

# The Influence of Knowledge, Lifestyle and Culture on the Incidence of Tuberculosis A Literature Review

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## Abstract

**Background:** TB is a public health problem whose incidence is still high in Timor Leste. TB is an infectious disease which is one of the leading causes of death in the world caused by an infectious agent *Mycobacterium tuberculosis*. The purpose of this study was to review scientific articles focusing on the Influence of Knowledge, Lifestyle and Culture on the Incidence of Tuberculosis. **Method:** The method used was a literature review. Articles used as literature review materials came from SagePub, BMC Public Health, Elsevier, Google Scholar, Pubmed, Proquest and others. The articles were selected based on the research focus, which was the Influence of Knowledge, Lifestyle and Culture on the Incidence of Tuberculosis. **Results and Conclusions:** Knowledge is very important in TB control efforts. Good knowledge needs to be followed by a good perception. Such knowledge is not only for the TB patients but also for the families and health workers. Lifestyles that are very risky to increase health vulnerability in TB patients are smoking, drinking alcohol, using illegal drugs, inadequate consumption, living in a slum environment, lack of air ventilation, lack of exercise, lack of sleep, urban life, lack of glycemic control, sugar consumption, and living with TB patients. Cultural influences include inter-racial disparities, culture of seeking local treatment or not going to health facilities, delay in initial screening, TB sputum examination, lack of PPE, poor local TB surveillance, traditional medicine, stigma and culture carried by

**Keywords:** *Tuberculosis, Knowledge, Lifestyle, Culture*

## Introduction

TB is an infectious disease which is one of the leading causes of death in the world caused by an infectious agent *Mycobacterium tuberculosis*. TB can affect anyone, but generally occurs in adults. TB is curable and preventable. As much as 85% of TB sufferers recover after receiving TB treatment<sup>(1)</sup>.

The incidence rate of tuberculosis in Indonesia in 2018 was 316 per 100,000 population and the death rate for tuberculosis sufferers was 40 per 100,000 population. In 2019, the number of tuberculosis cases found was 543,874 cases. The highest number of cases were reported from provinces with large populations, including West Java, East Java and Central Java. The Case Detection Rate of tuberculosis cases in 2019 was 64.5%. However, it is still far from the CDR figure recommended by WHO which is  $\geq 90\%$ . The national success rate for tuberculosis treatment has been

achieved, including in 2019 which amounted to 86.6%<sup>(2)</sup>. Timor-Leste has the second highest TB incidence rate in the Southeast Asia Region. According to data released by WHO in 2018, the total incidence of TB in Timor-Leste was 498 per 100,000 population. In comparison, the incidence rate in Indonesia is 316 per 100,000, in India 199 per 100,000, and in China 61 per 100,000 population. This article conducted a literature review on the risk factors for TB in the form of knowledge, lifestyle and culture to increase TB prevalence in Timor-Leste<sup>(1)</sup>.

Tuberculosis problem in Timor-Leste is quite complex, from MDR TB, relapse, treatment compliance, stigma, community lifestyle, smoking culture, income, poverty, public trust, surveillance that needs to be improved, late arrival to health facilities and other factors. Dewi et al<sup>(3)</sup> stated that the patient's lack of knowledge, the delay in going to health facilities, the patient's ignorance of TB symptoms, as well as the

delay in health workers to take sputum also contributed to the TB problem in Yogyakarta. Family support and knowledge are also very important in TB control in Indonesia<sup>(4)</sup>. This article conducted a literature review on the risk factors of TB in the form of knowledge, lifestyle and culture to increase TB prevalence in Timor-Leste.

## Methods

This article is a Literature Review article that focuses on Tuberculosis and the factors of Knowledge, Lifestyle and Culture. Articles used as literature review materials were from SagePub, BMC Public Health, Elsevier, Google Scholar, Pubmed, Proquest and others. The articles were selected based on the research focus, which was the Effect of Knowledge, Lifestyle and Culture on the Incidence of Tuberculosis.

## Result

### Risk Factors

#### 1. Knowledge

Knowledge about the symptoms, treatment and prevention of TB is one very important factor in the effort to TB control<sup>(5)</sup>. Increased knowledge about TB is very important in the treatment and control of TB. TB Patient Knowledge can be changed and improved. The results showed that, when TB was diagnosed initially, TB patients had a moderate of 52.4% knowledge. The knowledge is significantly associated with the condition of the ability to read, education and income. Gradually, after doing the treatment program, the patient's knowledge about TB increases. This is certainly very important to succeed TB control and treatment. Knowledge is also very important to encourage the adherence to take TB drugs<sup>(6)</sup>.

