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Lifestyle Factors Associated with Adolescent Tuberculosis Patients : Systematic Literature Review

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ABSTRACT
Tuberculosis bacteria (Mycobacterium tuberculosis) can result in infectious disease, namely Pulmonary TB. Nearly one-third of the population in the world has been infected with Pulmonary TB and most Pulmonary TB patients are those at productive age (15-50 years old). Pulmonary TB can spread to other body organs, such as brain layers, kidneys, bones, and lymph nodes. Pulmonary TB becomes a health issuein the world, especially in developing countries. Therefore, a literature review is needed to dig up information on adolescent lifestyle with pulmonary TB incidence. This study aimed to identify the correlation between adolescent lifestyle and pulmonary TB incidence. The method used in compiling this article was criticalreview. Proquest (within 2016-2021) and Google Scholar (within2016-2021) are the databasesused in this review. The keywords used in this study were lifestyle, pulmonary TB incidence, and adolescents. 5 articles in this study were found relevant to the aim and the review criteria. These 5 articles obtained a result regarding lifestyle and pulmonary TB incidence in adolescents, including knowledge, health education, smoking, drinking alcohol, and having outdoor activities at night. All of these journals showed that lifestyle caused pulmonary TB incidence in adolescents. This review concludes that lifestyle can affect pulmonary TB incidence in adolescents. Smoking and having outdoor activities at night are the dominant factors causing pulmonary TB incidence in adolescents.
KEYWORDS: Lifestyle, Pulmonary TB Incidence, and Adolescents

I. INTRODUCTION

In the modern era, changes in lifestyle regarding health behavior occur in adolescents. Several diseases can happen as a result of lifestyle changes. One of the risks of disorders occurring due to modern and unhealthy lifestyle is pulmonary TB. In the world, the mortality rate and illness due to Mycobacterium Tuberculosisare categorized as high. In (2019),around 1.7 million peoplewere died due to pulmonary TB. Besides, around 9.4 million new cases of pulmonary TB and one-third ofthe population in the world has been infected with pulmonary TB, which most pulmonary TB patients are those at productive age or around 15-55 years old) (*the Report from TB Sub-Directorate, Ministry of Health*, 2020). WHO,in 2011,also reported that more than 250 thousand adolescents were infected with pulmonary TB with a mortality rate of 100 thousand adolescents annually. The total number of pulmonary TB patients in adolescents reached around 10% up to 12% from the overall total of TB casesaround the world.

It was estimated nearly800,000 new TB cases among adolescents in 2019 (around180,000 in people in the age group 10-14 and around 617,000 in adolescents aged 15-19 years). Even though the risk for TB is lower in young adults, the endemic setting of TB significantly increases between early adolescents and young adults (even in the setting with low HIV prevention) (The Global Fund, 2016). Meanwhile, WHO (2016) mentioned that Tuberculosis (TB) in adolescents, different from tuberculosis (TB) in children, tends to be more infectious than tuberculosis in younger children, so it can interfere the adolescents' school and social development.

Indonesia is the country with the third-highestcontribution topulmonary TB patients in the world, after India and China. The total Indonesian population diagnosed with pulmonary TB by medical officers in 2013 was 0.4%, indicating that, in every 100,000 population, 400 people were diagnosed with pulmonary TB.Based on the Indonesian people's characteristics, the prevalence of pulmonary TB will tend to increase in adulthood, people with low education, and people with lower socioeconomic status (Basic Health Research, 2019).

Indonesia experienced an increasing trend in pulmonary TB prevalence in 2014 of 647 per100,000

people from 272 per 100,000 people in2018; the incidence rate in 2019was 399 per 100,000 people compared to the rate in the previous year was 183 per 100,000 people. Similarly, the mortality rate due to TB in 2019was 41 per 100,000 residents; previously it was only 25 per 100,000 residentsin2018. The data did not cover the patients screened by medical officers (WHO, Global Tuberculosis Report, 2019).

Lifestyle with pulmonary TB incidence in adolescents is an opportunistic infectious disease frequently found in HIV/AIDS patients. According to the report by WHO in the Global TuberculosisControl(2019) in 2020, around 1.1 million new TB casesin HIV patients, and the total number of patients reported dead due to TB in HIV-positive patients reached 350 thousand. Nearly 13% of new TB cases were found in HIV patients. Tuberculosis is a serious health issue and a primary cause of morbidity and mortality in HIV patients.

Velayutham *et al.* (2020) stated that smoking habit was frequently found in male adolescents (25%) compared to female adolescents (19%). Most adolescents with asmoking habit are from a family consisting of active smokers; their siblings and friends offered them a cigarette. Meanwhile, Chandrasekaran *et al.*, (2018) conducted a case-control study in Brazil investigating the factors of TB in adolescents, stating that the proportion of a smoking habit in adolescents increased by 50%.

According to Bhargava*et al*., (2021),the knowledge of TB acquisition and transmission was sufficient, yet followed by misconceptions. It is important to eliminate myths and misconceptions about TB and replace them with the correct knowledge. To achieve this goal, it is important to educate adolescents, family members, and communities.This article aimed to identify the correlation between lifestyle and pulmonary TB incidence in adolescents.

