Occupational Status and Educational Stage as a Valuable Factors Affecting Knowledge and Perception Level of Indonesian Tuberculosis Patient

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Abstract

Introduction: Indonesia has the second highest prevalence for Tuberculosis (TB) cases, with approximately two-thirds of the patients undiagnosed. Some research had investigated several aspects supporting TB new case finding a program, such as knowledge and perception while factors that affect those aspects e.g., occupational status and educational stage have not been much researched yet in Indonesia.

Objective: This study aimed to identify the level of knowledge and perception regarding tuberculosis and their correlation with occupational status and educational stage.

Method: An observational analytic study with the cross-sectional design conducted. A total of 51 pulmonary TB outpatients were collected and interviewed. A questionnaire was designed to obtain comprehensive information about the variables studied which consists of patient's demographic status (age, gender, occupational status, and educational stage), along with patient knowledge and perception regarding tuberculosis. Parameters of patient understanding and perception classified as good or low based on average score.

Results: The result was analyzed using Coefficient Lambda revealing a significant correlation between occupational status with a level of perception ($r = 0.421$, $p = 0.025$), while no significant correlation for the level of knowledge ($p = 0.000$). Spearman analysis found significant correlation between last educational stage with level of education ($r = 0.569$, $p = 0.000$), while no significant correlation for level of perception ($r = 0.200$, $p = 0.159$).

Conclusion: Occupational status is an essential factor for enhancing the knowledge level of TB patient, and last educational stage is a valuable factor for intensifying level of perception of TB patient. These results will provide information for government along with healthcare workers to enhance effective health promotion program regarding knowledge and perception for tuberculosis.

Keyword: *Tuberculosis or TB; Occupation Status; Level of Knowledge; Level of Perception.*

Introduction

Indonesia has the second highest prevalence for Tuberculosis (TB) cases with 1,017,378 new active TB cases found in 2015[(1)] and approximately two-thirds of the patients undiagnosed with care status of them remained unknown[(2)]. This high burden disease is the third leading contributor of all mortality and four most top cause for disability-adjusted life years (DALYs)[(2,3)]. Delay in diagnosis and case detection are factors that promote this condition[(4,5)]. To resolve those problems and reduce the high burden of TB, Indonesian government implemented the Directly Observed

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Therapy, Short-Course (DOTS) strategy recommended by The World Health Organization (WHO) since 1995[6] which emphasizes passive case finding[7]. This program successfully applied in 100% Puskesmas as primary health care in Indonesia, but some challenges remain[6]. Furthermore, the ministry of health in 2016 has targeted to eliminate TB nationwide in 2035 and its elimination in 2050. The definition of TB elimination is if only 1 per 1,000,000 population suffers from TB[1]. Effective implementation of DOTS strategies are needed to obtain the target and resolve the matters. One of the government targets is increasing tuberculosis case detection rate (CDR). The reason on why the TB CDR is still low might be due to lack of awareness aggravated by only 20% of patients received diagnostic capacity at the health center where they first sought care[2, 8]. The lack of awareness delays the patients from visiting TB health center[9].

In Indonesia as well as another developing country in South East Asia, TB patients are known to avoid or seek late care, due to the misconception of famous TB etiologies such as sharing utensils, hereditary transmission and smoking[10, 11]. This data supports that the lack of awareness is still a problem. Furthermore, low TB awareness level leads to lack of health-care-seeking behavior[4, 12]. It will contribute to the unfortunate outcome of the DOTS program, which depends significantly on passive case finding[7]. Several factors affecting community awareness and DOTS program outcome inspected by many research across different regions and populations in Indonesia. The factors that were reported to have a significant correlation with the success of DOTS program, especially in new case finding a program by increasing the community awareness, our knowledge and perception[13-15]. Understanding patient knowledge and perception as precursor aspects in effective TB control is the vital step to help shed more clarity on the reason why case detection and diagnosis may be inadequate[4,6]. This concept needs to be understood, but unfortunately, certain factors that affect both of those aspects are rarely discussed and remain neglected.

