Article

Factors influencing transmission of tuberculosis in Ngeu Nata culture among Ngada community in Kupang, East Nusa Tenggara, Indonesia: Cross sectional study

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Abstract

Background: Eating "sirih/Betel" (Ngeu Nata) as a culture in Ngada society can become one of the primary source of Tuberculosis (TB) transmission due to share leaves and betel liquid reservoirs together with other people. If one of the people who share leaves is a TB patient, it can transmit TB to other person. The purpose of this study was to identify the factors that influence TB transmission in Ngeu Nata culture using the health belief model approach.

Design and Methods: This study used cross-sectional, involving 110 respondents, selected by consecutive sampling. The respondents were Bajawa ethnicity, age 36-67, at least consume Betel one a day together with other person in Ngada district, East Nusa Tenggara.

Results: The results showed that most respondents had high transmission behavior in betel eating culture (51.8%). Factors related to TB transmission behavior: medical history of TB (p=0.028), knowledge about TB (p=0.038), the perceived of severity of TB (p=0.037); the perceived of benefits (p=0.039) and the perceived of barrier (p=0.038). The dominant factor was knowledge, (OR 2,365 (95% CI) 1,015-5,510).

Conclusions: Implication: nurses should include aspect of Ngeu Nata cultural in designing TB education for Bajawa ethnicity in order to prevent TB transmission in Ngada district, East Nusa Tenggara.

Introduction

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis, mainly affected lungs.[1] One-third of the world's population is estimated to have been infected with tuberculosis and every second there is one person in the world who is infected with the disease.[2] Globally, tuberculosis accounts for 2.5% of other diseases and ranks seventh out of 10 causes of death worldwide. In 2017 the largest number of new TB cases occurred in Southeast Asia and West Pacific region by 62% then followed by the African region by 25%.

Indonesia is one of eight countries in the world that accounts for two-thirds of new TB cases and ranks third as the country with the most TB cases after India and China.[3] East Nusa Tenggara is one of the provinces in Indonesia which ranks 6th as the province with the highest TB prevalence along with the provinces of Maluku, West Sulawesi, South Sulawesi, and Aceh with a prevalence value of 0.3% from all provinces in Indonesia.[4] Ngada Regency is one of the districts in East Nusa Tenggara province that has experienced a significant increase in pulmonary TB cases from 2017 to 2018. According to the East Nusa Tenggara Central Statistics Agency,[5] the number of TB cases in 2017 totaling 3670 cases increased to 6583 cases in 2018.

The transmission of TB increase rapidly through airborne transmission. Some risk factors that encourage tuberculosis transmission include Mycobacterium, environment, and population. Population factors are dominated by risk behavior, one of which is betel eating culture. Betel eating culture in Ngada district, where someone with tuberculosis shares betel leaves and tobacco to eat, both those that have been chewed and those that have not been chewed with healthy people and sprinkling betel liquid from the mouth of TB patients. Betel liquid, with saliva, splashes occur during eating Betel, and they spit betel in any place, use a betel saliva shelter together, and sit eating betel in groups. This relates to saliva containing Mycobacterium. Saliva and dental plaque in TB patients are known to contain *Mycobacterium tuberculosis.*[6,7] Besides, according to Singh, Natto,[8] spitting up excess saliva mixtures can increase TB transmission and pathogens from one person to another through the splashing of droplet nuclei floating in the air Nuclei droplets containing Mycobacterium will survive in the air within minutes or hours when in a humid environment and not exposed to sunlight, thus contributing to transmit tuberculosis.[9-11]

This study used the Health Belief Model (HBM), to evaluate contributing factor of TB transmission in Ngeu Nata Culture among Ngada community in Kupang. HBM is chosen because this theory can help researchers to explore more detail about the belief, perceive, benefit and prevention about TB transmission in Kupang. The concept of HBM is based on one's belief in healthy behavior in which beliefs are believed to shape and change one's

Significance for public health

Tuberculosis (TB) is still a case that continues to increase from year to year in the world. The key to preventing the spread of tuberculosis in society is the community itself, especially TB patients. The culture of Ngeu Nata in society carried out by of tuberculosis patients has the risk of transmitting tuberculosis. It is very difficult to prohibit TB patients from practicing the culture of Ngeu Nata, because Ngeu Nata is a culture that has been integrated with society for a long time. Therefore, it requires educational action from nurses to increase public knowledge about the dangers of tuberculosis and its spread. A nurse educator is needed to create an innovation that can prevent TB transmission but without having to eliminate the culture of Ngeu by involving traditional leaders and religious leaders to encourage the community to obey in preventing TB transmission in the culture of Ngeu Nata.

behavior and can influence someone to determine actions that are good or not for themselves or those closest to them.[12] HBM has interacting components to predict health behavior. A health behavior can be predicted if there are individual perceived and premature factors.[13] The purpose of this study was to identify the factors that influence tuberculosis transmission behavior and the description of transmission behavior in Ngeu Nata culture in TB patients using the health belief model approach in the Ngada district.

