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Predictor Factors of Tuberculosis Transmission Prevention in Surabaya, Indonesia

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ABSTRACT

This work aims to analyse the impact of pre-illness behaviour, knowledge, self-efficacy, family support and the environment on tuberculosis prevention behaviour in the context of Surabaya, Indonesia. This cross-sectional research comprises 176 respondents over 17 years of age, who were selected by simple random sampling. Data collection was carried out to assess behavioural data before illness, knowledge, self-efficacy, family and environmental support for tuberculosis transmission prevention behaviour. The data were used to determine the predictive factors that influenced the behaviour of the prevention of tuberculosis transmission by using multiple linear regression. The level of significance was set at P <0.05. The results of multiple linear regression demonstrated that family support, self-efficacy and behaviour before illness had more influence on tuberculosis transmission prevention behaviour. More specifically, Y = 20.314 + (0.359) X1 + 0.241X2 + 0.225X3 + 0.855X4 + 0.462X5, where Y = tuberculosis transmission prevention behaviour, 20.314 = coefficient value, X1 (0.359) = behaviour before illness, X2 (0.241) = knowledge, X3 (0.225) = self-efficacy, X4 (0.855) = family support and X5 (0.462) = environmental factor. The preventing tuberculosis transmission behaviour in Surabaya, Indonesia was more influenced by family support factors, self-efficacy, and pre-illness behaviour. Therefore, the standard for preventing tuberculosis transmission in the family was prioritized in reducing the spread of tuberculosis.

Keywords: Prevention, Tuberculosis, Illness Behaviour, Knowledge, Self-Efficacy, Family Support, Environment

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INTRODUCTION

Tuberculosis is a contagious disease which is among the top 10 causes of death worldwide. The tuberculosis transmission is a particular concern in both developed and developing countries, among them is in Indonesia, where the health problem of tuberculosis is a major challenge that remains unresolved.

The primary problem in the increase of Tuberculosis is the prevention behaviour, which is still not good. Therefore, the risk of transmission of Tuberculosis is very high, and the problem of Tuberculosis in Indonesia is getting more complex, with the emergence of MDR TB and HIV TB. According to research by Nurhayati et al. (2015), the prevention behaviour of TB transmission is still very low, and Tuberculosis prevention behaviour can be prevented by daily actions for patients [1-3].

Reported data shows the number of Tuberculosis cases in Indonesia in 2018, especially in East Java province, to be as many as 56,445 people, and in Surabaya, as many as 7,007 people [4-6]. These data indicate that Tuberculosis is still high. This problem arises because many new patients diagnosed with Tuberculosis do not know about the disease they suffer, nor about the transmission prevention behaviour of Tuberculosis sufferers. This behaviour is classified as bad, and almost 80% of sufferers do not cover their mouths and noses by using masks when they are outside the house[7-9].

This condition can be related to knowledge, Interpersonal Perceived Susceptibility, Perceived Severity, Perceive Benefits, Perceive Barriers, and Self-efficacy[3]. In other words, the prevention behaviour of Tuberculosis sufferers is influenced by behaviour before being exposed to Tuberculosis, the patient's perception of their susceptibility to Tuberculosis, perceptions of how serious the condition is, the consequences caused by Tuberculosis, the advantages and obstacles encountered in preventing tuberculosis transmission, and self-confidence to take steps to prevent transmission of Tuberculosis[10-13]. Therefore, it can be predicted that the transmission of tuberculosis can be caused by behavioural factors. Based on these reasons, the purpose of this research is to analyse predictive factors of tuberculosis transmission prevention in Surabaya.

METHOD

A cross section research analysed predictive factors of tuberculosis transmission prevention in Surabaya, Indonesia. Participants consisted of 176 respondents who were over 17 years of age. The sampling technique uses simple random sampling.

