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RELATIONSHIP BETWEEN KNOWLEDGE AND ATTITUDE WITH TUBERCULOSIS PREVENTION EFFORTS IN PRECLINICAL STUDENTS

Romauli Lumbantobing[1]*, Lamtiur Oktavia[2], Mulyadi Djojosaputro[1]
[1]Department of Pharmacology and Therapy, Faculty of Medicine, Universitas Kristen Indonesia, Jl. Mayor Jendral Sutoyo No.2, Cawang, Jakarta Timur, Jakarta 13630, Indonesia
[3]Undergraduate Program, Faculty of Medicine, Universitas Kristen Indonesia, Jl. Mayor Jendral Sutoyo No.2, Cawang, Jakarta Timur, Jakarta 13630, Indonesia
*romauli.lumbantobing@uki.ac.id

ABSTRACT
Tuberculosis (TB) is an infectious disease that can be transmitted, caused by the bacteria Mycobacterium tuberculosis. It is still one of the health problems for national and global communities. This disease can cause disability and even death for sufferers, so it becomes a focus in the goals of sustainable health development. Objective to analyze the relationship between knowledge and attitudes with tuberculosis prevention efforts in preclinical students of the 2022 intake at the Faculty of Medicine, Indonesian Christian University. Method: This study used analytical research with a cross-sectional approach. The number of samples used was 115 respondents, which were taken using the total sampling technique. Based on the research results, 95.6% of preclinical students of the 2022 batch at the UKI Medical Faculty have good knowledge about tuberculosis and 89.6% of students have good attitudes towards efforts to prevent tuberculosis. In the results of the bivariate analysis using the chi-square test, the relationship between knowledge and efforts to prevent tuberculosis was obtained with a p-value of 0.000 (<0.05). In the analysis of the relationship between attitudes and efforts to prevent tuberculosis, a p-value of 0.009 (<0.05) was obtained. From the results of the chi-square test, there was a significant relationship between knowledge and attitudes with efforts to prevent tuberculosis in preclinical students of the 2022 batch at the Faculty of Medicine, Indonesian Christian University. Conclusion: Good knowledge allows students to understand how TB is transmitted, its symptoms, and control strategies. Meanwhile, a positive attitude will form motivation and concern to actively participate in prevention. Therefore, improving these two aspects is an important key in strengthening TB prevention measures among preclinical students.

Keywords: attitude; knowledge; prevention efforts; tuberculosis

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INTRODUCTION

Tuberculosis (TB) is an infectious disease that can be transmitted, caused by the bacteria Mycobacterium tuberculosis. This bacterium was first discovered by Robert Koch in 1882. According to Miller, this bacterium is rod-shaped and has acid-resistant properties, so it is known as Acid-Fast Rod (AFB). In tissue, Mycobacterium tuberculosis is seen as a rod-shaped microorganism with a length varying between 1-4 microns and a diameter of 0.3-0.6 microns. Tuberculosis generally attacks the lungs (pulmonary TB) but can also attack other organs such as bones, brain, digestive tract, kidneys, and others (extrapulmonary TB). Transmission of pulmonary TB mainly comes from patients with AFB-positive sputum and spreads through the air in the form of droplet nuclei (Puspasari & Fina, 2019; Wardanengsih, 2019).

Tuberculosis is still one of the health problems for national and global communities. this disease can cause disability and even death for sufferers, so it becomes a focus in the sustainable health development goals (SDGs). According to Wigiyanti & Faradisi (2023) tuberculosis is a disease that attacks the lungs, so the impact on people with TB is

shortness of breath (Aja et al., 2022; Wigiyanti & Faradisi, 2023). According to the World Health Organization (WHO) report, tuberculosis is one of the diseases that causes death due to infectious diseases. As many as 1.3 million cases of death due to TB. Globally, TB is the second highest cause of death after COVID-19. In 2022, there were 10.6 million cases of TB worldwide. This number is the highest number in one year since WHO began monitoring TB globally. Tuberculosis can affect anyone, regardless of age and gender. However, TB cases are more common in adult males (aged ≥15 years) with an estimated 5.8 million cases, compared to adult females (aged ≥15 years) who recorded 3.5 million cases and 1.3 million cases in children (aged 0-14 years). According to the Global Tuberculosis Report 2023, Indonesia ranks second as the country with the most tuberculosis cases in the world, Indonesia contributes 10% of the total global cases. It is estimated that there are 1,060,000 TB sufferers in Indonesia with an incidence rate of 385 per 100,000 population. This figure is much higher than the number of TB cases before the COVID-19 pandemic, which averaged less than 600,000 per year. Tuberculosis is declared as an emerging disease, because the incidence rate has continued to increase every year since 2000 (Organization, 2020).

