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The Correlation Between Health Locus of Control and Compliance In Taking Medication Toward Patients With Tuberculosis in the Working Area of Nosarara Public Health Center, Palu Central Sulawesi

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ABSTRACT

Background: Nosarara Public Health Center (PHC) is one of PHC that has the highest tuberculosis cases in Palu, and during 2023 had 81 cases, which about 34 (45%) patients who successfully recovered, 2 patients died, and 45 (55%) patients who were still on treatment. However, only 11 patients who underwent 6 months of the treatment process. The purpose of this study was to determine the correlation between Health locus of control with compliance in taking medication in Tuberculosis patients in the Nosarara Public Health Centre.

Methods: This is a quantitative study with an analytical observational design with a cross-sectional approach. The total of population in this study were 81 TB patients who undergoing treatment at the Nosarara Public Health Centre, and the total of sample were 67 respondents that were taken by using the Slovin formula, and data analysis by using the Chi-square test.

Results: This study shows that most respondents have a good Health Locus of Control (41.8%) and for treatment compliance category had non-compliant (62.7%), the results of the chi-square test of Health Locus of Control with compliance in taking medication = 0.000 <0.05 which indicates had a significant correlation.

Conclusion: There is a correlation between health locus of control and medication compliance toward Tuberculosis patients in the Nosarara Public Health Centre working area.

Suggestion: It is expected for patients to always cooperate and improve compliance so that Tuberculosis disease can be resolved properly.

INTRODUCTION

The top cause of death and the main cause of infectious disease agents that exceed *human immunodeficiency virus / acquired immune deficiency syndrome* (HIV/AIDS) infection is *tuberculosis* (TBC). Every year, millions of people become infected with *tuberculosis*. Around 10.0 million (range, 9.0–11.1 million) 2 people became infected *with tuberculosis* (TB) in 2021, this figure is estimated to be quite stable in recent years. For the countries with the most patients, the burden of disease varies greatly from five to more than 500 new cases per 100,000 population per year, with an average of about 130 cases globally. Approximately 1.2 million (range, 1.1-1.3 million) TB deaths among people not infected with HIV in 2021, and an additional 251,000 deaths (range, 223,000-281,000) 3 among people infected with HIV *Tuberculosis* cases are common in older people. (Civilization, TEMA 19 and Domenico, 2021)

Tuberculosis cases are found in all countries and age groups, but in general, 90% of cases are adults (aged ≥15 years), 9% are HIV-infected people (72% in Africa) and two-thirds of them are found in eight countries: 27% in India, 9% in China, 8% in Indonesia, 6% in the Philippines, 5% in Pakistan, 4% in Nigeria, 4%

in Bangladesh and 3% in South Africa. According to the WHO, these countries along with 22 other countries out of 30 countries with a high TB burden contribute to 87% of the world's cases. In the European region, 6% *of tuberculosis* cases are detected globally and in the 3% region in the Americas, *tuberculosis* does not only occur in foreign countries but also in Indonesia. (Civilization, TEMA 19 and Domenico, 2021) Globally, Indonesia is in third place after India and China with the most TB cases in the world. Based on data from the Ministry of Health (Kemenkes) in 2021, Indonesia itself currently reaches 842,000. A total of 442,000 people with Pulmonary TB reported and about 400,000 others did not report or were not diagnosed. The patients with pulmonary TB consist of 492,000 men, 349,000 women, and around 49,000 children. It is recorded as one of the largest provinces in tuberculosis cases. (Civilization, TEMA 19 and Domenico, 2021)

Central Sulawesi Province experienced an increase in the number of *case detection rate* (CDR) discoveries in 2020 from 59% to 69% in 2021. The number of CDR cases in 2021 was 10,207 with a comparison of 345/100,000. People who suffer from pulmonary TB in general often have a perception of the disease they are experiencing, will control their own disease and take responsibility for the illness they experience, feeling ashamed, with their condition. And feel that the disease suffered will be a burden for the people around him (Central Sulawesi Provincial Health Office)

