

# Parents' Knowledge as a Risk Factor of Tuberculosis in Children

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**Abstract**—Tuberculosis (TB) cases in Indonesia ranked second after India. According to Indonesia Health Profile, TB prevalence in 2016 was 351,893 cases and the number increased to 360,770 (2.5%) in 2017. Sintang regency is one of the regencies in Indonesia which is endemic for TB. Sintang had 272 TB cases in 2016 and it decreased to 161 in 2017. On the other hand, Kebong Health Center recorded that TB cases in children increased from 10 cases in 2016 to 40 in 2017. It meant that 24.84% of TB cases in Sintang occurred in children. The aim of this study was to determine the risk factors of TB in children incidence at Kebong Health Center. This study was analytic observational research with a case control design. The samples were 40 cases and 40 controls. The result showed that there was a significant relationship between knowledge (p value= 0,00; OR= 36,00) and incidence of TB occurring to children. There were no relationships between exclusive breastfeeding (p value = 0.666), economic status (p value = 0.329), occupancy density (p value = 0.421), room humidity (p value = 0.561) and room temperature (p value = 1,000) with TB incidence. It could be concluded that the parents' knowledge of TB was the risk factor of TB at Kebong Health Centre. Subsequently, the cases would increase 6 times higher if there was insufficient knowledge of TB in children.

**Keywords:** *tuberculosis in children, tuberculosis incidence, Kebong Health Center*

## I. INTRODUCTION

Tuberculosis (TB) is a disease caused by bacteria that spreads from one person to another through air. TB is a debilitating and usually life-threatening illness caused by the respiratory entry of *Mycobacterium tuberculosis* complex (which includes three sub-types) into the body. The majority of TB disease presents in lungs which is known pulmonary TB. TB can also affect any organ of the body. These manifestations are referred to extra-pulmonary TB [1-2].

TB is a part of a global commitment in the Sustainable Development Goals (SDGs) that is ending TB epidemic by 2030. TB is one of the top 10 causes that lead to death

and the leading cause from a single infectious agent (above HIV/AIDS). Millions of people continue to fall sick with TB each year. In 2017, TB caused an estimated 1.3 million deaths. TB affects all countries and all age groups. Overall, in 2017, 90% adults (aged  $\geq 15$  years) that 90% of them were male, 9% were with HIV (72% of them in Africa), and the two thirds of them lived in eight countries such as India (27%), China (9%), Indonesia (8%), the Philippines (6%), Pakistan (5%), Nigeria (4%), Bangladesh (4%) and South Africa (3%). Only 6% of the cases were in WHO European region and then 3% of cases were in WHO American region [3]. Indonesia is the third largest country in the world with TB sufferers. In 2017, Indonesia contributed 8% of TB cases. According to the tuberculosis data report 2018, Indonesia was a country with a high burden of TB and HIV incidence. According to the Indonesian Health Profile in 2017, the prevalence of TB in Indonesia was 137.8/100,000 people with a total of 360,770 sufferers. The number of TB cases had increased by 17.36% compared to 2016 which the number of TB cases was 351,893. In Indonesia, the highest number of cases occurred in the large provinces with large population. They were West Java, East Java and Central Java. Based on data in 2017, the highest TB cases were found in the group of 25-34 years of age (17.32%). They were followed by the group of 45-54 years (17.09%) and the group of 35-44 years (16.43%). Meanwhile, TB cases on children were found 10.08% of all cases[4-5]. West Kalimantan is one of the provinces in Indonesia which has a high case of TB. Based on the West Kalimantan Health Profile in 2017, the prevalence of TB was 67.45/100,000 people with 5,065 cases. The number of TB cases had increased by 10.56% compared to 2016 which the number of TB cases was 4,530. Moreover, there were 271 cases of TB in children in 2017 [6]. Sintang is one of the regencies in Indonesia which is endemic for TB. TB cases in 2017 were 161 cases. In 2017, there were 44 cases of TB in children with the increased number by 25% from 2016. These cases recorded in Kebong Health Center[7-8]. TB in children causes various problems, disabilities, and even death. It depends on the

organs attacked and the cases. Early diagnosis of TB in children is very important to prevent complications and death. The accurate diagnosis of TB in children tests is done by searching mycobacterium tuberculosis (MTB) in sputum, gastric rinses, biopsies, and others. However, this examination is difficult. Most diagnoses of pediatric tuberculosis are based on clinical examination, radiological examination, and tuberculin test [9]. At Kebong Health Center, the tests of TB in children were conducted with a tuberculin test. The team of Kebong Community Health Center was suspicious of the children with malnutrition. Thus, they conducted the test to the children. As a result, the children had infected glandular TB.

