



# INTERNASIONAL CONFERENCE ON MULTIDISCIPLINARY APPROACHES IN HEALTH SCIENCE

VOLUME 2 , ISSN 3032-4408 (Online)

<https://ejournal.poltekkes-denpasar.ac.id/index.php/icmahs>

---

## Sanitation Conditions of Patient Rooms and Their Relationship to Pulmonary TB Incidents in Denpasar City

I Wayan Sudiadnyana<sup>\*</sup>, Putu Fira Oktavia Dewi, Ni Putu Maharani WP, I Made

Bulda Mahayana, I Wayan Jama,

Environmental Health Poltekkes Kemenkes Denpasar

Email: [sudiadnyana67@gmail.com](mailto:sudiadnyana67@gmail.com)

### Article history

Posted : 2024-12-12

Reviewed : 2024-10-29

Received : 2023-10-03

### ABSTRACT

Pulmonary TB is an infectious disease caused by infection with the bacteria *Mycobacterium tuberculosis*. Indonesia ranks second with the highest number of TB cases in the world. The factors for the transmission of pulmonary TB disease are very diverse, one of which is the condition of room sanitation. The purpose of this study was to determine the condition of room sanitation of TB patients and its relationship with the incidence of pulmonary TB in Denpasar City. The study used a retrospective observational design with a case-control design. Sampling using purposive sampling was 34 cases and 34 controls in the Working Area of UPTD Puskesmas III South Denpasar, as the area with the most cases of Pulmonary TB in Denpasar City. Data were collected using observation sheets and analyzed using the chi-square statistical test. The results of data analysis showed that the sanitation conditions of the rooms of pulmonary TB patients did not meet the requirements, according to the lighting parameters: 61.76%, temperature: 64.71%, humidity: 73.53%, ventilation: 55.88% and occupancy density: 55.88%. The results of statistical tests showed a relationship between lighting and the incidence of pulmonary TB ( $p = 0.003$  CC = 0.335 OR = 4.487), temperature ( $p = 0.000$  CC = 0.431 OR = 8.556), humidity ( $p = 0.014$  CC = 0.299 OR = 3.519), and ventilation ( $p = 0.006$  CC = 0.314 OR = 4.117). Occupant density was not related to the incidence of pulmonary TB ( $p = 0.145$ ). The public is advised to pay attention to the fulfillment of bedroom sanitation requirements and the Health Center is expected to always provide education related to room sanitation to prevent transmission of pulmonary TB.

**Keywords:** Room Sanitation, pulmonary TB.



# INTERNASIONAL CONFERENCE ON MULTIDISCIPLINARY APPROACHES IN HEALTH SCIENCE

VOLUME 2 , ISSN 3032-4408 (Online)

<https://ejournal.poltekkes-denpasar.ac.id/index.php/icmahs>

## Introduction

Tuberculosis (TB) is an infectious disease that is still a health threat in Indonesia and the world. Although the Directly Observed Treatment Shortcourse (DOTS) strategy has been implemented since 1995, TB continues to spread widely, especially through acid-resistant *Mycobacterium tuberculosis* bacteria. This disease can cause serious complications and death if not treated properly. TB most often attacks the lungs, known as Pulmonary TB. TB can also spread and attack other organs such as the lymph nodes, spine, and brain<sup>1</sup>. Every year, millions of people are infected with Pulmonary TB, making Pulmonary TB a global health problem. The transmission and development of Pulmonary TB are influenced by various factors, but the physical sanitation of the room is very important. Rooms that do not meet health standards increase the risk of disease transmission, including Pulmonary TB. *Mycobacterium tuberculosis* bacteria can survive from several hours to weeks, depending on exposure to sunlight, ventilation, humidity, non-waterproof floors, and occupant density. Good ventilation and direct sunlight can reduce the concentration of bacteria and the risk of transmission. *Mycobacterium tuberculosis* bacteria can spread more quickly in humid, dark and low-light environments<sup>2</sup>

Based on the WHO's Global Tuberculosis Report 2022, tuberculosis was one of the 10 leading causes of death in

2019. TB cases increased by around 600,000 in 2021 to 10.6 million cases. This disease is transmitted to all individuals regardless of age or gender, with 6 million cases in adult men, 3.4 million in adult women, and 1.2 million in children. Indonesia ranks second after India with the highest number of TB cases in the world, followed by China. Data from the Indonesian Ministry of Health shows an estimated 969,000 TB cases with 93,000 deaths per year, especially in the productive age group of 45-54 years. Globally, TB cases are highest in the productive age group of 25-34 years<sup>3</sup>. In Bali, the number of TB cases. Lung in 2022 reached 3,042, with Denpasar as the city with the highest cases. Disease data from UPTD Puskesmas III South Denpasar during 2023 recorded 52 cases of pulmonary TB. The health center has been monitoring patients and educating the importance of PMO. On the other hand, the health center has never conducted a sanitation inspection of the homes of patients with pulmonary TB. Various previous studies have shown that there is a significant relationship between the physical quality of the house and the incidence of pulmonary TB. and there has been no study that specifically analyzes the relationship between room sanitation and the incidence of pulmonary TB sufferers..