Data were collected between 1 February to 16 July 2020. Data were collected from participants who met the inclusion criteria, namely, participants with tuberculosis during treatment and had no complications from other diseases. Data were interviews and questionnaires that consisted of a behavioural questionnaire before getting illness with five questions. The indicators were smoking, drinking alcohol, exercise habits, clean and healthy living

habits, with a Cronbach's Alpha value = 0.807. A knowledge questionnaire with five questions that the indicators were understanding Tuberculosis, prevention of transmission and treatment of Tuberculosis, signs and symptoms of Tuberculosis, with a Cronbach's Alpha value = 0.69. The self-efficacy questionnaire comprised 12 questions, where the indicators were confidence in the illness, confidence in obtaining information, confidence in the treatment program, belief in overcoming treatment effects, confidence support from family, friends and health workers in carrying out treatment, confidence in carrying out routine checks during and after Tuberculosis treatment, with a Cronbach's Alpha value = 0.956. A family support questionnaire with five questions was also involved, where the indicators were support for treatment, support using masks, nutritious food support, with a Cronbach's Alpha value = 0.965. A questionnaire on environmental factors included seven questions, where the indicators were cigarette smoke, fire and dust, cleanliness of the home environment, state of ventilation and house lighting, with a Cronbach's Alpha value = 0.956. Moreover, a preventive behaviour questionnaire contained 15 questions, where the indicators were coughing and using masks, spitting or throwing sputum in place, drying mattresses and pillows under the hot sun, sleeping and using items separately, adherence to taking medication, maintaining health and cleanliness, ventilation of the house, and nutrition, with a Cronbach's Alpha value = 0.966.

This research had received approval from the Ethical Review Board (ERB) Committee in Muhammadiyah University, Surabaya (Surabaya, Indonesia; ERB No. 456/2020). The research participation consent form included a statement that participants can cancel their participation at any time. The collected data was used for the purpose of research, and participant anonymity can be protected. Participants gave their consent voluntarily after a thorough explanation.

Analysis of the data determined the predictive factors of tuberculosis transmission prevention in Surabaya by using multiple linear regression. The significance level was set at $P < 0.05$.

RESULT

Table 1 shows that respondents who had the highest number were aged between 26-44 years (36.9%), and the smallest number were aged between 17-25 years (10.8%). Male respondents were 61.5% of the total respondents. Respondents' education which has the highest number was high school education level (46.2%). The respondents who had a private job were 47.7% of the total. About 53.8% of the respondents engaged in treatment which was over 3 months.

Table 1. Distribution of respondents based on age, sex, education, occupation, duration of tuberculosis treatment in Surabaya, Indonesia (N = 176)

Characteristics of respondents	N	Percentage
Age		
Youth (17-25 years)	19	10.8
Young adults (26 - 44 years)	65	36.9
Middle adult (45 - 59 years)	46	26.2
Elderly (60-75 years)	46	26.2
Gender		
Male	108	61.5
Female	68	38.5
Education		
Did not finish / did not go to school	0	0
Elementary School	38	21.5
Junior high School	30	16.9
Senior High School	81	46.2
College	27	15.4
Occupation		
Does not work	33	18.5
Student	8	4.6
Private	84	47.7
Entrepreneur	29	16.7
Labour	5	3.1
Other	17	9.7
Duration of treatment		
<3 months	81	46.2
> 3 months	95	53.8

Table 2 shows the behaviour of respondents before getting illness, which was negative (67.7%), the respondent's knowledge of TB had sufficient knowledge (55.4%), the self-efficacy respondent of TB disease was positive (58.5%) for respondents, half of the respondents had good family support (53.8%), and sufficient environmental factors (50.8%). TB transmission prevention behaviour was a positive value (76.9%).