The prevalence of Pulmonary TB in DKI Jakarta Province is still high so that it must receive serious attention to its handling efforts. Based on data from the Central Statistics Agency (BPS) of DKI Jakarta Province in 2021, regarding the number of cases of the disease in the DKI Jakarta area, there was an increase in the number of Pulmonary TB cases by 21.2% from 2020. In 2021, the number of Pulmonary TB cases in DKI Jakarta was recorded at 26,854 cases, with the number of Pulmonary TB cases in the Seribu Islands being 37 cases, South Jakarta 4,812 cases, East Jakarta 8,222 cases, Central Jakarta 5,008 cases, West Jakarta 4,956 cases, and North Jakarta 3,819 cases (Timur, 2025). The increase in the incidence of TB in Indonesia is influenced by various factors, one of which is the lack of public knowledge about preventing the transmission of tuberculosis. Knowledge itself is the result of human sensing of an object through the five senses such as the eyes, nose, ears, and others. The better a person's knowledge, the better the attitude shown in efforts to prevent the transmission of tuberculosis. This is due to the influence of knowledge on attitudes and behavior in prevention efforts. Thus, knowledge becomes an important aspect in shaping a person's actions, because good knowledge can create good behavior (Febriyanti, 2020; Notoatmodjo, 2003; Putri et al., 2022). In previous research conducted by Maulana R, et al., the chi square test results were obtained $p = 0.010$ ($p < 0.05$) which showed that there was a significant relationship between knowledge and tuberculosis prevention efforts (Maula et al., 2021) In another study conducted by Ekastuti NWA using the Spearman Rho Test, a p value of 0.041 was obtained, indicating a significant relationship between knowledge and tuberculosis prevention behavior. The correlation coefficient value was obtained at 0.614, indicating that the higher the level of respondent knowledge about tuberculosis, the better their behavior in carrying out prevention efforts.

Another factor that can contribute to the increasing incidence of TB is a poor attitude in preventing the transmission of TB. Attitude is a person's response or tendency to think, feel, and act towards a particular object, idea, or situation. A person's attitude is influenced by various things, such as personal experience, influence from other people, culture, mass media, educational institutions, and emotional aspects. Based on research conducted by Kaka MP, et al., the process of attitude formation is influenced by the presence of stimuli, such as knowledge about preventing the transmission of pulmonary TB. Stimuli trigger individuals to respond, which can be in the form of good or bad attitudes and then manifested in behavior. Good attitudes can contribute to reducing the

incidence of TB transmission (Kaka, 2021). Efforts to prevent TB transmission can be done in various ways, such as living a healthy lifestyle by consuming nutritious food, getting enough rest, exercising regularly, avoiding cigarettes, alcohol and stress. In addition, it is important to cover your mouth when coughing, not spitting carelessly, and implementing the DOTS (Directly Observed Treatment, Shortcourse) strategy. Prevention of pulmonary TB transmission can also be done through an approach to patients and their families, such as providing education about pulmonary TB which includes the definition, causes, symptoms, and management and distributing leaflets when patients come for treatment. This counseling and leaflet distribution are useful for preventing the spread of pulmonary TB, as well as improving family behavior in efforts to prevent the disease.

Knowledge and attitudes in preventing tuberculosis are important factors in efforts to prevent the transmission of TB, which must be supported by good knowledge and the right attitude. To improve compliance and prevent the transmission of tuberculosis, a good understanding of this disease is needed. Students are part of an educated community group who are expected to have a good and correct understanding of tuberculosis, especially for medical students. From the explanations above, the author chose to research the relationship between knowledge and attitudes with efforts to prevent tuberculosis in preclinical students of the 2022 class at the Faculty of Medicine, Christian University of Indonesia. The general objective of this study was to analyze the relationship between knowledge and attitudes with tuberculosis prevention efforts in preclinical students of the 2022 intake at the Faculty of Medicine, Christian University of Indonesia.

METHOD

Research Design

The type of research used in this research is analytical with a cross-sectional approach. In this way, all variables in this research will be observed and measured at the same time. This research is the aim of finding out the relationship between knowledge and attitude and efforts to prevent the loss of pre-clinic students class of 2022 at the Faculty of Medicine of Indonesia's Christian University

Research Location and Time

This research was carried out at the University of Medicine's Faculty of Medicine Indonesian Christians, in May-June 2024.

Population and Sample

The population in this study was 162 preclinical students from the 2022 intake. The sample was taken using the Slovin formula and a total of 115 samples were obtained who met the inclusion and exclusion criteria.

Inclusion and Exclusion Criteria

Inclusion Criteria: Preclinical students class of 2022 at the Faculty of Medicine, Indonesian Christian University

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Exclusion Criteria: Preclinical students class of 2022 who are sick and did not fill out the questionnaire form properly.

Data Collection Techniques

Data were collected by distributing questionnaires online through a digital platform (Google Form), taking into account ease of access and time efficiency. Data collection was carried out during a certain period determined by the researcher.