Occupational status is a factor which may have an impact on patient knowledge and perception. The previous study reported that different occupation has a different level of experience and understanding[16]. Knowing the correlation between occupational status and patient knowledge and perception is necessary but has not been much researched yet in Indonesia. Another factor that affects patient knowledge and perception is the educational stage. The tutorial stage is well-known as a factor affecting patient awareness and understanding[17], but few studies explain its effect on patient perception, especially in Indonesia.

It is possible that the occupational status and patient knowledge involved as valuable factors affecting patient expertise and perception. Without understanding their correlation, the reason why case detection and diagnosis in DOTS may be inadequate in Indonesia remain obscure. Therefore, this study aims to identify the level of knowledge and perception regarding tuberculosis and their relationship with occupational status and educational stage and to provide information for government along with health workers to enhance effective DOTS programs in Indonesia.

Method

Setting: This study organized in TB outpatients' clinic from 1 private hospital and 2 government TB health care centers (Siti Khodijah Hospital Sidoarjo, Medaeng Community Health Center, and Taman Community Health Center) in Sidoarjo city. The TB outpatients' clinic were selected based upon caseload and their willingness to participate in the study. They cover more than 50 % TB patients for each center, represent both types of the TB care center in Indonesia, and reflect the socio-demographic characteristics of Sidoarjo TB patients.

Design: An observational analytic study with the cross-sectional design conducted. A total of 51 pulmonary TB outpatients were collected.

Study Population: The subjects were collected using total sampling. The study included all new case TB patients (pulmonary or extra-pulmonary TB) aged 15 years or older who were diagnosed with active tuberculosis on treatment, defined according to The Ministry of Health Indonesia[3] and had started the TB treatment category one according to national guidelines[3]. Patients who refused to take part in the survey or having communication problem were excluded. The sample size was calculated, taking into account the prevalence of TB treatment category 1 with an alpha error of 5% and power of 80%.

Study conduct and data collection: All TB patients from September 2018 until February 2019 (6 months in line with category 1 TB treatment program)

diagnosed in the TB health care center were selected for the study. Data were collected by research assistants and nurses using an anonymous questionnaire. The research assistants were final year medical students. The nurses were staff members of the TB health care center and were responsible for actively searching for cases and controls to collect the data. An Indonesia version of the questionnaire was developed from the previously validated questionnaire[18, 19] and pre-tested by Faculty of Medicine Universitas Muhammadiyah Surabaya, Indonesia. Adjustments were made after assembling a focus group discussion of all health worker participating in the study with expert advice from a Pulmonologist.

Data on the knowledge of the cause, prevention, and transmission of TB and the perception of TB treatment was collected. The questionnaire was divided into two main sections: (1) Knowledge; and (2) The perception of TB.

The questionnaire was designed to collect comprehensive information and filled individually, taking approximately 15 minutes to complete the questionnaire, accompanied by a research assistant personally to reduce bias. The questionnaire consisted of closed-ended questions. Items for knowledge contain a total of nine questions which include four domains: general knowledge; mode of transmission; causes; and prevention (table 1). Items for perception contain fourteen questions which consist of two domains; aversion to treatment and negative perception towards TB treatment as individual and in social life (table 1). Socio-demographic characteristics studied included gender, age, marital status, level of education, and occupational status. Data for the first time TB diagnosis were made and the duration of treatment already obtained were added to confirm inclusion criteria.

Data analysis: Descriptive analysis was used for patients' socio-demographic information, knowledge, and perception toward TB, and it consisted of frequency counts and percentages. Quantitative data were summarized as mean ± SD or 95% Confidence Interval. Qualitative data were summarized as percentages. A Statistical Package for Social Sciences (SPSS) version 25.0 (IBM Corporation, New York, USA) was used for the data entry and the data analysis. Parameters of patient knowledge and perception were classified as good or low based on average score. Coefficient Lambda analysis was used to evaluate the effect of occupational status on knowledge and perception level. Spearman analysis was used to appraise the correlation of last educational stage on knowledge and perception level. The level of statistical significance was defined as p value.

Ethical Consideration: The questionnaire was submitted for ethical review. The study was approved by the Regional Committee for Medical Research Ethics of Sidoarjo Regency and the Medical Research Ethics Committee, Universitas Muhammadiyah Surabaya. The purpose was explained in details to each patient agreeing to participate in the study, and oral informed consent was obtained before interviews. In this study, we strictly ensure the confidentiality of the study respondents.