Recent research on the importance of Knowledge to the success of TB programs was conducted in Lesotho. Lesotho is one of the countries with the largest TB cases in the world and country with the worst incidence of TB-HIV co-infection in the world. This study focused on the knowledge and attitude associated with risk factor of TB in the general population. Some questions about TB were asked to respondents. The research questions consisted of 15 questions consisting of questions related to TB, TB symptoms, transmission and TB treatment. In general, TB knowledge in the community of Lesotho

was good. However, efforts to increase knowledge need to be made on people who cannot read, rural people, unmarried people and farmers. This is because there is a very significant difference in knowledge between these groups<sup>(7)</sup>.

Related research on knowledge was done at the Health Center in Iraq. This research was conducted in a special health facility for children, women and the elderly. The results of the study were quite biased because the selection of respondents was based on the position of the new patient in the Polyclinic. The results showed that there were differences in the patient's knowledge about TB for each room in the Polyclinic. The result was certainly quite biased because the selection of respondents was not done well<sup>(8)</sup>.

The measurement of knowledge regarding infection prevention and infection in household contacts was carried out by Researchers in India. This study was conducted considering that household contacts are the people most at risk for contracting TB from TB patients<sup>(9)</sup>. Knowledge measured was knowledge about TB, mode of transmission and prevention of transmission. The research result from the verifiers indicated that their level of knowledge was low and the economic conditions which was poor is one of the indirect risk factors of TB transmission in households. It is important for India to be able to develop family level communication tools and media so that transmission at the family level can be minimized properly.

Research related to TB knowledge among students was conducted in Indonesia. The research stated that the factors of gender, educational background before school and college courses will affect knowledge associated TB. The knowledge of female student is better than men's. Meanwhile, students who chose health as the main interest have a better knowledge than those who chose other interests<sup>(10)</sup>.

In the general public in Indonesia, knowledge is very important in TB Control efforts. In urban communities, knowledge about TB is very good<sup>(11)</sup>. The level of knowledge is influenced by the educational level. Perceptions related to TB disease are also influenced by family income with a positive correlation. Perception will be important for successful TB treatment<sup>(12)</sup>. Good knowledge also needs to be followed by a good

perception regarding TB treatment. Organization of health workers is also important<sup>(13)</sup>. Studies in Indonesia still found delays in case contact tracing, delays in sputum collection and suboptimal TB surveillance.

Research on community was done in Somalia to measure individual's knowledge and attitude against TB. The interesting thing about this research is that knowledge about TB care is not followed by knowledge of the causes and transmission of TB. Such thing makes the number of TB incidence remains high. Health education needs to be done in order to increase knowledge about TB comprehensively so that TB control efforts can be carried out properly<sup>(14)</sup>.

## 2. Lifestyle

Lifestyle such as smoking is one of the risk factors that can aggravate TB. A study in Mexico found that 60 adults smoked<sup>(15)</sup>. The government's efforts to increase the tobacco tax have proven to be able to provide changes such as a reduction in the number of smokers and a decrease in TB prevalence. This is because these efforts can improve the national TB prevention program. However, other risk factors that need to be considered are alcohol consumption, nutrition, housing conditions and food security.

Smoking behavior is one of the major obstacles in efforts to prognosis and outcome of TB. Study in Malaysia<sup>(16)</sup> stated that 83% of TB patients have smoking behavior. Smoking behavior has a very strong influence on the success and treatment of TB. Smoking is statistically a major barrier to TB treatment<sup>(17)</sup>. Furthermore, smoking cessation is one of the most appropriate ways to increase the success of TB treatment and to prevent TB drug resistance.

A study in Spain stated that smoking is one of the keys to the success of the TB program. TB patients in Spain are mostly smokers<sup>(18)</sup>. One of the government's efforts to control TB is to control the smoking behavior. This is done to support TB control and monitoring the programs in the country.