Health Locus Of Control (HLOC) is a form of perception in individuals that refers to the experiences and beliefs they have about the underlying causes of events in their lives (Sumijah, 2020). It is divided into two types (HLOC), namely *the Internal Health locus of control* (IHLC) and the external *health locus of control* (EHLC). An individual *with an internal health locus of control* will have enough confidence that he or she will control his or her illness as well as be responsible for his or her health. So individuals will be responsible and confident in their health. Meanwhile, individuals with an external *health locus of control* have the belief that their health depends on others, such as health workers, friends, family members and creators. (Wianti, 2020).

A study conducted in 2021 found that there was a significant positive relationship between the dimensions of Internal *Health Locus Of Control* (IHLOC) and medication adherence with a correlation value of r = 0.576 and p > 0.05) and contributed 33.1% to medication adherence. This means that the correlation value of the IHLOC dimension and medication adherence is relatively strong. The higher the IHLOC dimension score, the higher the level of adherence to taking medication in TB patients. Individuals who have an internal orientation will adhere more to their own treatment regimen than individuals with oxternal orientation (Pramesti, 2021).

Based on the preliminary study conducted by the researcher, data was obtained that the Nosarara Health Center, which is the health center with the highest tuberculosis cases in the city of Palu, recorded 81 cases of pulmonary TB from January to December 2023 where the results obtained were that 34 (45%) people were successfully cured, 2 people died and 45 (55%) people were still under treatment. Meanwhile, 11 people underwent treatment for 6 months and 1 person died. The results of interviews with seven pulmonary TB patients, four patients said they were not compliant because they took drugs as recommended by health workers. Patients said that the reason they no longer took medicine was because they were bored with the old TB treatment program, felt uncomfortable with the side effects caused by the drug, and forgot to take medicine when traveling long distances, 3 patients said they were lazy to take medicine because the location of the health center was too far from the location of the patient's home and 1 health worker named Dewi who was at the Nasorara Health Center said that for pulmonary TB visits were mostly in patients who broke medicine.

RESEARCH METHODOLOGY

This study is a type of quantitative research with an analytical observational design with a *cross sectional* approach, which is research conducted at a certain time, and aims to find out whether the two variables, namely independent (free) and dependent (bound) variables, have a relationship or not (Anggreni, 2022)

This research was carried out in the Nosarara Health Center Working Area. This research was carried out from 02 to 19 August 2024. The research sample is 67 samples, this study uses the slovin formula with a *margin of error* of 5%.

Data Analysis

Univariate analysis

Univariate analysis in this study is an analysis used to analyze each variable of the research results that realize a distribution of frequencies and achievements of each variable. The independent variable (*Health locus of control*) and dependent variable (Medication adherence) formula used to calculate the frequency of each variable are (Anggreni, 2022).

Bivariate analysis

The bivariate analysis used in this study is the chi-square test. The data that the bivariate wants to analyze is the relationship between independent variables (*health locus of control*) and dependent variables (medication adherence) in pulmonary TB patients (Anggreni, 2022).

RESULTS AND DISCUSSION

This research began by visiting the UPT at the Nosarara Health Center and visiting the Homes of Residents who suffered from *Tuberculosis*. This research was carried out by requesting research permission from the Nosarara Health Center and conducting research trips to *Tuberculosis* patients in Tavanjuka, Palupi, and Pengawu villages with a rare initial request for approval from *Tuberculosis* patients and signing an *informed consent* sheet and then filling out a research questionnaire on *Health Locus Of Control* and Medication Compliance. So in the data collection that has been carried out, the following results are obtained:

Univariate Characteristics
Characteristics of respondents based on age. Gender, and Occupation

Table 1. Characteristics of respondents by age, gender, education, and occupation in 2024

