

## Conference Paper

# Tuberculosis (TB)-Preventive Behavior and Its Determinants among Students Boarded in Islamic Boarding Schools (Pesantren) in Garut, West Java, Indonesia

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## Abstract

Tuberculosis (TB) poses a specific threat to certain communities, such as Islamic boarding schools "(Pesantren)". These Islamic boarding students, called "santri", are vulnerable to contracting TB because their schools are overcrowded and have poor ventilation. A cross-sectional study was conducted using six Islamic boarding schools in Garut, West Java, to assess the determinants of TB-preventive behavior among boarding students. Using two-stage cluster sampling, 500 students were selected to be interviewed using a pretested questionnaire. Associations between gender, education level, knowledge about TB, attitudes towards TB, and TB-preventive behavior were analyzed using a chi-squared test. A total of 58.4% students practice a limited amount of TB-preventive behavior. A significant percentage of students (54.6%) have a good amount of knowledge about TB, and 57.6% of students have a negative attitude towards TB. A total of 51.4% students are male, and 89.8% of students have a low education level. There are statistically significant associations between gender and TB-preventive behavior ( $p = 0.000$ ), as well as between education level and TB-preventive behavior ( $p = 0.012$ ). Female students practice TB-preventive behavior approximately twice as much as male students, and students who are highly educated practice TB-preventive behavior approximately twice as much as those with limited education.

**Keywords:** Tuberculosis, TB-Preventive Behavior, Boarded Students, Islamic Boarding Schools, Pesantren

## 1. INTRODUCTION

A total of 9.6 million cases of tuberculosis (TB) were recorded around the world in 2014. Of these cases, 58% occurred in Southeast Asia and the Western Pacific. Indonesia has

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Received: 21 January 2018

Accepted: 8 April 2018

Published: 17 May 2018

Publishing services provided by  
Knowledge E

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Selection and Peer-review under the responsibility of the 2nd International Meeting of Public Health 2016 Conference Committee.

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the second highest number of TB cases worldwide, 10% fewer than India. Tuberculosis is one of the five leading causes of death in women aged 20-59 years old around the world. Approximately 480,000 women and 890,000 men died from TB, some of whom were HIV-positive. In 2014, approximately one million children were infected with and died because of TB around the world [11].

According to *Indonesia Basic Health Research 2013*, pulmonary tuberculosis affects 0.4% of the population. The highest prevalence, 0.7%, is seen in West Java. Papua and Jakarta each have a prevalence of 0.6%. The prevalence of pulmonary tuberculosis is higher among men (0.4%) than among women (0.3%). The prevalence of pulmonary tuberculosis tends to be higher among people with low education levels, with a prevalence of 0.5% among people not going to school and 0.2% among those with a diploma (D1-D3)/university graduates (National Institute for Health Research and Development Ministry of Health Republic of Indonesia 2013).

Tuberculosis poses a specific threat to certain communities, such as pondok pesantren (Islamic boarding schools). The dense occupancy of these boarding schools leads to TB vulnerability. Research results show that the density of occupancy, room temperature, room humidity, type of flooring, disposing of phlegm carelessly, and coughing/sneezing without covering the mouth affect pulmonary tuberculosis incidence [12]. People who have contact with TB patients in their households are at a four-fold greater risk of being infected with TB as compared to those with no such contact [9].

Diseases in Islamic boarding schools can be caused by student behavior, such as taking turns using the same tableware and clothing. These behaviors are intended to express a sense of brotherhood, solidarity, and togetherness within the boarding school [5]. Student gender, education, attitudes, and exposure to information can affect students' likelihood of engaging in clean and healthy living behaviors [3].

In 2014, the number of newly detected TB cases in Garut District amounted to 1,669, as compared to 2,600 cases in 2013. In Garut District, the case detection rate (CDR), or BTA+ coverage, at 64.2%, is still below the national target of 70%. The case notification rate (CNR), or the average number of patients diagnosed in Garut District (100.56), is below the average number of cases identified in the West Java Province (150.20) [10]. Based on these findings, research was conducted to identify TB-preventive behavior in Islamic boarding schools in Garut, along with its determinants, including gender, education, knowledge about TB, and attitudes towards TB.

## 2. METHODS

The research was conducted using quantitative research methods and a cross-sectional design. It was conducted in February of 2016 in all six Islamic boarding schools in the Limbangan Sub-District of Garut District. The population of the research included all students in these six Islamic boarding schools. Five hundred samples were obtained and analyzed. The data were collected through interviews utilizing a questionnaire that had been tested and analyzed using chi-squared analysis.

## 3. RESULTS

The results of this research show that in terms of the entire sample, there are more male students (51.4%), students with low education levels (89.8%), students with high levels of TB knowledge (54.6%), students with negative attitudes towards TB (57.6%), and students with poor TB-prevention behavior (58.4%).

TABLE 1: The Distribution of Students based on TB-Preventive Behaviors and their Determinants in Islamic Boarding Schools in Garut in 2016.