Likewise in South Africa, smoking is one of the major obstacles in the effort to control TB and HIV<sup>(19)</sup>. In southern Africa, the TB-HIV program is an important program. The interesting thing is that most of them

know that smoking can worsen their health condition so they voluntarily quit smoking. However, this certainly needs to be evaluated in order to support the success of the TB Program.

TB problems and smoking behavior are major problems in *many low- and middle-income countries*<sup>(20)</sup>. Several efforts need to be made to stop smoking behavior, especially in TB patients. Treatment assistance and ongoing evaluation are still needed to support the success of the national TB control program. In *low- and middle-income* countries, smoking plays a major role in increasing the risk of TB, treatment failure and is very susceptible to cause relapse.

The Colombo study was conducted on the lifestyle of TB patients. In this study, it was informed that when TB patients were convicted of having TB, they restricted various activities that were usually carried out at home. In terms of employment, 27.7% of them were required to retired voluntarily, some of them change jobs, even temporarily laid off. On an income basis, 51% stated that they lost some of their income. When they became TB patients, they stop having recreation in public places and stop hanging out with friends. The most interesting thing is that 72% said that they wanted to stop smoking totally and 64.7% stop drinking alcohol. This is a form of positive life change due to the health promotion efforts undertaken by the local health authorities<sup>(21)</sup>.

A cohort study was conducted in Indonesia regarding the No Smoking Area program and the Stop smoking program for TB patients that has been implemented<sup>(22)</sup>. Local regulation about KTR (No Smoking Area in Public Facility) has been implemented in all Indonesian health facilities. All forms of activities and promotions related to smoking are prohibited in health facilities and certain places in Indonesia. The existence of this KTR also helps efforts to reduce smoking behavior in public places and health facilities. This is certainly very important considering smoking can significantly affect the incidence of TB, the treatment and the outcome of TB. Smoking behavior can also cause delay in diagnosis, failure of TB treatment and even cause death due to TB. Efforts to quit smoking in TB sufferers are one of the best ways to prevent bad things as a result of TB<sup>(23)</sup>. Research in Indonesia stated that 77.6% of TB sufferers are active smokers. One of the efforts made

by the Indonesian government is an effort to promote health for 5-10 minutes to reduce or even stop smoking every time a TB patient comes to a health facility. This effort is running maximally, in which 86.1% of TB patients stated that they had stopped smoking completely for 6 months. This is certainly very good for the efforts to deal with TB in Indonesia.

The lifestyle of TB patients who adhere to treatment will change in a positive direction. This is evidenced by research conducted in Sri Lanka. During treatment, all TB patients tended to reduce risky behaviors such as smoking, hanging out with friends or family, consuming alcohol, and using illegal drugs<sup>(24)</sup>. Socio-economic conditions will greatly affect the life style of TB patients. However, when they are in the TB treatment program, they try to change their lifestyle to be better. This is certainly very good to support the success of the treatment program that is being implemented.

Nutritional consumption patterns will also have an indirect effect on TB disease<sup>(25,26)</sup>. Study in Canada<sup>(27)</sup> on 200 patients at Quebec in Canada generated information that nutritional deficiencies can lower a person's body immunity. This makes a person more susceptible to contract diseases, including TB. Vitamin and mineral intake are not proven to reduce the immunity with OR equals to 2.1. In addition, carbohydrates and vitamins are also important nutrients to increase endurance. The new fact states that living in a small flat with poor air circulation, poor access to clean water, alcohol consumption and smoking are risk factors that can aggravate TB<sup>(28)</sup>.

TB with DM is one of the things that needs to be considered in the TB control program. Studies showed that someone with DM and insulin consumption, is more susceptible to be infected by TB. This study was conducted in Australia<sup>(29)</sup>. DM can increase the risk of developing TB to become more severe, failure of TB treatment, relapse, and can even lead to death<sup>(30)</sup>.

Other lifestyle that also affects TB is the lack of exercise which causes obesity (OR = 4.40, 95% CI 1.27-15.25 and 2.38 (1.61-9.22), sleep less than 8 hours at night (OR = 1.75, 95% CI 1.01-3.01), and physical activity of less than 3 days/week [OR = 1.41, 95% CI 1.21-3.47] <sup>(31)</sup>. Besides urban life, monotonous lifestyle, glycemic control and high sugar consumption in TB

patients with DM is also a risk factor that can worsen TB patients<sup>(32)</sup>. Maintaining a safe distance from people with TB symptoms, avoiding rook smoke and not smoking are behaviors that can prevent to be infected by TB<sup>(33)</sup>.