**II. MATERIALS AND METHODS**

This study was analytic research with a case control research design. A case control research is an analytical study concerning how risk factors are studied using a retrospective approach. In the case control study, measurements of the independent and bound variables are not carried out at one time. The dependent variable was measured first. Then, it was traced back to measure the independent variables. The case control study design uses a group of control subjects so that the correlation results obtained are sharp [10-11].

This research was conducted at Kebong Health Center in 2017. The case population and controls in this study were 1: 1. The populations of the cases in this study were all children recorded in TB data which were 44 cases. The control populations in this study were all children who had similar characteristics to the case group at Kebong Health Center which were 44 children. The dependent variable in this study was the incidence of TB in children. While, the independent variables in this study were knowledge, economic status, exclusive breastfeeding, occupancy density, room humidity, and room temperature. The data were analyzed using chi-square test for bivariate test. Subsequently, the independent variables would be significant influence on the dependent variable if the significance level was  $p < 0.05$ .

**III. RESULTS**

Table 1 illustrates the characteristics of respondents which are education, employment, gender, and age of the children. It also illustrates the frequency distribution of the variables in this study which are exclusive breastfeeding, economic status, knowledge, air humidity, room temperature, and occupancy density. There were 56 respondents in this study.

On table 1, it can be observed that the frequency distribution was based on children's education, employment, gender, age, history of exclusive breastfeeding, economic status, knowledge, room humidity, room temperature and occupancy density

**TABLE I. THE CHARACTERISTICS OF RESPONDENTS**

<b>Education</b>		
did not complete elementary school	1	1,8
primary school	22	39,3
junior high school	9	16,1
senior high school	15	26,8
College	9	16,1
<b>Work</b>		
House wife	12	21,4
Private employees	3	5,4
Farmer	29	51,8
Other	4	20,5
<b>Age of child</b>		
12-35 Month	18	32,1
36-59 Month	38	67,9
<b>History of Exclusive Breastfeeding</b>		
Not Exclusive Breastfeeding	50	89,3
Exclusive Breastfeeding	6	10,7
<b>Economic Status</b>		
Low	44	78,6
High	12	21,4
<b>Knowledge</b>		
Not good	28	50,0
Good	28	50,0
<b>Room Humidity</b>		
Not eligible	17	30,4
Eligible	39	69,6
<b>Room Temperature</b>		
Not eligible	17	30,4
Eligible	39	69,6
<b>Occupancy Density</b>		
not eligible	30	53,6
Eligible	26	46,4

Source: Primary Data, 2018

Based on table 1, it can be seen that most of the respondents in this study had elementary school education level (39.3%) and worked as farmers (51.8%). The age of children who suffered from TB was more dominant in the group of 36-59 months of age (67.9 %). The results of the analysis also showed that the majority of respondents in this study did not get exclusive breastfeeding (89.3%). Most of the respondents were raised in family with low economic status (78.6%). There were 50% of the respondents who had sufficient knowledge of TB in children and 50% who did not get the sufficient one.

Meanwhile, the room humidity was 69.9% and room temperature was 69.6%. It meant that the respondent's house fulfilled the requirements of room humidity and temperature. Then, the occupancy density was 53.6% so it did not fulfill the requirements.

