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Sanitation Conditions Of Patient Rooms And Their Relationship to Pulmonary TB Incidents In Denpasar City

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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 Denpasar Selatan, 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% 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) and humidity (p = 0.014 CC = 0.299 OR = 3.519), 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.

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 brain1. 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. 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 years3. 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 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. 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 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	
Meets requirements	13	19,1	25	19,0	38	38,0	0,003
Total	34	50	34	50	68	100	

The results of statistical tests prove that there is a relationship between lighting and the incidence of Pulmonary TB (p = 0.003). The magnitude of the relationship with a CC value of 0.335 is included in the low category. The OR value of 4.487 was obtained, which means that bedroom lighting that does not meet health requirements will increase the risk of 4.487 times greater than getting Pulmonary TB compared to bedrooms that meet the requirements.

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	
Meets requirements	12	17,6	28	41,2	40	58,8	0,000
Total	34	50	34	50	68	100	

The results of statistical tests prove that there is a relationship between temperature and the incidence of Pulmonary TB (p = 0.000). The magnitude of the relationship with a CC value of 0.431 is included in the low category. An OR value of 8.559 is obtained, which means that the temperature of a

bedroom that does not meet health requirements will increase the risk of Pulmonary TB 8.556 times greater than a bedroom that meets the requirements.

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

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

The results of statistical tests prove that there is a relationship between humidity and the incidence of Pulmonary TB (p = 0.014). The magnitude of the relationship with a CC value of 0.299 is included in the low category. The OR value obtained is 4.487, which means that the humidity of a bedroom that does not meet health requirements will increase the risk of 3.915 times greater for contracting Pulmonary TB compared to a bedroom that meets the requirements.

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

Occupant Density	***Incidence of Pulmonary TB***				***Total***		**P Value**
	Casus		***Control***				
	N	***%***	***N***	***%***	***N***	***%***	
Not meets requirements	19	27,9	13	19,1	32	47,1	
Meets requirements	15	22,1	21	30,9	36	52.9	0,145
Total	34	50	34	50	68	100	

The results of statistical tests prove that there is no significant relationship between the density of room occupants and the incidence of Pulmonary TB (p = 0.145). This can be explained when respondents are diagnosed with Pulmonary TB, there is a tendency to sleep separately from their family members. Even if there must be family members accompanying the patient, they are not always in the same room.

Lack of sunlight entering the room causes less natural lighting, causing the room to

become humid. The entry of sunlight with its ultraviolet can kill TB germs. Increasing access and entry of sunlight can be done by installing glass walls from block glass, using glass or plastic tiles, and making holes in the ceiling so that sunlight can directly enter and illuminate the room. Physical environmental factors in the room such as: inadequate lighting, high humidity, ventilation and poor hygiene conditions in the bedroom can support 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 developing pulmonary TB for workers who are exposed to poor environmental conditions.

Conclusion

There is a significant relationship between the parameters of natural lighting, temperature, and humidity with the incidence of pulmonary tuberculosis in the Work Area of UPTD Puskesmas III S Denpasar Selatan , 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, and humidity to prevent pulmonary tuberculosis. The Puskesmas needs to provide education about good bedroom sanitation and the dangers of pulmonary tuberculosis to the community.

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Conflic of Interest

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

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