## Research Method

The study used a retrospective observational design with a case-control design. This design allows researchers to look back in the course of the disease, analyzing the time



# INTERNASIONAL CONFERENCE ON MULTIDISCIPLINARY APPROACHES IN HEALTH SCIENCE

VOLUME 2 , ISSN 3032-4408 (Online)

<https://ejournal.poltekkes-denpasar.ac.id/index.php/icmahs>

sequence between the case group and the control group as a comparison. Sampling was done by purposive sampling on 34 cases and 34 controls in the Working Area of UPTD Puskesmas III South Denpasar as the area with the most cases of Pulmonary TB in Denpasar City. The types of data collected in this study were primary and secondary data. Primary data were obtained through observation, interviews, and the results of room sanitation measurements. Secondary data were the condition of patients with pulmonary TB disease obtained from the Denpasar City Health Office and confirmed at Puskesmas III South Denpasar. The technique of

collecting room sanitation data was obtained through observation, interviews, and also measuring physical parameters. Room sanitation measurements were carried out using a Lux Meter to measure lighting, a Thermohygro Meter to measure temperature and humidity, and a meter to measure ventilation area. The data was further processed using univariate and bivariate analysis of the Chi-square test to determine the relationship between patient room sanitation (lighting, temperature, humidity, ventilation and occupancy density) with the incidence of pulmonary TB.

## Results and Discussions

Table 1. Relationship between Room Lighting and the Incidence of pulmonary TB. in Denpasar City

	Incidence of Pulmonary TB				Total		P Value
Lighting	Casus		Control				
	N	%	N	%	N	%	
Not meets requirements	21	30,9	9	13,2	30	44,1	0,003
Meets requirements	13	19,1	25	19,0	38	38,0	
Total	34	50	34	50	68	100	

From the results of the statistical test, there is a relationship between Room Lighting and the Incidence of *pulmonary* TB. The calculation of the Coefficient Contingency (CC) obtained a low relationship between natural lighting and the incidence of Pulmonary TB with a CC value of 0.335 while based on the calculation of the Odds Ratio (OR) the result was 4.487 which means that respondents with bedroom lighting that does not meet the requirements have a 4.487 times greater risk of contracting Pulmonary TB.



# INTERNASIONAL CONFERENCE ON MULTIDISCIPLINARY APPROACHES IN HEALTH SCIENCE

VOLUME 2 , ISSN 3032-4408 (Online)

<https://ejournal.poltekkes-denpasar.ac.id/index.php/icmahs>

Table 2. Relationship between Room Temperature and the Incidence of Pulmonary TB in Denpasar City

Temperature	Incidence of Pulmonary TB				Total	P Value	
	Kasus		Kontrol				
	N	%	N	%	N	%	
Not meets requirements	22	32,4	6	8,8	28	41,2	0,000
Meets requirements	12	17,6	28	41,2	40	58,8	
Total	34	50	34	50	68	100	

From the results of the statistical test, there is a relationship between Room Temperature and the Incidence of Pulmonary TB . The calculation of the Coefficient Contingency (CC) and obtained a moderate relationship between bedroom temperature and the incidence of Pulmonary TB with a CC value of 0.431 while based on the calculation of the Odds Ratio the result was 8.559 which means that respondents with bedroom temperature that does not meet the requirements have a 8.556 times greater risk of contracting Pulmonary TB.

Table 3. Relationship between Room Humidity and Pulmonary TB Incidence in Denpasar City

Humidity	Incidence of Pulmonary TB						P Value
	Casus		Control		Total		
	N	%	N	%	N	%	
Not meets requirements	25	36,8	15	22,1	40	58,8	0,014
Meets requirements	9	13,2	19	27,9	28	41,2	
Total	34	50	34	50	68	100	

From the results of the statistical test, there is a relationship between Room Humidity and Pulmonary TB Incidence. The calculation of the Contingency Coefficient (CC) and the results obtained a low relationship between bedroom humidity and the incidence of Pulmonary TB with a CC value of 0.299 while based on the Odds Ratio calculation the results were 3.519 which means that respondents with



# INTERNASIONAL CONFERENCE ON MULTIDISCIPLINARY APPROACHES IN HEALTH SCIENCE

VOLUME 2 , ISSN 3032-4408 (Online)

<https://ejournal.poltekkes-denpasar.ac.id/index.php/icmahs>

bedroom humidity that does not meet the requirements have a 3.519 times greater risk of contracting Pulmonary TB.