Independent variables	n	%
TB-Preventive Behavior		
Bad	292	58.4
Good	208	41.6
Gender		
Male	257	51.4
Female	243	48.6
Education Level		
Low	449	89.8
High	51	10.2
Knowledge about TB		
Low	227	45.4
High	273	54.6
Attitude		
Negative	288	57.6
Positive	212	42.4

The analysis results (Table 2) show no significant correlation between gender ( $p < 0.005$ ) or educational level ( $p < 0.012$ ) and TB-preventive behavior. Female students engage in TB-preventive behavior approximately twice as often as male students (OR = 2.02, 95% CI = 1.4 to 3.0). Students with high education levels engage in TB-preventive

behavior approximately twice as often as those with low educational levels (OR = 2.2, 95% CI = 1.2 to 4.0).

## 4. DISCUSSION

According to the results of this study, student gender influences TB-preventive behavior, with female students tending to have better TB-prevention behavior. This result is consistent with TB occurrence around the world. The prevalence of tuberculosis among men is nearly double that among women [11]. One reason for this is because the prevalence among male smokers is much higher than that among female smoker, with smoking being a TB risk factor [6]. Comparable results were found in research conducted in Wori, North Sulawesi, which indicated that men had a six-fold higher risk of suffering from pulmonary tuberculosis as compared to women [2]. Research in Nigeria shows a relationship between gender and cases of BTA+ [4]. Another reason women have a lower risk of suffering from pulmonary tuberculosis is Indonesian cultural values. In Indonesia, house-cleaning chores are assigned to women. From childhood, daughters are accustomed to helping their mother clean the house, including cleaning and tidying up their own rooms. These cleaning habits continue during their time living in boarding schools, which prevents them from becoming infected with TB. In 2011, research in the Nurul Huda Islamic Boarding School, in Sukabumi, showed that female students tend to practice clean and healthy living more often than male students [3]. Based on this information, a gender-based intervention in which male students are taught about personal hygiene is required.

There is a relationship between level of education and TB-preventive behaviors. Students with high levels of education practiced better TB-preventive behaviors as compared to their counterparts with low education levels. Comparable results were discovered in research conducted in the Puskesmas (community health center) of Baja Kota, Tangerang, proving that there is a connection between education level and behaviors intended to prevent TB infection ( $p = 0.031$ ) [8]. Research in Kenya showed that TB-preventive behavior can be influenced by improvements in one's level of education [13]. Those with better educational backgrounds have had more exposure to TB knowledge and can glean the correct information from appropriate sources [13]. Provisions for education-based training that utilizes effective methods and media are required. This will allow information to be more easily disseminated, positively affecting students' health behaviors, especially regarding the prevention of TB. In addition, in Islamic boarding schools, the TB-prevention curriculum should be

TABLE 2: The Relationships between Gender, Education Level, Knowledge, and Attitudes towards TB and TB-Preventive Behavior of Islamic Boarding School Students in Garut in 2016.

Variables	TB-Preventive Behavior				OR	p value
	Bad		Good			
	n	%	n	%		
Gender						
Male	176	68.5	81	31.5	2.018	0.000
Female	126	51.9	117	48.1	(1.402-2.904)	
Education Level						
Low	280	62.4	22	43.1	2.184	0.012
High	22	43.1	27	56.9	(1.215-3.925)	
Knowledge about TB						
Low	139	61.2	110	40.3	1.006	0.798
High	163	59.7	110	40.3	(0.74-1.528)	
Attitudes towards TB						
Negative	177	61.5	111	38.5	110	0.637
Positive	125	59.0	109	41.0	(0.773-1.594)	

integrated with other types of health education because Islamic religious teachings include cleanliness as a matter of faith.

The results of this study prove that there is no association between student knowledge about TB and TB-preventive behavior. This study found only around 50% of the students have a high level of knowledge about TB. Approximately half of them (54.6%) know the causes and symptoms of TB, but many students do not know about the modes of TB infection and prevention. Given these results, one can see that even they know what is TB they still don't have good knowledge how to prevent it. Thus, explain why they don't do TB prevention behavior well.

This study proved that, in Garut District, Islamic boarding students' attitude towards TB is not related to their behavior in the prevention of TB. This may be because the students' attitude towards TB has not reached the stage of internalization [1]. Since some students still have lack knowledge about modes of infection and prevention of TB, although they have negative attitude towards TB they couldn't perform the prevention behavior of TB appropriately.

## 5. CONCLUSION

More than half of students in Islamic boarding schools in Garut District have poor TB-preventive behavior. These students tend to be male, have low education levels, have

high levels of knowledge about TB, and have negative attitudes towards TB. Gender and level of education have relationships with TB-preventive behavior. Female students practice TB-preventive behavior approximately twice as often as male students, and highly educated students are twice as likely to engage in TB-preventive behavior as compared to those with low education levels. Gender-based interventions are necessary to improve the methods and media used to teach TB-prevention behavior. In addition, the Islamic boarding school TB curriculum must be integrated with health education generally.

## ACKNOWLEDGMENTS

This research was supported by a grant from the Indexed International Publications for Student Final Grant (PITTA), Universitas Indonesia, with PITTA contract number 1971/UN2.R12/HKP.05.00/2016. The researchers would like to express their gratitude for this support, which motivated them to conduct this research.

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