Characteristics Respondents	Frequency (f)	Percentage (%)
Age (Years)		
16-30	12	17.9
31-55	24	35.8
56-70	31	46.3
Gender		
Male	29	43.3
Women	39	56.7
Education		
SD	10	14.9
Junior High School	5	7.5
High School	22	32,8
College	30	44.8
Jobs		
Not working	36	53.7
Civil Servant/TNI Polri	2	3.0
Self-employed	20	29.9
Farmer	9	13.4

Overall total of 67 (100%) Source: Primary Data 2024

Based on the description of table 1, it is explained that the results of the 67 respondents with characteristics based on age are the most in the age category of 56-70 years with a total of 31 people (46.3%), based on gender with the most in the female category with 39 respondents (56.7%), based on education with the most in the category of universities with a total of 30 people (44.8%), based on the most unemployed jobs with a total of 36 respondents (53.7%).

Health Locus Of Control

Table 2. Distribution of respondents by *health locus of control* in 2024

Health locus Of Control	Frequency	Presentation (%)
Good	28	41,8
Less	39	58,2

Overall total of 67 (100%). Primary Data Sources 2024

Based on table 2 of 67 respondents, judging from the *variable health locus of control*, respondents who have *a health locus of control* are less than 39 respondents (58.2%) and respondents who have good as many as 28 respondents (41.8).

Medication Compliance

Table 3. Distribution of respondents by medication adherence in 2024

Medication adherence	Frequency	Presentation (%)
Obedient	25	37,3
Non-compliant	42	62,7

Overall total of 67 (100%). Primary Data Sources 2024

Based on table 3 of the 67 respondents, it is seen from the *drug compliance variable* of respondents who do not comply with 42 respondents (62.7%) and respondents who comply with 25 respondents (37.3%).

Bivariate analysis

Table 4. The relationship between *health locus of control* and medication adherence in *Tuberculosis patients* in the work area of the Nosarara Health Center

Health locus of control[b]	Medication adherence[c]				Total		*P Value*
	Obedient		Non-compliant				
	fd	%e	f	%	f	%	
Good	18	26,9	10	14,9	28	41,8	
Less	7	10,4	32	47,8	39	58,2	0.000f
Total	25	37,3	42	62,7	67	100	

aTotal overall sample 67 (100%), bHealth *Locus of Control,* cKnowledge of Taking Medication, df=frequency, ePercentage, fUji *Chi-square*, significant if p<0.000. Primary Data Sources 2024

Based on Table 4, it shows that of the respondents who have *a health locus of control*, both with medication compliance, namely 18 respondents (26.9%), while those who do not comply are 10 respondents (14.9%), respondents who have *a health locus of control* are less with medication compliance, 7 respondents (10.4%) while those who do not comply are less (47.8%). Based on statistical analysis using *the Chi square* test, a p-value *of <0.000 was obtained*. From the results of the *Chi-Square test* obtained, it can be concluded that there is a relationship *between Health Locus Of Control* and medication compliance in *Tuberculosis patients* in the Nosarara Health Center Working Area.

Based on the analysis data, using a master table to see the *Health Locus of Control* factor in patients through the percentage of sub-categories, the results obtained were that respondents who had *a health locus of control* with adherence to taking medication, namely more dominant to *Powerful others locus of control* amounted to 66.85% *internal health locus of control* while *chance health locus of control* 58,58%.

Discussion

Health Locus Of Control experienced by Tuberculosis patients in the Working Area of the Nosarara Health Center

The results of the analysis of Univariate of this study showed that the results of the health *locus of control* research on *Tuberculosis patients* in the Working Area of the Nosarara Health Center using a questionnaire sheet obtained the results that those who had *a health locus of control* were less than 39 respondents (58.2%) and respondents who had good as many as 28 respondents (41.8).

