Between Sociodemographic Characteristics and Compliance

The relationship between the sociodemographic characteristics of patients and compliance with TB medication usage can be observed in the following table:

Table 5. The Relationship Between Patient Sociodemographic Characteristics & Compliance

Category		Compliance		OR (CI 95%)	r	P value
		Non-Compliance [n (%)]	Compliance [n (%)]			
Gender	Male	1 (7)	14 (93)	0,933 (0,815-1,069)	0,183	1,000
	Female	0 (0)	15 (100)			
Age	> 45	1 (6)	17 (94)	0,944 (0,844-1,056)	0,150	1,000
	≤ 45	0 (0)	12 (100)			
Education Level	≤ Junior high school	1 (5)	18 (95)	0,947 (0,852-1,053)	0,140	1,000
	> Junior high school	0 (0)	11 (100)			

Occupation	Employed	1 (6)	17 (94)	0,944 (0,844-1,056)	0,150	1,000
	Unemployed	0 (0)	12 (100)			
Income	≤ UMK	1 (4)	27 (96)	0,964 (0,898-1,036)	0,050	1,000
	> UMK	0 (0)	2 (100)			

Source: Research Data Analysis Results

The Relationship Between Sociodemographic Characteristics and Compliance Based on Gender

The Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between gender and compliance, with a very weak correlation (r=0.183). These results are consistent with the research Sholichah et al. (2020). The odds ratio (OR) indicates that males are at a risk of 0.933 times experiencing non-compliance with TB medication compared to females. This could be attributed to the fact that males tend to pay less attention to their health due to leading unhealthy lifestyles, while females are more diligent and attentive to their health (Rahmi, 2020).

The Relationship Between Sociodemographic Characteristics and Compliance Based on Age

Based on Table 6, the majority of respondents are over 45 years old. This could be due to the fact that in the elderly age group, there is a decline in the immune system (Lestari et al., 2022). he Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between age and compliance, with a very weak correlation (r=0.150). These results are consistent with Rahmi (2020) This suggests that all age groups may exhibit similar behaviors to achieve recovery. The odds ratio (OR) indicates that individuals over 45 years old are at a risk of 0.944 times experiencing non-compliance compared to those aged 45 or younger. Non-compliance with treatment may occur due to forgetfulness or resignation towards the illness suffered (Sutrisna & Rahmadani, 2022).

The Relationship Between Sociodemographic Characteristics and Compliance Based on Education Level

Table 6 shows that the Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between education level and compliance, with a very weak correlation (r=0.140), These results are consistent with the research by Rusman & Basri K (2019). Compliance can be shaped by the information about TB provided by health center staff (Dewi, 2021). The odds ratio (OR) indicates that patients with an education level of ≤ Junior High School are at a risk of 0.947 times experiencing non-compliance compared to those with an education level of > Junior High School. Someone with a higher education tends to actively absorb various information that enhances awareness in maintaining health (Yusuf, 2019).

The Relationship Between Sociodemographic Characteristics and Compliance Based on Occupation

Table 6 shows that the Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between occupation and compliance, with a very weak correlation (r=0.150). These results are consistent with the research by Nailius & Anshari (2022). The odds ratio (OR) indicates that working patients are at a risk of 0.944 times experiencing non-compliance compared to patients who are not employed. This could be due to the type of occupation and the busyness at work resulting in forgetfulness or patients not having time to take medication (Bakhtiar et al., 2021).

The Relationship Between Sociodemographic Characteristics and Compliance Based on Income

Table 6 shows that the Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between income and compliance, with a very weak correlation (r=0.050). These results are consistent with the research by Nailius & Anshari (2022) suggesting that although the income is ≤ city minimum wage (UMK), since TB treatment does not incur expenses, patients may still make efforts to obtain medication. The odds ratio (OR) indicates that individuals with income ≤ city minimum wage (UMK) are at a risk of 0.964 times experiencing non-compliance compared to those with income > city minimum wage (UMK). This could be due to the potential barrier of transportation costs associated with treatment (Ruditya, 2015).