Table 2. Behaviour Factors for TB Transmission Prevention in Surabaya, Indonesia (N = 176)

Characteristics of respondents	N	Percentage
Behaviour before illness		
Positive	57	32.3
Negative	119	67.7
Knowledge		
Less	35	20
Enough	98	55.4
Good	43	24.6
Self-efficacy		
Positive	103	58.5
Negative	73	41.5
Family support		
Less	22	12.3
Sufficient	59	33.8
Good	95	53.8
Environmental factors		
Less	73	41.5
Enough	89	50.8
Good	14	7.7
Behaviour of TB transmission prevention		
Positive	135	76.9
Negative	41	23.1

Table 3 shows that there was an effect of behaviour before illness, self-efficacy, and family support on behaviour to prevent tuberculosis transmission in Surabaya, Indonesia. A linear regression test (p = 0.024) shows that behaviour before illness that had an effect on prevention behaviour, as well as self-efficacy (p = 0.026), but family support had a greater effect on tuberculosis infection prevention behaviour, because the coefficient value was greater. Therefore Y = 20.314 + (0.359) X1 + 0.241X2 + 0.225X3 + 0.855X4 + 0.462X5 + e, where Y = tuberculosis transmission prevention behaviour, 20.314 coefficient, X1 (0.359) = behaviour before illness, X2 (0.241) = knowledge, X3 (0.225) = self-efficacy, X4 (0.855) = family support, and X5 (0.462) = environmental factors.

Based on the summary table, the R value of 0.744 meant that the closeness of the relationship between the behavioural variables before illness, self-efficacy, and family support for the location with the behaviour variable to prevent tuberculosis transmission was very strong where R was the multiple value. correlation coefficient. If the value approaches -1 or 1, the relationship became stronger. As the value approaches 0 (zero), the relationship became weaker

Table 3. Factors that influence tuberculosis prevention behaviour in Surabaya, Indonesia (N = 176)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	20.314	3.207		6.335	.000
Behaviour before getting illness	.359	.155	.161	2.313	.024
Knowledge	.241	.168	.111	1.438	.156
Self-efficacy	.225	.098	.276	2.286	.026
Family support	.855	.218	.487	3.928	.000
Environmental factor	.462	.307	.100	1.501	.138
R=0.744, Adjusted R^2=0.722					

DISCUSSION

The results after multiple linear regression analysis tests show that the support factor was the strongest factor in carrying out Tuberculosis transmission prevention behaviour, with an increase in the effect of 85.5%. The results of the significant difference test show a p value of 0.000, which means that family support had a direct influence on the behaviour of the patient in preventing the transmission of tuberculosis. This was in line with research conducted by Devi et al. (2019), who stated that there is a direct relationship between family support and the behaviour of Tuberculosis patients in preventing the spread of MDM Tuberculosis at a health centre in Semarang [14]. This research was also in line with the research by Genakama (2019), who stated that there is a relationship between family support for pulmonary tuberculosis prevention behaviour, because a person gets good support from family about transmission prevention behaviour, so he will behave well[15].

Family support in the Health Promotion Model included the domain of interpersonal influence, which can effectively increase health behaviour that results in behaviour, beliefs and attitudes. According to Friedman, family support is an attitude, an act of family acceptance of

family members in the form of emotional support, information support, instrumental support and appreciation support[16]. This theory is in line with the results of this study. In this study, family action in providing support by always reminding the patient about taking medication, using masks, separating eating utensils, etc., and accompanying them for treatment, showed positive results.

Good family support can also encourage changes in the behaviour of good sufferers, as well as in taking steps to prevent Tuberculosis transmission. This is because people tend to manifest a behaviour if the people closest to them provide examples of such behaviour and provide assistance to manifest that particular behaviour. The role of the family in this case is the supervision of taking medication (PMO), because the family must encourage the patient to heal properly. Drug Drinking Supervisor (PMO) was the view and assessment of Tuberculosis sufferers on interactions with family in the form of information, attention, encouragement and assistance from the Drug Drinking Supervisor to bring up the quality of relationships that can affect patient recovery[17]. The results showed that the family provided support in reminding patients to take medicine, reminding them to use a mask when leaving the house, providing nutritious food, and taking patients for control to a community health centre. This was in line with Hutama's research, who mention that family support that can be done in the processes of preventing tuberculosis transmission were by reminding patients to use masks, providing private beds, becoming supervisors of taking medication, and not borrowing utensils and toiletries[18].

