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Original Research

Factors Contributing to TB at Primary Health Center in Sidoarjo - Indonesia

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ABSTRACT

Introduction: Tuberculosis (TB) is caused by Mycobacterium tuberculosis, and remains a burden in Indonesia. Many factors contribute to the TB prevalence, including age, sex, body mass index, sputum smear conversion, HIV infection, and Diabetes Mellitus. The objective of this study is to identify factors contributing to TB prevalency at the primary health center.

Methods: This research used as a cross-sectional study and was conducted in March 2020. The population of this study was TB patients at Porong Primary Health Center in Sidoarjo, East Java Province, Indonesia. Samples were all TB patients who registered in Porong Primary Health Center and were taken by total sampling. The sample size was 51 TB patients. There were no inclusion and exclusion samples criteria implemented. Data were collected that used the secondary data of TB Patients Registration, between 1st – 31st March April 2020. Data were analyzed using frequency distribution with SPSS Version 21.

Results: Result shows there were 30 (58.80%) male TB patients, 34(66.70%) TB patients were adults, 48 (94.10%) TB patients had sputum smear conversion from positive to negative after two months DOTS therapy, there were 48 (94,10%) TB patients not infected by HIV Virus, and there were 36 (70,60%) TB patients had a history of Diabetes Mellitus.

Conclusion: Factors contributing to TB prevalence are many, including age, sex, body mass index, sputum smear conversion, HIV infected, and Diabetes Mellitus. To improve care of TB patients requires integration and comprehension of care at the primary health center.

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INTRODUCTION

Indonesia is the third country with the highest TB prevalence after India and China. The high prevalence of TB is partly because the case finding and complete treatment requires a long time while the spread of TB is very fast (World Health Organization, 2019). It is estimated that the incidence of new TB in Indonesia is 399 per 100,000 population (total TB cases 1,000,000).

Sidoarjo is the third-largest contributor to Lung TB sufferers in East Java Province after Surabaya City and Jember Regency (Dinkes, 2016). The total number of cases of pulmonary TB in Sidoarjo in 2018 was 2153 patients. Among these patients, there were 50 patients or 5% who were grouped out of the DOTS treatment program (Sidoarjo, 2018). A large number of cases are caused by the transmission of mycobacterium tuberculosis from TB patient to the new host. Many people do not understand the transmission of Mycobacterium tuberculosis. Many factors affect the prevalence of TB, such as age, HIV infection, the natural history of TB, hygiene, and socioeconomic condition (Pai *et al.*, 2016).

Prevalence of TB infection in the U.S. is related to various factors: age, sex, race/ethnicity, poverty, educational level, birthplace, diabetes, body mass index, cigarette smoking status, and HIV status (Miramontes *et al.*, 2015). The benefit that is taken by this research result is the provider will use different strategies to solve TB patients' problems according to the factors so that TB patients complete the DOTS program successfully. Thus, it is needed to identify

factors contributing prevalence to TB in Kabupaten Sidoarjo, East Java, Indonesia.

MATERIALS AND METHODS

This research was conducted on a cross-sectional study. The population and sample are all TB patients who registered as TB Patients at Porong Primary Health Center between January to September 2019. Sampling this research was Total Sampling, with sample size are 51 TB patients. The variables in this research are sex, age, sputum smear conversion, HIV infected, and Diabetes Mellitus. Data were collected using secondary data of TB Patients Registration at the Porong Primary Health Center. Data were presented and statistically analyzed using frequency distribution by SPSS version 21. This research has been ethically tested at the Ethical Board of Faculty of Nursing, Universitas Airlangga by number 1970-KEP.

RESULTS

Most respondents (58.80%) were male and 66.70% were adults. Age of TB patient between a minimum of 7 years old and a maximum of 68 years old as well as the average age of TB patients was 42.82 years old. In addition, 94.10% respondents have sputum smear conversion from positive to negative after two months of DOTS therapy, 70.60% respondents suffering Diabetes Mellitus and only three respondents (5.90%) were infected by HIV as well (see Table 1).