**Bivariate Analysis**

Table 2 illustrates the relationship between exclusive breastfeeding, knowledge, economic status, air humidity, room temperature and occupancy density on the incidence of TB in children. The result of chi square test showed that knowledge had significant relationship with TB in children cases with  $p \text{ value} = 0.00 > \alpha 0.05$ . It can be seen in the following table:

**TABLE II. THE RESULTS OF THE ANALYSIS OF THE RELATIONSHIP BETWEEN EXCLUSIVE BREASTFEEDING, KNOWLEDGE, ECONOMIC STATUS, AIR HUMIDITY, ROOM TEMPERATURE AND OCCUPANCY DENSITY ON THE INCIDENCE OF TB IN CHILDREN**

Variable	Child Tuberculosis				Nf	P value
	Case		Control			
	F	%	f	%		
<b>History of Exclusive Breastfeeding</b>						
Not Exclusive Breastfeeding	26	92,9	24	85,7	50	0,669
Exclusive Breastfeeding	2	7,1	4	14,3	6	
<b>Knowledge</b>						
Not Good	24	85,7	4	14,3	28	0,000
Good	4	14,3	24	85,7	28	
<b>Economic Status</b>						
Low	24	85,7	20	71,4	44	0,329
High	4	14,3	8	28,6	12	
<b>Room Humidity</b>						
Not Eligible	10	35,7	7	25,0	17	0,561
Eligible	18	64,3	21	75,0	39	
<b>Room Temperature</b>						
Not Eligible	9	32,1	8	28,6	17	1,000
Eligible	19	67,9	20	71,4	39	
<b>Occupancy Density</b>						
Not Eligible	17	60,7	13	46,4	30	0,421
eligible	11	39,3	15	53,6	26	

Source: Primary Data, 2018

Based on table 2, it can be seen that the factors in the incidence of TB in children were respondents' knowledge (p value = 0.00). The results of the statistic test also showed OR value of 36.00. It meant that respondents whose knowledge was insufficient of their children had 36 times higher in a risk of being affected by TB in children than the respondents who had sufficient knowledge.

**IV. DISCUSSION**

The results showed that the determinant factor of TB in children at Kebong Health Center was the respondents' knowledge factor. According to the results, 51.8% respondents did not know the spread of TB in children and 71.4% of them did not know the benefits of BCG immunization. Furthermore, the results showed that 57.2% of the respondents' education level was low. According to Notoatmodjo (2012), level of people's education will affect people's knowledge which are the understanding of the spread of TB, clean house and healthy lifestyle. Parents' education has played a significant role to increase their children's knowledge about contagious disease such as TB [12-13].

Knowledge, education and positive habit are very important factors to develop people's behavior. A sufficient knowledge will lead to make the right decision.

WHO recognize the importance of TB related to knowledge, attitude, and practice survey in advocacy, communication, social mobilization planning strategy [12,14].

A knowledge of disease plays a very important role in reducing the level of illness and death. Proper, appropriate and effective knowledge can stop the spread of TB in society. Knowledge and perception about TB can influence care-seeking behavior and adherence to treatment [15-16]

The previous studies have showed that there are many parents who do not have good knowledge of TB. A research conducted by Suhada et al (2015) states that there are still many parents who do not know how long TB treatment is and some respondents do not know that drugs for TB have to be consumed every day for 6 months. However 50% of the respondents know the impact of incomplete adherence to the treatment [17].

The result of another study conducted by Verna et al (2017) show that parents knowledge about TB is low and people have misunderstanding about this disease. There are 26.1% of the respondents who have never heard about TB, 21.8% of the respondents who not know that TB can be cured with the right drug dose, 23,3% of the respondents do not know that TB drugs have been available in public health institutions, and more than a third of the respondents (around 35%) do not know about the cost of TB Health care [2].

In addition, according to a research conducted by Jirapaiboonsuk (2010), there are 60% of the respondent that have poor knowledge about TB in children. It shows that there is inadequate public health education. As a result, 49.3% of the respondents ahve heard about TB in children and 94.8% of the respondents know that TB is contagious. In addition, the majority of the respondents (85.3%) knows that cough is the symptoms of TB and only a few of them know the other symptoms of TB [18].

**V. CONCLUSION**

The determinant factors of TB in children at Kebong Community Health Center were the poor knowledge of respondents' parents. The risk factor of TB children was 36 times higher than the parents with good knowledge of TB. It was necessary to improve the respondents' knowledge of the spread of TB in children, prevention of TB in children, and the benefits of BCG immunization in order to give knowledge to many respondents with insufficient understanding of TB.

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