The researcher's assumption is that from the results of the study, *the health locus of control* with the category of less can be caused by the respondents' work factors, where the average respondent does not work as many as 36 respondents (56.7%). A person who does not work tends to have less desire to control his own health because he feels fine if he is sick and is at home. So it will be difficult to make decisions related to their health without depending on others. Having a job also increases a person's knowledge considering that the form of social life with the people around them will increase information and knowledge, especially health issues, so that people who do not work will be less likely to have *health of control*.

Saputra and Herlina, (2021) stated that job status is related to self-actualization and encourages individuals to be more confident and responsible in solving health problems so that their self-confidence increases. Working TB patients tend to have the ability to change lifestyle and have the experience to know the signs and symptoms of the disease.

The results of this study are in line with research by Anindita Dwi Pramesti, (2019) regarding "The Relationship between *Health Locus Of Control* and Medication Compliance in Type II Patients with DM" which showed that most respondents had a *Health Locus Of Control* in the moderate category with most of the respondents being people with Type II DM who did not have a job as many as 25 respondents (50%).

Compliance with Medication for Pulmonary TB Patients in the Working Area of the Nosarara Health Center

The results of the univariate analysis of medication adherence to pulmonary TB patients in the work area of the Nosarara Health Center were seen from the medication adherence variables of respondents who did not comply with 42 respondents (62.7%) and 25 respondents (37.3%) who complied. These results were obtained based on the questions in the questionnaire given.

Based on the assumption that researchers with pulmonary TB at the Nosarara Health Center are still not compliant with taking medication, this is due to the patient's lack of knowledge about pulmonary TB disease, patients and families do not know the impact that will be caused if they do not take medication, patients sometimes forget to bring medicine when traveling long distances, patients sometimes do not come to take medicine because the location of the health center is far from where the patient lives. Researchersadded that knowledge will be obtained if they have a high level of education, where a low level of education will affect a person's absorption in receiving newly introduced information so that respondents do not comply with taking medication.

According to the theory of the Indonesian Ministry of Health, (2018) patient non-compliance in undergoing therapy is one of the causes of therapy failure. This is often caused by a lack of knowledge and understanding of pulmonary TB disease. The main reason for the failure of treatment of pulmonary TB patients is the patient's non-compliance with regular treatment. One of them causes non-compliance with anti-Tuberculosis drugs. WHO (2020), added that the factors that affect medication adherence are related to resources, attitudes, knowledge, perceptions and expectations of patients. Some of the factors of patients that affect medication adherence include forgetfulness, worry about medication side effects, low motivation, low knowledge, lack of effects from drug use, negative belief in drug progress, lack of supervision, low expectations, frustration with existing health services and feelings of stigmatization towards treatment and illness suffered.

In line with research by Widiyanto, A. (2020) "The Relationship between Medication Compliance and Recovery of BTA Positive Pulmonary Tuberculosis Patients at the Delanggu Health Center, Klaten Regency" obtained results that most respondents did not comply with treatment and most of the respondents had an elementary school education level. This is corroborated in the research of Gopi *et al* , it was found that factors related to non-compliance are education caused by a lack of knowledge about the importance of therapy under supervision.

The Relationship of *Health Locus of Control* with Medication Compliance in Tuberculosis Patients in the Working Area of the Nosarara Health Center

The results of the bivariate analysis table showed that of the respondents who had *a health locus of control* both with medication adherence, namely 18 respondents (26.9%) while those who did not comply were 10 respondents (14.9%) while respondents who had *a health locus of control* lacked with medication adherence to medication 7 respondents (10.4%) while those who did not comply were 32 respondents (47.8%).

Based on statistical analysis using *the Chi square* test, the p-value = 0.000 < 0.05 was obtained. From the results of the *Chi-Square test* obtained, it can be concluded that there is a relationship *between Health Locus of Control* and medication adherence in *Tuberculosis patients* in the Nosarara Health Center Working Area.