Results

Respondents' Profile: The demographic and socio-economic statistical characteristics of this study are shown in Table 2. The total number of patients TB were 51 aged 21-72 years old with the characteristic of respondents based on age grouping are productive age groups (18-49 years), consists of male 29 (56.9%) and female 22 (43.1 %). The average age of the respondents was 43.39 years, and most respondents were 55 years old, with a standard deviation of 13.6. Most of the respondents had been married 42 (82.4%). The result found that one-third of patients were unemployed (37.3%). The major educational stage was senior high school as many 32 (62.7%) of TB patients and the other was 9 (17.6 %) junior high school, 7 (13.7%) elementary school, 2 (3.9%) diploma and degree, and 1 (2 %) no formal education.

Respondents′ knowledge and perception regarding TB (general knowledge, mode of transmission, causes, and prevention): The level of knowledge and perception regarding TB (general knowledge, mode of transmission, causes, and prevention) are shown in Table 3. Mean score was used to determine the level of knowledge. The data was categorized as good or low based on mean score. The data shows that the mean score of knowledge is 8, and the mean score of perception is 12. If the mean score of knowledge is more than 8, it is categorized as good knowledge or knowledgeable, and if the score is less than 8, it is categorized as low knowledge or lack of knowledge.

The same method was used to determine the level of perception. If the mean score of perception is more than 12, it is categorized as a good perception, and if the score is less than 12, it is categorized as low perception. This

study found that nearly two-fifths of the respondents could be concluded into lack of knowledge 19(17.6%), whereas a quarter of the respondents 10(19.6%) have a low level of perception.

Graphics-1 shows that the most incorrect answer chosen by the patient was questioned number 1, 3, and 4. Number 1 shown the agent of the disease. It can be concluded that many of the respondents did not know that the agent of the TB disease is bacteria. Number 3 and 4 shown the mode of transmission of TB. It can be assumed that the mode of transmission of TB disease still needs to be mentioned in the prevention of TB socialization.

A Spearman's rank-order correlation was run to determine the relationship between the last educational stage on knowledge and perception level. There is a strong, positive correlation between last educational stage on level of knowledge, which was statistically significant (rs = 0.569, p = 0.000) whereas no statistically significant correlation with level of perception (rs = 0.200, p = 0.159) (Table-4).

Coefficient Lambda analysis was used to evaluate the effect of occupational status on knowledge and perception level. The lambda value to determine the correlation between occupational status on knowledge level was 0.000, suggesting that there is no association, while lambda value to determine the relationship between occupational status on perception level was 0.421 (p = 0.025) suggesting that there is a good association between two variables (Table-4).

Table 1. Question items in Questionnaire

Knowledge	**Perseption**
The cause of TB is bacteria	TB is life threatening disease for me
TB is curable disease	TB is caused by a curse
TB is a contagious disease	I have made sin therefore I got TB
TB is an airborne disease	I am ashamed because I got TB
TB patient should dispose sputum in a close container	TB treatment is available at Puskesmas
Closing mouth while coughing to prevent transmission	TB patients must be isolated from the community
TB is easily spread in a crowded house	TB needs serious treatment
TB should be treated for at least 6 months	I have to follow the treatment routinely
TB is diagnosed by sputum examination	I can be cured if I treated at Puskesmas
	I am afraid if people gossiping me when I go to Puskesmas
	I am afraid that my disease interfered my social life
	I am afraid losing my job because of my disease

Table 2. Demographic and socio economic characteristics of TB patients (n = 51)

Characteristics		**N (%)**	**Mean (SD)**
Gender	Male	29(56.9)	
	Female	22(43.1)	
Age			43 (13.6)
Marital Status	Had been married	42(82.4)	
	Single	9(17.6)	
Occupational Status	Employed	32(62.7)	
	Unemployed	19(37.3)	
Educational Level	No formal education	1(2)	
	Elementary School	7(13.7)	
	Junior High School	9(17.6)	
	Senior High School	32(62.7)	
	Diploma, Degree or above	2(3.9)	

Table 3. Respondents′ knowledge and perception regarding TB (n = 51)