Data Analysis Method

Univariate analysis is data analysis related to the measurement of one variable at a certain time. The purpose of univariate analysis is to describe the characteristics of dependent and independent variables by observing the frequency distribution and percentage of each variable. Bivariate analysis aims to test the relationship between dependent and independent variables. The chi square test is used as a statistical test. The relationship tested is the relationship between knowledge and attitudes with efforts to prevent tuberculosis. The results of the chi square test show a p-value <0.05, so it is concluded that there is a statistically significant relationship between the dependent and independent variables.

RESULT

Table 1 shows data that respondents who are 20 years old have the largest percentage, which is 49.6%. Based on gender, female respondents have a much larger percentage than male respondents, with a total of 80 people (69.6%).

Table 1.
Frequency Distribution of Respondent Based on Age and Gender

Characteristic	f	%
Age		
19 year	43	37.4
20 year	57	49.6
21 year	15	13.0
Gender		
Male	35	30.4
Female	80	69.6

Distributions of frequency categories respondent's research revealed that as much as 95.6% of respondents are in the good knowledge category, 3.5% of respondents are in the. The adequate category and 0.9% response rate are in the insufficient category, meanwhile, for the attitude category, there were 89.6% of respondents who had a good attitude against the disease that has been diagnosed and as much as 10.4% of respondents have a lack of attitude towards tuberculosis disease; furthermore, for the category of prevention efforts, there were as many as 93.0% of respondents who had efforts good prevention against tuberculosis disease and only 7.0%. Respondents have fewer prevention efforts against the disease tuberculosis, as described in the data in Table 2 below:

Table 2.
Frequency Distribution of Respondents Based on Knowledge, Attitude and Prevention Effort Categories

Categories	f	%
Knowledge		
Not Good	1	0.9
Enough	4	3.5
Good	110	95.6
Attitude		
Not Good	12	10.4
Good	103	89.6
Prevention Effort		
Not Good	8	7.0
Good	107	93.0

Table 3 shows the relationship between knowledge and efforts to prevent tuberculosis in pre-clinic students in 2022 at FK UKI. The results show that 105 respondents had Good knowledge about tuberculosis also has benefits for good prevention. A total of 5 respondents had good knowledge about tuberculosis, but had limited prevention efforts not enough. Meanwhile, 1 respondent had less knowledge about tuberculosis but had good prevention efforts. The results of statistical tests using chi-square are obtained values p-value is 0.000, which means there is a significant relationship betweenEducation by trying to prevent student behavior pre-clinic class of 2022 at FK UKI.

Table 3.
Relationship Between Knowledge and Prevention Efforts Respondent

Respondents' Knowledge About Tuberculosis	Tuberculosis Prevention Efforts			p-value
	Not Good	Good	Total	
Not Good	0	1	1	0.000
Enough	3	1	4	
Good	5	105	110	

Based on table 4 of the relationship between attitude and effort prevention of income among pre-clinic students class of 2022 at FK UKI shows the results that 98 respondents have a good attitude. Also, apply good income prevention efforts. A total of 5. The respondent has a good attitude, but his defense efforts are lacking. Meanwhile, 9 respondents with an attitude of not having enough money for good income prevention and 3 respondents with a less positive attitude have fewer prevention efforts. The results of statistical tests using the Chi-Square method show the p-value as large as 0.009, which means there is a significant relationship between attitude with efforts to prevent the loss of money in the pre-clinic students' class of 2022 at FK UKI.

Table 4.
Relationship Between Attitude and Prevention Efforts Respondent

Respondents' Attitude About Tuberculosis	Tuberculosis Prevention Efforts			p-value
	Not Good	Good	Total	
Not Good	3	9	12	0.009
Good	5	98	103	

DISCUSSION

Level of Tuberculosis Knowledge. Based on the results of research conducted on students' pre-clinic class of 2022 at FK UKI, it is known that the majority of respondents have a good level of knowledge about the disease that has occurred, namely a total of 110 respondents with a percentage of 95.6%. This research is in line with research carried out by Fikri M et al, who found that out of 48 responses, there were 26 (54.2%) had good knowledge about pulmonary TB disease (Fikri et al., 2024). A study conducted by Isranugraha A at the Kalumata Community Health Center, city Ternate, showed that 196 respondents (51.3%) had a level of good knowledge (Isranugraha & Nur, 2021). According to Notoatmodjo, knowledge is a result of the process of understanding that occurs after someone does it sensing of an object. Several factors influence knowledge, namely internal factors such as education and age, as well as external factors such as environmental and social, and cultural factors.