Design and Methods

This study was cross sectional design, conducted in Ngada Regency, East Nusa Tenggara Province, Indonesia. The respondents were 110 who participate in this study. The inclusion criteria were: Bajawa ethnicity, adult with aged minimum 18 years, consume Betel at least once a day, in group, in Ngada district, East Nusa Tenggara. The study was conducted from June to July 2019. Ethics approval was obtained from the Ethics Committee of the Faculty of Nursing, Universitas Indonesia, Depok, Indonesia (No. 177 / UN2.F12 D1.2.1 /

Etik.FIK. / 2019), and approval from East Nusa Tenggara, the Investment Office and One-Stop Integrated Services, Bajawa (No.55 / DPMPTSP / 05/2019).The data was collected by a questionnaire on the characteristics of the respondents, the level of knowledge about tuberculosis, and the theory of the health belief model that was developed about TB transmission in relation to the culture of eating betel. The TB knowledge questionnaire was adopted from the WHO KAP and then modified by the researcher. The presentation of data uses proportions and percentages for univariate data. Bivariate analysis was performed using chi-square and multivariate analysis using logistic regression.[14] Data analysis was performed using SPSS.

Result

Characteristics of respondents

The majority of respondents are in the age range of 56-65 years and male. Most of the respondents had a primary school education,

Table 1. Characteristics of respondents and result of study (n=110).

Variable	Categories	Respondents	
		f	%
Age	Late adulthood (36-45 years)	38	34.5
	Early elderly (46-55 years)	17	15.4
	Late elderly (56-65 years)	39	35.5
	Elderly (>65 years)	16	14.5
	Total	110	100
Gender	Male	63	57.3
	Female	47	42.7
	Total	110	100
Education	No school	21	20
	Graduated from elementary school	44	40
	Graduated from high school	24	20.9
	Graduated from college	21	19.1
	Total	110	100
Occupation	Not working/housewife	17	12.7
	Farmers	59	53.6
	Private	32	29.1
	Retired	2	1.8
	Total	110	100
Treatment history	New (<6 months) and currently undergoing treatment	75	68.2
	Dropping out of medication and being treated	35	31.2
	Total	110	100
Knowledge	Bad	70	63.6
	Good	40	36.4
	Total	110	100
Perceived susceptibility	Negative	57	51.8
	Positive	53	48.2
	Total	110	100
Perceived severity	Negative	58	52.7
	Positive	52	47.3
	Total	110	100
Perceived benefits	Negative	62	56.3
	Positive	48	46.3
	Total	110	100
Perceived barrier	Negative	43	39.1
	Positive	67	60.9
	Total	110	100
Transmission behavior	High	57	51.8
	Low	53	48.2
	Total	110	100

worked as farmers, had just been diagnosed and were being treated. Furthermore, more than a portion of respondents have poor knowledge about TB, have a negative perceived of susceptibility to TB risk, have a negative severity perceived of the severity of TB, have a negative perceived of the benefits of actions to reduce TB transmission behavior and have a positive perceived of barrier to the presence of barriers to taking action to reduce the risk or severity of TB. The results of research on TB transmission behavior in the betel eating culture found that more than half of respondents behaved highly in the betel eating culture. The characteristics of respondents can be seen in Table 1.

Factors associated with TB transmission behavior in Ngeu Nata culture

Using HBM approach, there are several aspects were evaluated in this study: age, gender, education, occupation, treatment history, knowledge of tuberculosis transmission, perceived severity, perceived benefit, and perceived barrier (Table 2). The results of bivariate analysis showed a significant relationship between previous history of tuberculosis treatment with betel eating behavior (p=0.028, 95% CI). The results of the analysis also showed that a significant relationship between knowledge and tuberculosis transmission in betel eating culture (p=0.0381, 95% CI). Furthermore, tuberculosis transmission also had a significant relationship with perceived seriousness, perceived benefits and perceived barriers (p<0.05). However, there was not a significant correlation between tuberculosis transmission with age, gender, occupation, education, and perceived susceptibility (p>0.05). Based on the results of the analysis of the logistic regression method, knowledge about tuberculosis transmission was the most dominant factor influencing TB transmission behavior in the Nata Ngeu culture.