The researcher's assumption is that *Health Locus Of Control* has a meaningful relationship with treatment adherence because, according to researchers, pulmonary TB treatment will not reach optimal without the patient's own self-awareness of treatment adherence. With a good *Health Locus Of Control* will increase motivation to recover and seek treatment, while for *a Health Locus Of Control* that is still lacking, it will cause non-compliance with the treatment given.

A theory by Lestari and Chairil in 2020 states that motivation is a response to goals. Pulmonary TB sufferers want a cure for their disease. This is what motivates and encourages patients to obediently take medication and complete treatment programs.

The results of the study also showed that there were respondents who had *a health locus of control* both with adherence to taking medication in the compliant category, namely 18 respondents (26.9%) while those who did not comply were 10 respondents (14.9%).

The results showed that there were respondents who had a good *health locus of control* and had good adherence in treatment as many as 18 respondents (26.9%). The researcher's assumption that *the health locus of control* is not compliant that the respondents have by obediently taking medicine, because the respondents have the belief that they can control their own health.

According to Putri FD et al's research, stating *that health locus of control* is a client's belief that their health status is under their control. Individuals who believe that they have a great deal of influence on their health status are called *internal health locus of control*. Individuals who train internal *control* tend to take more initiatives related to their own health care, know more about their health and are more compliant with health programs. This research is in line with the research conducted by Suci Rahayu, namely there is a relationship between internal *Health Locus of Control* and treatment adherence in *Tuberculosis patients*.

Meanwhile, the respondents in this study who had a *health locus of control level* in the good category but did not comply with Tuberculosis treatment at the Nosarara Health Center were as many as 10 respondents (14.9%).

The researcher's assumption is that this can be caused because in the results of the study it can be seen that *the health locus of control* with the *category of Powerfull Other health locus of control* dominates at 66.85%. *Health Locus of Control* does tend to be non-compliant with taking medication because there is still a lack of concern for the respondents' health and many respondents also depend on medical personnel and nurses, where *the Health Locus of Control* is more or less to the external dimension. Which means that external factors have more role in the desire to get better, in this case, it can be said that supervisors take medicine, doctors and health service medical personnel. In addition, work factors can also cause this, where there are more *Tuberculosis* patients in the Nosarara Health Center work area or do not work, this is because respondents are busy taking care of the house so that respondents are not compliant in taking medication and the respondents' lack of knowledge about the correct use of drugs

The theory states that one of the factors for Tuberculosis medication adherence *is the medication* medication monitoring monitor. A medication intake supervisor (PMO) is someone who voluntarily helps TB patients during the treatment period. PMO is usually a person who is close to the patient and it is better if they live in the same house with the patient. The task of the PMO is to supervise and ensure that the patient takes medication regularly until the treatment period is completed, besides that the PMO also provides support to patients for regular treatment. Supervision from a PMO is a supporting factor for medication adherence because patients often forget to take medication at the beginning of treatment. However, with PMO, patients can take medication regularly so that the treatment program is carried out properly (Kuniyo, 2022).

According to Nuraini, (2020) states that the *locus of external control* is more trusting in events in him that depend on health workers or families. Individuals who have a tendency to have an external *locus of control* will be more passive, have less initiative, seek less information to solve problems and are less willing to try because individuals believe that external factors control themselves, this tendency occurs because of the culture of Indonesian society that depends on each other as well as the experience and dependence of respondents on health workers which causes individuals to have more dominant HLOC types external.

According to Rosela Elmita et al., where a person who does not work has low education, the respondents' knowledge about the correct use of insulin and maintaining a healthy lifestyle is less. This causes respondents to find it difficult to receive messages and suggestions conveyed by health workers and is caused by patients not working, more time spent at home so that respondent information receives less and respondents cannot make good use of health services. Meanwhile, with the work of housewives (IRT) they are more busy taking care of the house so that respondents forget to do insulin therapy that has been recommended by health workers

In line with Sarah Rahmadian. (2021) in a study on *the Relationship between Health Locus of Control* and Medication Compliance of Tuberculosis Patients Participating in Prolanis at the Ketapang Health Center, Probolinggo City. Stating that a person with a condition has more faith in the care of family members, medical professionals as a belief in their health, therefore in this study it was found that the greater the respondent's belief in the role of others in their health, the more compliant the respondent is in carrying out treatment, and vice versa.