Table 4. Relationship between Room Occupant Density and the Incidence of Pulmonary TB in Denpasar City

	<i>Incidence of Pulmonary TB</i>				<i>Total</i>		<i>P Value</i>
Occupant Density	<i>Casus</i>		<i>Control</i>				
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	
Not meets requirements	19	27,9	13	19,1	32	47,	0,145
Meets requirements	15	22,1	21	30,9	36	52.	
					9		
Total	34	50	34		68		
			50		100		

From the results of the statistical test, there was no relationship Room Occupant Density and the Incidence of Pulmonary TB. The calculation of Coefficient Contingency (CC) and obtained a low relationship between bedroom occupant density and the incidence of Pulmonary TB with a CC value of 0.174 while based on the Odds Ratio calculation, the result was 2.046.

Of the 68 respondents investigated, there were 44 men and 22 women. Pulmonary TB sufferers were mostly in the 21-30 year age group (38.24%) and the majority worked as self-employed (55.88%). Low awareness of the importance of maintaining cleanliness and health in the home environment, including the

bedroom, can increase the risk of transmission and development of pulmonary TB.

Factors such as poor ventilation, inadequate lighting, high humidity, and poor hygiene conditions in the bedroom can create an environment that supports the spread of *Mycobacterium tuberculosis*. Not only the sanitation of the room, an unhealthy work environment, especially in terms of lighting, humidity, and ventilation, can also increase the risk of contracting pulmonary tuberculosis for workers exposed to poor environmental conditions.

## Conclusion

There is a significant relationship between the parameters of natural lighting,



# INTERNASIONAL CONFERENCE ON MULTIDISCIPLINARY APPROACHES IN HEALTH SCIENCE

VOLUME 2 , ISSN 3032-4408 (Online)

<https://ejournal.poltekkes-denpasar.ac.id/index.php/icmahs>

temperature, humidity, and bedroom ventilation with the incidence of pulmonary tuberculosis in the Work Area of UPTD Puskesmas III South Denpasar, while the parameter of bedroom occupancy density has no significant relationship.

It is recommended that the community maintain the cleanliness of the bedroom and improve the lighting, temperature, humidity, and ventilation to prevent pulmonary tuberculosis. The Puskesmas needs to provide education about good bedroom sanitation and the dangers of pulmonary tuberculosis to the community.

## Acknowledgement

A thank you to Director of the Denpasar Ministry of Health Polytechnic and all the agencies and parties who supported this research

## Conflict of Interest

The author(s) declare that they have no conflict of interest.

## Reference

1. *PERATURAN MENTERI KESEHATAN REPUBLIK INDONESIA.*
2. Puji Widiastut, Y. *et al.* *PENGARUH KONDISI SANITASI RUMAH TERHADAP KEJADIAN PENYAKIT TB PARU.*

<http://jurnal.globalhealthsciencegroup.com/index.php/JPPP>.

*Global Tuberculosis Report 2022.*  
<http://apps.who.int/bookorders>. (2022).

Kondisi Fisik Rumah (Jenis Lantai, Pencahayaan, Kelembaban, Ventilasi, Suhu Dan Kepadatan Hunian) Mempengaruhi Kejadian Penyakit Tuberkulosis Di Wilayah Kerja Puskesmas Krian Sidoarjo Tahun 2021.

5. Romadhan, S. *et al.* *HUBUNGAN KONDISI FISIK RUMAH DENGAN KEJADIAN TUBERKULOSIS PARU DI WILAYAH KERJA PUSKESMAS BABANA KABUPATEN MAMUJU TENGAH.*
6. Febrilia, S. F., Lapau, B., Zaman, K., Mitra, M. & Rustam, M. Hubungan Faktor Manusia dan Lingkungan Rumah Terhadap Kejadian Tuberkulosis di Wilayah Kerja Puskesmas Rejosari Kota Pekanbaru. *Jurnal Kesehatan Komunitas* **8**, 436–442 (2022).
7. Kesehatan, P. & Palu, K. *JURNAL PROMOTIF PREVENTIF Hubungan Kondisi Fisik Lingkungan Rumah Dengan Kejadian TBC (Tuberculosis).* vol. 6  
<http://journal.unpacti.ac.id/index.php/JPP> (2023).