### 3. Cultural Influences

A study was conducted in Michigan, US to look at disparities in existing races with TB incidence. Until now, disparities related to TB still occur in Michigan, especially related to race, age and origin. This makes transmission of the TB still common. This study was conducted on TB Trends for 9 years by analyzing 1,245 TB cases in that state. Blacks have a potential TB incidence 24 times greater than Whites. The existence of very far disparities certainly needs to be followed by a comprehensive approach to tackle the existing TB<sup>(34)</sup>. Different cultures and life styles between Black and White are the basis for future TB control programs. A follow-up study stated that a social environment also needs to be considered in solving TB which also involves Race<sup>(35,36)</sup>.

The culture drivers and TB in Vanuatu are very unique. TB sufferers still consume alcohol, cigarettes and still do *Kastom* (local culture). Stigma in the community is still high. Most of them still believe in Traditional Medicine compared to Modern TB Medicine which has complied with WHO guidelines<sup>(37)</sup>. They even spend up to two weeks before going to a health facility. Health education is very important so that TB treatment can be carried out properly and in accordance with WHO guidelines, and efforts to prevent transmission can be prevented as early as possible.

Sweden is a developed country in Europe. However, TB-related problems can arise from immigrants who come from various countries with a high burden of TB cases. This is certainly a little difficult, considering that immigrants are certainly still thick with the culture they come from<sup>(38)</sup>. Culture is also related to the level of knowledge they have. A migrant who has a length of education less than 12 years is more prone to prevent the transmission of diseases including TB<sup>(39)</sup>. The same thing happened in London. Migrants will be more susceptible to be exposed or suffered from TB related to genetics, Vitamin D deficiency, comorbid, socioeconomic and migration-related<sup>(40)</sup>. The Difference related TB cases Culture and Gender also happened in Italy<sup>(41)</sup>. The number of TB cases in native Italy and other countries

is always higher than the migrants<sup>(42,43)</sup>.

Valid, complete and reliable TB data is a problem in various countries in Africa<sup>(30)</sup>. Data originating from TB surveillance will certainly have various impacts on the decision making. Evaluation system of surveillance conducted obtained information that the data from various levels of health institutions are not the same. TB surveillance improvement is very necessary to produce valid and reliable information. Standard surveillance guidelines, good systems, and surveillance officers who can work well are needed in addition to related agencies to periodically monitor the operation of the surveillance<sup>(44)</sup>. Active case finding, case tracking and good cooperation between the government and NGOs will play an important role in the success of TB surveillance program. Therefore, the collaboration must be done well<sup>(45,46)</sup>. The research was also supported by the results of research in China stating that 25% TB of data in hospitals is not reported well. Various problems encountered are, surveillance officers who are less reliable, workload that exceeds the ability, poor supervision and records at the local and national levels that are not well integrated<sup>(47)</sup>.

Different language cultures between patients and health workers can be a barrier to the success of TB suppression program. Besides traditional medicine, stigma, and the desire of people who prefer traditional medicine to treatment in health centers also become obstacles. This is also exacerbated by the insufficient availability of self-protecting devices for health workers. Inadequate training for health workers and TB patients add to the complexity of TB resolution in South Africa<sup>(48)</sup>. In South Africa, it was also mentioned that 20 types of herbs were developed which were used for treating TB. *Allium sativum L. (Liliaceae)* and *Strychnos decussata (Pappe) Gilg.* Strychnaceae is the most frequently used and claimed to have proven successful use<sup>(49)</sup>. This requires further action and research by WHO to prevent MDR TB.

### Conclusion

The results of the literature review state that knowledge is very important in TB control efforts. Good knowledge needs to be followed by a good perception. This knowledge is not only in TB patients but also in families and health workers. Lifestyles that are

very risky to increase health vulnerability in TB patients are smoking, drinking alcohol, use of illegal drugs, inadequate consumption, living in a slum environment, lack of air ventilation, lack of exercise, lack of sleep, urban life, lack of glycemic control, consumption of sugar, and living together with TB patients. Cultural influences include disparity on race, culture of seeking local treatment or not going to health facilities, delay in initial screening, TB sputum examination, lack of PPE, poor local TB surveillance, traditional medicine, stigma and culture carried by migrants.

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