Characteristics	Mean Score	Category	N (%)
Respondents′ knowledge	8	Good	42(82.4)
		Low	9(17.6)
Respondents′ perception	12	Good	41(80.4)
		Low	10(19.6)

Table 4. Correlation between occupational status and educational stage on knowledge and perception level: precursor aspects in effective TB program

Characteristics		Level of knowledge	Level of perception
Educational stage	Spearman's rank-order correlation	r = 0.569, p = 0.000	r = 0.200, p = 0.159
Occupational status	Coefficient Lambda	p = 0.000	p = 0.421, p = 0.025

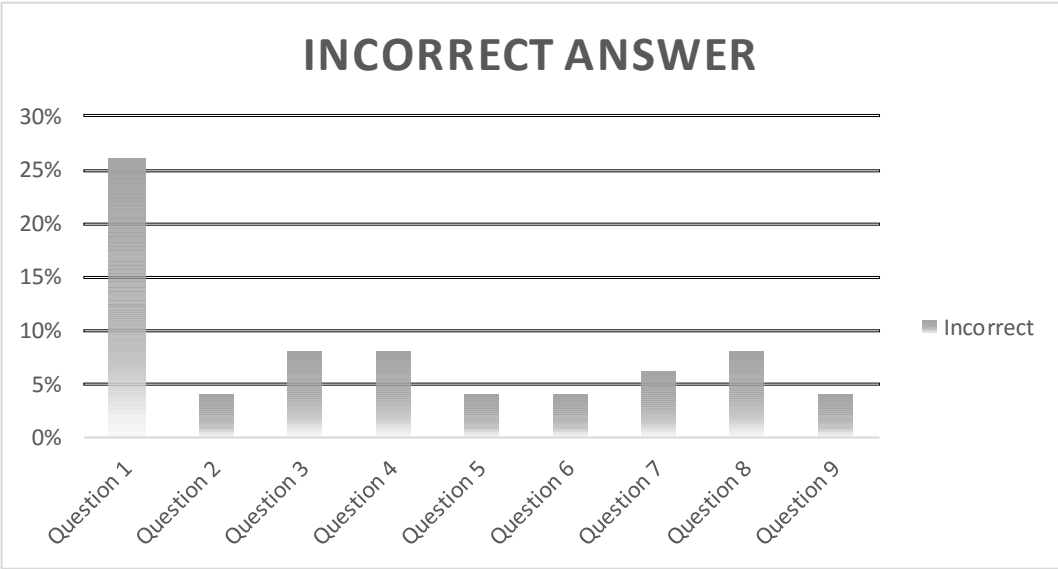

Figure 1. Incorrect answer for level of knowledge question

Discussion

The socio-demographic analysis found that men looks have more risk factor than women in TB infection. This result correlates with Gender differences in tuberculosis diagnosis, treatment and research outcomes in Victoria, Australia, 2002–2015 that found many TB patients in men compared to women[20], this fact might be due to women that may be reluctant to go for diagnosis because of fear of stigma in the event they are diagnosed with TB[21].

In this study, perceptions and knowledge about tuberculosis were low. Some of the main factors in TB knowledge and perception are identified. The prevalence of low TB knowledge is high in the general adult population, with a greater magnitude among men than among women. The high prevalence of low TB knowledge and perception in the general population may indicate that up-to-date information and health education about TB are inadequate and do not handle the target population correctly. This situation is also exacerbated by the fact that the majority of the population in Indonesia live in middle-low socio-economic status, with a high level of formal education or only basic education (senior high school degree), no formal employment or only private workers, with the lowest wealth index, which in turn is related to low TB knowledge.

Many studies have linked the condition regarding the level of education to knowledge and perception

of tuberculosis disease[22, 23]. Some studies also found an association between occupational status and TB disease[22]. The background behind the patient like educational level and occupational status will build an experienced life, which then accumulates into knowledge. Knowledge and its interaction with the values that develop in people's lives will forming patterns of behavior and attitudes of society, particularly to a stigmatized disease

However, there are also studies that reveal different things. Research in Sabah revealed there was no relationship between educational level and perception[23]. Other research on Khazakstan revealed the same thing[22]. Conclusions were obtained in that study, was no significant relationship between occupational status and patient's perception regarding tuberculosis. Both working and non-working patient have no pattern trends perception. This is because, in the concept of environmental health, work does not affect the formation of perceptions too much[24]. This result is in accordance with research conducted in Khazakstan; namely, no relationship was found between perceptions with the work and financial condition of the respondent[22].