Discussion

TB transmission can be influenced by several factors. The results in this study showed that the majority of patients with active TB of betel chewing had TB transmission in a high betel eating culture of 57 respondents (51.8%). Also, respondents with a history of dropping out of medication have higher transmission behaviors than newly diagnosed respondents. This is likely due to lack of adherence due to the length of treatment and feelings of despair. This is consistent with research from Tarutani et al.[15] who found that a person with a long and repeated treatment was in a bad phase and it was very difficult to remain obedient in the treatment given. One that aggravates the patient's condition is the side effects of the treatment itself on the patient. This statement is supported by research by Wulandari,[16] who found that TB patients with mild side effects had adherence to treatment or taking medication as much as 22.3 times more than patients who had severe side effects. In line with the results of research Méda et al.[17] who found that a history of previous TB treatment and drug withdrawal strongly influenced patients to adhere to subsequent treatment.

The bivariate test results between knowledge and tuberculosis

transmission in this study can be seen that patients with poor TB knowledge tend to have high transmission behavior compared with good knowledge. It can be analyzed that the more knowledge a person has can lead to awareness which will eventually behave by the knowledge possessed.[18,19] Knowledge increases accuracy in seeing simple behavioral changes that occur right before one's eyes. Knowledge helps enrich someone to shape behavior.[20] In line with research Huddart et al. found a significant relationship between knowledge and TB prevention behavior in India.[21] The results of this study were also supported by Yermi et al.[22] who found a strong relationship between knowledge and prevention behavior in among TB patients Maros Indonesia.

In this study, TB patients with negative perceptions of severity had high transmission of tuberculosis in the betel eating culture. One may not believe that TB is medically not a serious problem but may believe that the incident will be serious if it creates important psychological and economic tension in the family.[23] In line with the study of Li et al.[24] who found a significant relationship between the perceived of severity with TB transmission prevention behavior and health care seeking. Immigrant workers who have negative severity perceived tend not to have the desire to prevent TB and seek health care. Furthermore, the perceived benefit is known to patients who have negative perceived of tuberculosis transmission in a high betel eating culture. This condition is probably due to the trust of the Ngada district community about the benefits of betel eating since ancient times is felt to be stronger than the benefits of reducing TB transmission behavior. This makes respondents' perceived about the benefits of taking action to reduce negative or low transmission. In line with the research of Yamson et al. who discovered the Filipino community considers betel chewing as a physiological satisfaction, treatment, and also as a provision for spirits that lead to eternity.[25] This research was supported by Sharan et al. and Winstock who discovered the benefits of eating betel for the community included providing a sense of comfort and euphoria.[26,27] The perceived of barriers was also related with TB transmission in betel eating culture. TB patients who have the perception that there are obstacles that can influence them to behave to reduce the seriousness or threat, have a high transmission behavior. Supporting studies include Tola et al. who found a strong relationship between adherence behavior in TB treatment with perceived barriers.[28] Another supporting study is Abolfotouh et al.[29] who found a significant relationship between perceived of barrier and early breast examination in women in Saudi Arabia. This is in line with the research of Zhao et al. who found perceived of barrier influence condom use in people with HIV in China.[30] About betel eating, barriers that are difficult to change are cultural factors. Eating betel has become a part of community life and is a legacy that has been passed down for generations and has always been associated with various ceremonial customs. This is supported by Pratt which found the meaning of betel eating in culture as a symbol of unity between men and women, social acceptance, and as a form of respect for guests or ancestors in ceremonial customs and other cultural ceremonies.[31]

TB patients in Ngada district have high risk behavior in TB

Table 2. Factors related that relate with TB transmission in Ngeu Nata culture.

Variable	Age	Gender	Education	work	Treatment story	Knowledge	Perceived susceptibility	Perceived severity	Perceived benefits	Perceived barrier
TB transmission (p)	**0.767	**0.474	**0.385	**0.934	*0.028	*0.038	**0.130	*0.037	*0.039	*0.038

*P<0.05; **P<0.05.

transmission, related with culture of eating betel. Factors influencing tuberculosis transmission in betel eating culture in TB patients are history of treatment, knowledge of tuberculosis, perceived seriousness, perceived benefits and perceived barriers. The most dominant factor is knowledge about tuberculosis.

From the finding, it is recommended to provide health education about TB transmission for Bajawi ethnic, and also including Ngeu Ngata culture, as part of the education material. It is also recommended to involving *Mosalaki* (traditional leaders) in education program with people in ethnic Ngada to facilitate communication between health workers and the community in providing education.

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