In addition to family support, behaviour before illness had an influence on behaviour to prevent tuberculosis transmission. The effect resulting from this pre-illness behaviour was indirect. Existing Tuberculosis patients had negative behaviour before illness (67.7%), which means that the behaviour of the respondent before being sick or before being diagnosed with Tuberculosis had a bad habit in his life pattern. However, according to the results of this research, it was found that the behaviour of TB transmission prevention carried out by respondents was positive or good (76.9%). This was in line with the theory of the Health Promotion Model, which states that previous behaviour that was bad in nature that influenced the future behaviour, and conversely, previous good behaviour may also have a good effect on future behaviour. Many respondents had smoking habits or were exposed to cigarette smoke, washing their hands without soap and drank alcohol, which were among the factors that caused tuberculosis. This was in line with the research by Horne et al. Individually, smoking behaviour and drinking alcohol behaviour can also influence the occurrence of tuberculosis[19, 20]. This research was in line with the research by Genakama, who said that the previous behaviour was related to the behaviour of Tuberculosis prevention of transmission, which indicated something was done before the illness had an impact at the time of healing[15]. Previous behaviour had a direct and indirect effect on subsequent behaviour. Previous behaviour can change according to the advantages or experiences that are owned. In addition, behaviour can change if there are guidelines for life or other factors. In this case, those who have negative behaviour before illness can change their behaviour to prevent Tuberculosis transmission from negative to positive.

Self-efficacy or self-belief also had an influence on the behaviour of preventing tuberculosis transmission, because self-efficacy is the ability to regulate and carry out healthy behaviour. A person's efficacy decision is known from the expected results, namely, a person's ability to complete a certain job where the expected results are favorable[21]. The results of the analysis show that the regression coefficient was quite weak in influencing the Tuberculosis transmission prevention behaviour, with an increase in the effect of 22.5%. However, self-efficacy had a direct effect on Tuberculosis transmission prevention behaviour, with a significance value of 0.049 <0.05 [15, 22].

The Health Promotion Model explains that the factors that influence self-efficacy included personal characteristics and past experiences. Self-efficacy is among the main concepts in the Health Promotion Model, which is awareness of one's ability to assess self-capabilities to organize health improvement behaviour. This awareness can affect a person's obstacles in carrying out a behaviour [21].

The average of tuberculosis patients had a positive self-efficacy of 58.5%. Since the sufferers want to recover from their illness and have high confidence in treatment, health services and complying with education or advice given by health workers. The more positive or higher a person's self-efficacy value, the higher or more positive the Tuberculosis transmission prevention behaviour that someone has. The results showed that it was reinforced in the research quote from Sugiarto et al., which stated that the process of self-efficacy was one of them from cognition or knowledge. In this case, the action performed by a person originated from his mind[23]. Then the thought provided the direction for action. If the higher the knowledge, the higher education and occupation that can contribute to the formation of high self-efficacy, and high self-efficacy cannot be separated from the influencing factors such as previous individual experiences, experiences of the same person, social and physiological persuasion and emotional factors. With the existence of good self-efficacy, it was hoped that it can motivate sufferers to carry out a behaviour to improve their health[24, 25].

CONCLUSION

This research involved determining the predictor factors for the effect of prevention of transmission of tuberculosis in Surabaya, Indonesia. The factors tested were behaviour before illness, knowledge, self-efficacy, family support and environmental factors. The results showed that behaviour before illness, self-efficacy and family support had the most influence on the prevention of tuberculosis transmission in the context of Surabaya, Indonesia. The results also compared knowledge and environmental factors. The results produced in this research are promising and merit further research to investigate the predictors of the spread of Tuberculosis.

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CONFLICT OF INTEREST

The authors have no conflicts of interests to declare.

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