The Relationship Between Sociodemographic Characteristics and Effectiveness

The relationship between patient sociodemographic characteristics and the effectiveness of TB medication usage can be observed in the following table:

Table 6. The Relationship Between Patient Sociodemographic Characteristics and Effectiveness

Category		Effectiveness		OR (CI 95%)	r	P value
		Not Effective [n (%)]	Effective [n (%)]			
Gender	Male	1 (7)	14 (93)	0,933 (0,815-1,069)	0,183	1,000
	Female	0 (0)	15 (100)			
Age	> 45	1 (6)	17 (94)	0,944 (0,844-1,056)	0,150	1,000
	≤ 45	0 (0)	12 (100)			
Education Level	≤ Junior high school	1 (5)	18 (95)	0,947 (0,852-1,053)	0,140	1,000
	> Junior high school	0 (0)	11 (100)			
Occupation	Employed	1 (6)	17 (94)	0,944 (0,844-1,056)	0,150	1,000
	Unemployed	0 (0)	12 (100)			
Income	≤ UMK	1 (4)	27 (96)	0,964 (0,898-1,036)	0,050	1,000
	> UMK	0 (0)	2 (100)			

Source: Research Data Analysis Results

The Relationship Between Sociodemographic Characteristics and Effectiveness Based on Gender

Based on Table 7, the Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between gender and effectiveness, with a very weak correlation (r=0.183). These results are consistent with the research by Mahendrani et al. (2020). This is because both males and females have an equal likelihood of being aware of the importance of regularly taking medication, receiving support, and information (Ruditya, 2015). The odds ratio (OR) indicates that males are at a risk of 0.933 times experiencing ineffectiveness in TB medication usage compared to females. This could be due to irregularity in taking TB medication and the tendency of males to smoke more, which can affect sputum BTA conversion (Mahendrani et al., 2020).

The Relationship Between Sociodemographic Characteristics and Effectiveness Based on Age

Based on Table 7, the Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between age and effectiveness, with a very weak correlation (r=0.150). These results are consistent with the research by Chusna & Fauzi (2021). The odds ratio (OR) indicates that individuals over 45 years old are at a risk of 0.944 times experiencing ineffectiveness compared to those aged 45 or younger. This could be because of irregular TB medication intake and the decline in the immune system as individuals age, which may disrupt the results of follow-up sputum examination conversion (Susilawati et al., 2023).

The Relationship Between Sociodemographic Characteristics and Effectiveness Based on Education Level

Based on Table 7, the Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between education level and effectiveness, with a very weak correlation (r=0.140). These results are consistent with the research by Chusna & Fauzi (2021). The odds ratio (OR) indicates that patients with an education level of ≤ Junior High School are at a risk of 0.947 times experiencing ineffectiveness compared to those with an education level of > Junior High School. A person's low level of education can affect their knowledge about TB treatment, which can lead to patients not adhering to TB medication regularly, resulting in non-conversion (Agustin et al., 2023)**.**

The Relationship Between Sociodemographic Characteristics and Effectiveness Based on Occupation

Based on Table 7, the Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between occupation and effectiveness, with a very weak correlation (r=0.150). These results are consistent with the research by Chusna & Fauzi (2021). The odds ratio (OR) indicates that working patients are at a risk of 0.944 times experiencing ineffectiveness compared to patients who are not employed. This could happen because individuals who are busy with work may forget or not have time to take medication. Irregular medication intake can affect the outcome of TB treatment (Novera et al., 2023).

The Relationship Between Sociodemographic Characteristics and Effectiveness Based on Income

Based on Table 7, the Chi-Square test yielded a value of 1.000, which is greater than 0.05, indicating no relationship between income and effectiveness, with a very weak correlation (r=0.050). These results are consistent with the research by Rahmah et al. (2018) suggest that this could be due to the TB treatment program not incurring costs for TB medication and follow-up sputum examinations, allowing patients to regularly take TB medication. The odds ratio (OR) indicates that individuals with income ≤ city minimum wage (UMK) are at a risk of 0.964 times experiencing ineffectiveness compared to those with income > city minimum wage (UMK). This may be because patients with low income can affect the cost of transportation to the health center and the fulfillment of poor nutritional intake can have an impact on the health of TB patients and the failure of sputum conversion (Mahendrani et al., 2020).

Conclusion

The compliance with TB medication among TB patients is as follows: 76.7% of respondents have high compliance, 20% have moderate compliance, and 3.3% have low compliance, the effectiveness of TB medication usage is 96.7%. There is a relationship between compliance and the effectiveness of TB medication usage among TB patients at the Tegal Selatan Sub-district Health Center, there is no relationship between sociodemographic factors and the compliance and effectiveness of TB medication usage among TB patients at the Tegal Selatan Sub-district Health Center.

Suggestion

Patients are encouraged to maintain compliance with TB medication, while health centers are encouraged to uphold the quality of healthcare services. For future researchers, further studies can be conducted on evaluating compliance and effectiveness among TB-RO patients.

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