II. METHOD

This article was aliterature reviewfrom several originalarticles. A literature reviewis a formal review of research articles by using a critical thinking technique, including the use of logical reasoning, accurate summaries, analyses, arguments, and an evaluation of information (Aysem, 2009). The studies included here were those explaining the correlation between lifestyle, pulmonary TB incidence in adolescents, and adolescents' education on pulmonary TB. ProQuest and Google Scholar were the databases used in thisreview. The keywords used here were Lifestyle, pulmonary TB incidence, and Adolescents. Those keywords were inter-combined to obtain a more specific search result. The search was conducted in January 2018 with a publication year limit, namely from 2016 to 2021.

III. RESULT

The total search result of articles with predetermined keywords was 150 articles with the following detail: 100 articles from ProQuest and 50 articles from Google Scholar. 95 articles were collected through selecting titles, and it decreased to 65 articles through a suitability screening to the objective of the review. 40 articles were excluded because they did not meet the predetermined criteria. Once a further screening matched the design and correlated with the nursing implications, 5 articles were selected; the topic consisted of smoking habit as a lifestyle (Lesnic *et al*, 2016; Wessel *et al*., 2019; Cope *et al.*, 2017), the habit of drinking alcohol (Sinaga *et al*., 2018); Simou *et al*., 2018), and knowledge (Fadmi, 2020; Turner, 2019).

IV. DISCUSSION

The current life of adolescents is dealing with a rapid social change from traditional community to modern community and a strongly complex modern lifestyle as a product of technological advancement. Lifestyle as an individual's way of life is identified by the way adolescents spend their time.Around 80% of adolescents aged 11-15 years were reported to show a high-risk behavior with a minimum of once in the period, such asmisbehavior at school, drug abuse, and antisocial behavior (such as stealing, having a fight, or being absent from school) and 50% of the adolescents also show other high-risk behaviors, such as drunk driving, having sexual intercourse without any contraception, and minor crimes. A study showed that adolescents had ever used marijuana (50%), smoked (65%), and consumedalcohol (82%) (Lesnic *et al*, 2016).

Most high-risk patients coinfected with HIV/TB are found in the occurrence of active TB, from both reactivationsof the latent infection and progressivity of new infections. The risk for TB occurrence in HIV patients increased by 5-15% annually caused by reactivations of the latent infection, so it depended on the degree owned by immunocompromised patients in HIV/AIDS patients. A study in gold miners in South Africa showed that the risk of Tuberculosis became double the previous number in a year of HIV infection, but it insignificantly increased in the next few years.

Toxins caused by cigarettes will be accumulated in the body along with the duration of smoking; the longer they smoke, the effects are getting more dangerous (Wessel *et al*., 2019). According to Cope *et al.*, (2017), cigarette smoke emits dozens of chemical substances endangering health, and, generally, those chemical substances are toxic. In cigarette smoke, 4,000 chemical substances are found dangerous.

A study conducted by Wessel *et al*., (2019) stated that smoking habit was frequently found in male

adolescents (25%) compared to femaleadolescents (19%). The adolescents with a smoking habit are frequently from a family with active smokers, siblings, and friends who offered them cigarettes. Meanwhile Cope *et al.,* (2017) investigating the factor of TB in adolescents with a case-control study as a method in Brazil stated that a smoking habit in adolescents increased by 50%.

In line with a study conducted byLesnic *et al,* (2016) in the United States stated that the evidence of a correlation betweensmoking habit, passive smokers, and air pollution in a room with firewood and coal toward the risk of infections, diseases, and mortality due to TBC. From around 100 investigated people, it was found that the proportion of people who smoked tobacco and suffered from TB was 33 people, 5 peoplebeing passive smokers and suffering from TB, and 5 people being infected with air pollution and suffering from TB. Another study conducted in South Africa showed the correlation between passive smokers and the increased risk of Mycobacterium tuberculosis infection in children living in the same house with TB patients. In line with a study conducted by Simou *et al*., (2018) inthe Netherlands revealed that tuberculosis and smoking were two significant public health issues. The correlation between passive smokers and TB infection in children becomes a vital thought matter considering the high prevalence of smoking and tuberculosis in developing countries.

Paradkar *et al*., (2020) evaluated the awareness level of TB among adolescents in poor populations in urban areas. The study above was conducted on adolescents aged around 13-19 years for 3 months in poor populations in urban areas using pre-design and pretest as the model. It stated that knowledge of TB transmission was important to eliminate the myths andmisconceptions about TB and replace it with the correct knowledge. So, it is essential to educate adolescents, family members, and communities by changing the adolescents' lifestyles to avoid being infected with TB.

V. CONCLUSION

Based on the result, the conclusion obtained from the article above is that adolescents do not know several types of healthy lifestyles yet. Several factors can result inunhealthy lifestyles, such as smoking, drinking alcohol, and frequently having outdoor activities at night. The adolescents are expected to have behavioral changes after receiving health information about pulmonary TB. Besides, support from close people is strongly needed to motivate the adolescents to recover, so they can interact with other people anymore.

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