Table 1. Characteristics of respondents (n=51)

Characteristics	n	%
Sex		
Male	30	58.8
Female	21	41.2
Age Group		
Child	8	15.7
Adult	34	66.7
Elderly	9	17.6
Sputum Smear Conversion		
Negative	48	94.1
Positive	3	5.9
HIV Infection		
Negative	48	94.1
Positive	3	5.9
Diabetes Mellitus		
Not Presence	36	70.6
Presence	15	29.4

DISCUSSION

The results showed that the number of men with TB patients was more than women at Porong Primary Health Center by the year 2019. Most patients were male (61.2%), according to data collected from four endemics-countries: Indonesia, Peru, Romania, and South Africa (Ugarte-Gil *et al.*, 2019). The incidence of TB is approximately twofold higher in men than in women, and approximately 10% of all new cases are children (Pai *et al.*, 2016). These phenomena may relate to behavior. The behaviors related to TB patient are less exercise, smoke, bad diets, and low adherence to TB therapy.

The highest rate prevalence of TB was significantly associated with an adult (21-60 years old). Latent Tuberculosis Infection prevalence increased with age, with a prevalence of 29.4% among Singapore-born aged 70–79 years (Yap *et al.*, 2018). The point of prevalence of TB infection probably rose with age group, with the elderly group more sensitive than the young men group, related to the ability of the body to protect against the agents, especially against mycobacterium tuberculosis.

There were 6% percent of TB patients still showing a positive result of sputum smear after two months period of time treatment with DOTS. The proportion of pulmonary tuberculosis AFB positive patients was sputum smear conversion 33.3% and no sputum smear conversion 66.7% in Labuang Baji hospital and Lung Health Center, Makasar (Supardi, Sudaryo and Thaha, 2019). Sputum smear conversion indicates that TB patients are responsive to the DOTS treatment. Health education is the most needed for TB patients, so that they understand tuberculosis and prevent airborne transmission to other men and women.

There were six (3%) TB patients with presence of HIV in their body. It can be concluded that effort toward the detection of TB-HIV within the optimal range yields both epidemic and economic gains (Supardi, Sudaryo and Thaha, 2019). The strongest factors among the TB patients were HIV infection: 12% of all new active TB cases and 25% of TB-related deaths with HIV Infection individuals (Pai *et al.*, 2016). TB patients with HIV infection need special treatment to prevent them from developing an active TB; they need tuberculosis preventive therapy (i.e., treatment for asymptomatic latent tuberculosis infection) (Saunders and Evans, 2019). TB is a contagious disease that results from being infected with a bacteria called mycobacterium tuberculosis. Unfortunately, people with HIV have a low level of immunity, as a result, they will be easier infected by microorganisms, especially mycobacterium tuberculosis.

One-third of TB patients at Porong Primary Health Center suffer Diabetes Mellitus, which raises the patient's risk factor to active TB and worsens TB outcomes (Ugarte-Gil *et al.*, 2019). In Diabetes Mellitus it is primarily known that many patients are unable to control blood glucose level Diabetes Mellitus attacks all human organs especially lung, and it worsens TB outcomes. It is important to improve the management of TB and Diabetes Mellitus therapy (Ugarte-Gil *et al.*, 2019). Improving support for patients with tuberculosis is a major priority for governments especially based on digital platforms to raise TB patients' adherence to treatment(Yoeli *et al.*, 2019). TB patients need to maintain their blood glucose level every month, promote a balanced diet, maintain physical examination, and maintain

adherence to taking all medicine every day on schedule.

CONCLUSION

Factors contributing to TB prevalence are many, including age, sex, body mass index, sputum smear conversion, HIV infection, and Diabetes Mellitus. To improve care of TB patients requires integration and comprehension of care including, improved health-related behavior, health education, immunization, and social support of care for TB patients. Furthermore, this can be used to improve health promotion and prevention of TB, especially at primary health centers.

CONFLICT OF INTEREST

All authors declare no competing interests.

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