Results of research conducted on pre-clinic students in 2022 at FK U$KI, there were 103 respondents (89.6%) who had a good attitude towards the prevention of loss of money. This research is in line with research carried out by Nurliani at the city's main public school, Banjarmasin, where there were 25 responses (78.1%) in the good attitude category (Nurliani et al., 2024). In research carried out by Khairunnisa also found some the vast majority of respondents to this research have a good attitude towards the prevention of pulmonary TB, that is, as many as 22 respondents (73.3%) (Saragih et al., 2023). Attitude is a person's response to an object influenced by various factors, such as personal experience, culture, other

people who are considered important, religion, and emotions. Attitude consists of three the first components, namely cognitive (knowledge about an object), affective (happy, hateful, sad), and emotional or conative (desire to act).The results of statistical tests using the chi-square method are as large as 0.000 ($p<0.05$), so it can be concluded that there is a significant relationship difference between knowledge about tuberculous therapy and effort prevention of tuberculosis in pre-clinic students class of 2022 at FK UKI. This research shows that the better the knowledge, the better the prevention efforts. In general, knowledge is obtained through human sensing of an object through the five senses, such as the eyes, nose, ears, and others. Thus, Better insight will result in preventative action, which is more optimal.

This research is in line with the study conducted by Maulana R on public health students at the Faculty of Health Sciences, UMS, which showed a p-value of 0.010 ($p<0.05$). Thus, it can be concluded that there is a significant relationship between knowledge and tuberculosis prevention efforts. The study conducted by Silalahi MK also showed statistical test results with a p-value of <0.000 ($p<0.05$), indicating a relationship between knowledge and preventive behavior toward the transmission of pulmonary tuberculosis in the pulmonary clinic. The statistical analysis showed an odds ratio (OR) value of 1.619, meaning that respondents with lower knowledge had a 1.6 times greater chance of exhibiting poor behavior in preventing the transmission of pulmonary TB compared to respondents with good knowledge. This indicates that knowledge plays an important role in shaping a person's actions (Mujahidah et al., 2023). Research suggests that there is a relationship between levels of knowledge and efforts to prevent debt loss in the students' pre-clinic class of 2022 at FK UKI. The better the level of knowledge, the better the students' efforts in preventing the loss of money. This matter is in line with the research results, where out of 110 respondents well-informed only 5 respondents who have taken preventive measures against tuberculosis are less.

The results of the statistical test showed a p-value of 0.009 ($p < 0.05$), indicating a significant relationship between attitude and tuberculosis prevention efforts among pre-clinical students of the 2022 cohort at the Faculty of Medicine, UKI. A positive attitude in this study was influenced by the respondents' level of knowledge. The research results show that the higher a person's knowledge, the better their attitude toward tuberculosis prevention efforts. Knowledge is one of the important factors influencing attitude. Based on experience and research, an attitude that is based on knowledge tends to last longer compared to an attitude not based on knowledge. However, it is important to note that someone with limited knowledge does not always demonstrate a poor attitude, as attitude is also influenced by other factors such as experience, beliefs, and motivation.This study is in line with research conducted by Rahman F et al., which showed the results of a chi-square test with a p-value of 0.000, indicating a significant relationship between attitude and tuberculosis prevention efforts in the community (Rahman et al., 2017).Research conducted by Khairunnisa et al. also explained that the correlation coefficient value between attitude and pulmonary tuberculosis prevention efforts was 0.45, indicating a moderate relationship between the independent variable (attitude) and the dependent variable (prevention efforts).

Research by Safaruddin and Aris M showed the results of a chi-square test with a p-value of 0.002, meaning there was a relationship between attitude and pulmonary TB prevention in the working area of the Palakka Community Health Center, Barru Regency. This relationship was influenced by patients' knowledge of their condition; the broader a person's knowledge, the better the attitude they demonstrate (Aris, 2023). A positive attitude is influenced by a person's education and knowledge. Attitude reflects a person's ability to accept, believe in, value, and take responsibility in their actions. A person's response to certain behaviors shows

their attitude, so it can be concluded that a good attitude toward tuberculosis prevention will form when there is also good knowledge about tuberculosis.The researchers believe that there is a relationship between attitude and tuberculosis prevention efforts among pre-clinical students of the 2022 cohort at the Faculty of Medicine, UKI. The better the students' attitudes, the better their efforts in preventing tuberculosis. This study shows that of the 103 respondents who had a good attitude, only 5 respondents had poor tuberculosis prevention efforts.

CONCLUSION

Tuberculosis is still a major health problem in Indonesia, including in higher education institutions. Preclinical students as a potential group in the TB prevention chain have a strategic role in supporting the success of the national TB control program. Good knowledge and attitudes have been proven to significantly influence prevention efforts, both at the individual and community levels. Good knowledge allows students to understand how TB is transmitted, its symptoms, and control strategies. Meanwhile, a positive attitude will shape motivation and concern to actively participate in prevention. Therefore, improving these two aspects is an important key in strengthening TB prevention measures among preclinical students.

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