The results of the study also showed that there were respondents who had *a health locus of control* in the poor category with a drug compliance rate of 7 respondents (10.4%) while those who did not comply were 32 respondents (47.8%).

According to the researcher, there are respondents who have *a health locus of control* in the low category but still have a level of adherence in taking medication because respondents have high motivation to recover even though awareness of their recovery is still lacking. Thepatient's self-motivation is still not very good, so the patient*'s health locus of control* is still low.

Respondents who have a poor *level of health locus of control* with non-compliant medication adherence to 32 respondents (47.8%). The researcher's assumption that *the health locus of control* is good but obedient in taking medicine, this is influenced by the support of his family to take *Tuberculosis medicine*. In addition, it can be caused by the respondent's lack of knowledge regarding the importance of adherence to therapy and the risks that may occur if non-compliance with medication

According to Ali Z's theory, family support is an attitude, action, and acceptance of the illness towards the sick patient. Support can come from other people (parents, children, husbands, wives or siblings) who are close to the patient. Where the form of support is in the form of information, certain behaviors or material that can make you feel loved, cared for, and loved. According to research by Sisca Damayanti, et al., the family is the closest social environment to the patient so that it is expected to help, control and shape the patient's behavior by complying with therapy regularly.

This research is in line with the research of Wahyuningsih et al, who stated that knowledge is one of the important factors in accessing information, such as knowledge related to treatment related to patient compliance. which the higher the knowledge will make it easier for a person to access information related to treatment.

The results of this study also showed that in respondents who had a *level of health locus of control* in the low category and with a level of compliance with *taking Tuberculosis drugs* that were not compliant, namely 32 respondents (47.8%).

The researcher's assumption that this is due to the lack of knowledge possessed by respondents regarding the importance of adherence in tuberculosis drug therapy and the risks that may occur if non-compliance in carrying out treatment. This can also be due to the lack of socialization about Tuberculosis to the public.

Factors Affecting Medication Compliance According to research conducted by Lestari and Chairil in 2020, patient counseling. Counseling that is always provided by health workers has an effect on medication adherence because the purpose of counseling is to increase patients' willingness and awareness of pulmonary TB treatment. With this, the patient's knowledge will increase about the benefits of taking medication regularly and the risks that occur if the patient does not take medication regularly and does not undergo complete treatment.

This research is in line with the research of Wahyuningsih et al, who stated that knowledge is one of the important factors in accessing information, such as knowledge related to treatment related to patient compliance. which the higher the knowledge will make it easier for a person to access information related to treatment.

CONCLUSION

Tuberculosis patients mostly have *a health locus of control* with a lack of category in the Nosarara Health Center Working area.

Tuberculosis patients mostly have a level of compliance in the non-compliant category in the Nosarara Health Center Working area.

There is a relationship between *Health Locus of Control* and medication adherence to *Tuberculosis patients* in the Nosarara Health Center Working Area

ADVICE

For Widya Nusantara University, it is hoped that it will continue to be able to improve and provide support in the form of facilities and infrastructure such as online reading media regarding the preparation of thesis proposals in the future.

For the Nosarara Health Center, it is hoped that it can provide mental health services for Tuberculosis patients, so that patients can better maintain their lifestyle and increase adherence to taking medication.

For the next researcher, it is hoped that the next researcher can improve the quality of writing and the type of research to the experimental level such as research with treatments for *Tuberculosis* patients and develop variables related to *Tuberculosis problems* such as the length of suffering and the role of drug overseers.

For Patient Health, it is expected that patients will be able to maintain both physical and mental health in order to obtain a better health status.

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