It is proven that low community knowledge has an impact on the control of TB disease in an area. One of the causes of the lack of level of knowledge related to TB is the difference in people's background in a specific area. These backgrounds include age, race, gender, level of education, type of work, socio-economic, and sources of information. This is in accordance with Notoatmodjo's theory that the factors that influence a person's level of knowledge include age, level of education, employment, and socio-economic and sources of information[24].

Whereas in another country, the factors associated with knowledge regarding tuberculosis patients are the level of education, patients are feeling uncomfortable during supervision, and knowledge regarding the information of taking medication. Whereas age, sex, occupational status, and income level are not related to the variable[25].

The higher association of factors from occupational status with low TB knowledge in this study might be explained by that factor included a large number of housewives, and unemployed. These groups of people are also more likely to have less education, less access to information, and have less exposure to social interactions[26].

Findings regarding high misperceptions in tuberculosis are comparable with other similar studies conducted in Africa and Asia[27]. Understanding of tuberculosis perception is very important because it may be an indication of the late search for appropriate health and refusal to make appropriate treatment decisions and adherence to treatment. Misperceptions can also lead to stigma, which creates difficulties in involving the community in TB control programs[28]. Health education programs about TB need to address common misunderstandings in the community.

Poor people (low-income quintiles), or less occupational status, have a high prevalence of low comprehensive TB knowledge, and this is in line with research from India[27]. As evidenced by research from Manila[29], people with low income have a relationship with low health-seeking behavior. The low level of knowledge among the poor in our study exacerbates the level of low health seeking behavior among poor people[30]. Tuberculosis burden is high among poor people with poor living conditions, malnutrition, and exposure to other infectious diseases. This lack of knowledge about tuberculosis in the community will worsen the situation because they will not know how to protect themselves from illness when to seek health care, the need for care, and the importance of adherence to treatment for TB. As a result, this, in turn, will make it difficult to have an effective TB control program. Poor people need to be addressed in health education and information about TB and addressing the problems of the poor will contribute to the effectiveness of TB control programs.

Educational level is strongly associated with a comprehensive level of tuberculosis knowledge, and uneducated people and those who only have basic education have a high chance of low comprehensive knowledge. This finding is supported by other similar studies[31]. In the other hand, the government should not underestimate the program for higher education or knowledge regarding TB, because patients with greater knowledge about TB were also can be delayed in seeking a diagnosis of their TB status[32]. The explanation might be that educated people have more access to various sources of information and easily understand more complex messages. Increasing the level of education in the community will increase general knowledge about infection control, including tuberculosis and general public health. Analysis of secondary data used in this study can be influenced by unknown boundaries related

to data collection method and primary data sampling procedures.

Conclusion

The level of knowledge in some important curriculum of the TB disease, such as mode of transmission, still needed to be improved by a health worker who doing health education regarding TB as health promotion to prevent the transmission of the disease. Nearly a quarter of the respondents were lack of perception, proved that the community perception level in the working area is still relatively low and need to be improved. Data shows that occupational status is an essential factor for making health promotion to enhance the level of knowledge for TB patient and last educational stage is a valuable factor for increasing the level of perception of TB patient. Health workers should give more attention regarding health promotion to patients with unemployed status and low educational stage. If the level of knowledge and level of perception of TB patient increased, DOTS program including health promotion will achieve a better outcome because of the community more aware of TB. Therefore, the problem of TB patients which known to avoid or seek late care due to a misconception can be decreased or resolved.

Conflict of Interest: There is no conflict of interest to declare.

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Data Availability: The data set used and/or analyzed during the current study are available from corresponding author on reasonable request.

Ethics Statement: All procedures performed in studies involving human participants were in accordance with the ethical approval of Regional Committee for Medical Research Ethics of Sidoarjo Regency, Indonesia and the Medical Research Ethics Committee, Universitas Muhammadiyah, Surabaya, Indonesia.

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