ORIGINAL ARTICLE

Knowledge and Attitudes Towards Tuberculosis Among the People Living in Kudat District, Sabah

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Summary

A multistage random sampling method was used to select the community sample in the district of Kudat, Sabah. A total of 205 respondents from 210 selected houses were interviewed using a standardised questionnaire to ascertain their knowledge and attitude towards tuberculosis. Generally the knowledge about tuberculosis was poor. The well known symptoms that the respondents knew were coughing blood (46.2%), cough (37.1%), loss of weight (34.5%), and loss of appetite (32.0%). Only 51% thought that the disease was caused by germs and it was transmitted by air. TB sufferers were thought to be dirty (22%) and the majority (51%) were not keen to mix with TB patients. Although more than 90% of the respondents considered TB as socially acceptable within their family and community, a large proportion (41%) expressed that getting TB was embarrassing, 4% said it was a disgrace to the family, and 16% said that it was too sensitive to discuss about it. These behaviours suggest that at the private level, the respondents were still perceived negative social attitudes towards tuberculosis.

Key Words: Tuberculosis, Knowledge, Attitudes, Kudat

Introduction

Tuberculosis still remains a major public health problem in Sabah. It has been estimated that approximately 4 per 1000 population in Sabah suffer from active infectious tuberculosis based on the last prevalence survey done in Peninsula Malaysia in1970[1,2]. More than 3,000 cases of tuberculosis were reported in Sabah each year (Table I). In spite of the improvement in the health care infrastructure, facilities and trained health personnel in Sabah, the majority of cases came for treatment only after the disease was well advanced (Table II). The finding from various studies indicate that patient delayed may be influenced by several factors, namely lack of knowledge, lack of awareness of the significance of symptoms, negative social attitudes or different combinations of these three factors. The objective of this study was to measure the knowledge and attitudes towards tuberculosis among the people living in this region.

Materials and Methods

Study design and questionnaire

This is a descriptive cross sectional study carried out in Kudat district from 9 December 1996 to 24 December 1996. The questionnaire was designed after literature review and preliminary discussions with the supervisor. The questionnaire was designed to capture the demographic characteristics of the respondents (age, sex, ethnicity, marital status, education level, and employment status), knowledge and attitudes of the respondents with regards to tuberculosis formed the major part of the questionnaire. The number of correct responses to the question on TB symptoms was scored i.e. final score was given for knowledge on symptoms based on the total number of correct responses to the question on TB symptoms[3]. Similarly scoring was done for general knowledge on TB (causation, transmission, prevention, and diagnosis). Three points were given if the respondent knew that tuberculosis was caused by

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germ, spread by air and could be prevented by BCG immunisation. A total of three points were given if the respondent mentioned X-ray, sputum and blood investigation for diagnosis of tuberculosis[3]. Here, the possible scores ranged between 0 to 6.

Pre-testing of questionnaire
Pre-testing was carried out in Kuala Lumpur on fifteen respondents by the author. The aim was to rule out ambiguity and to establish clarify of the questions. A few modifications was made after the pre-testing and the questionnaire was finally sent for printing

The training of interviewers
One day training section was organised by the author to brief the two public health assistants about the research and interviewing technique needed for this study and the questionnaire was used during this training section.

Exclusion criteria
The following households were excluded from the study if respondents had a past history of tuberculosis or aged below 19 years.

Selection of sample
A multistage random sampling method was used to select the community samples. District of Kudat is divided into six operational areas namely Sikuati, Lotong, Kudat, Matunggong, Tinangol, and Banggi island. The population of each operation area ranges from eight thousand to twelve thousand people. Two out of five operation areas were selected using simple random sampling methods. Banggi was excluded from selection because of unavoidable problems such as the transportation and the bad weather during the survey period. The two randomly selected areas were Sikuati and Tinangol. Each of the village in these two areas have a simple map that helped to identify the location of each houses, and all houses have a code number arranged in order. Tinangol has total of 24 villages (each village has 25 to 120 houses), out of these, 9 villages were selected using simple random sampling methods. These 9 villages have a total of 435 houses, of which 105 houses were selected for the study by using systematic random sampling methods (every fourth code number of the house). Sikuati has a total of 30 villages (each village has 30 to 130 houses) and 10 villages were selected using simple random sampling methods. These 10 villages consisted of 430 houses, of which 105 houses were selected for the study using systematic random sampling methods as in Tinangol i.e. every fourth number. Eventually a total of 210 houses were selected randomly for the study in the mainland of Kudat, 105 houses each from Tinangol and Sikuati.

Data Collection
Two public health assistants from the vector-borne disease unit carried out the fieldwork. They were selected because they knew the local dialect and are familiar with the areas where the research was to be conducted. The two assistants approximately covered 20 houses daily interviewing the head of household selected for the study, if the head of household is not available, the wives, parents or children above 19 years were interviewed according to the order. At the end of the day, the interviewers checked the questionnaire for completeness of information and it was re-checked by the author himself. Due to limited time factor the author decided the maximum of two visits made to the selected houses, after which it was excluded from the study.

Data processing
The questionnaire was coded and the data was entered into computer using the Dbase 4+ programme. The data was checked and then analysed using Statistical Programme SPSS and Epi-info. Statistical comparisons of the different groups were carried out using the χ^2 test, Student's *t*-test and F-test for analysis of variance (ANOVA). All *p*-values are two tailed and the significance level α=0.05

Results

Out of 210 household selected randomly, 205 households were interviewed i.e. 101 from Sikuati and 104 from Tinangol, giving a total of 205 respondents. Five (2.4%) household was not included because the respondents were not available during the study period inspite of two repeated visits made.

Sociodemographic Characteristics of respondents
Of the 205 respondents interviewed, 104 were males and 101 were females, the ratio of male to female was 1.03:1. The respondents age ranged between 19 and 72 years (Mean age was 36.1, SD 9.8) and the majority (79.5%) of the respondents were aged between 24 and 48 years. The majority (82%) of the respondents were Rungus. 31.7%(65) of the respondents had no formal education, 38.5% had primary education and 29.8% had secondary education. 33.7% of the males and 29.7% of

the females had no formal education. Out of the total of 120 respondents those aged below 39 years, 42.5% had primary education, 48.3% had secondary education and 9.2% had no formal education. Whereas among the respondents aged 39 years and above, most of them had no formal education (63.5%) or only had primary education (32.9%). The majority of respondents (88%) were married, 3 respondents were widows and 21 were single. The majority of the respondents were housewives (37.6%) and farmers (38.5%). Only 108 (52.7%) out of the 205 respondents had a personal income. Ninety-two respondents (44.9%) had income below RM500 per month and 42 respondents (20.5%) had income below RM200.

Knowledge about tuberculosis

Of the 205 respondents, 197 respondents (96%) knew about tuberculosis. Eight respondents had no idea about it. The majority of respondents obtained information about tuberculosis from health workers (50%), friends (25%), health talks (15%), and family members (10%). Twenty-six respondents (13%) had family members who suffered from tuberculosis before.

Of the respondents who knew about tuberculosis, the majority (91.7%) thought that the disease was infectious, 8 respondents believed that it was not so and one respondents did not know anything about it. A total of 122 respondents (61.9%) knew the part of body that tuberculosis affects, 86 respondents mentioned only the lungs and 36 respondents mentioned the lungs and other organs. Sixty-eight respondents (34.4%) had no idea which part of the body was affected. Some of the well known symptoms that the respondents knew were coughing blood (haemoptysis) (46.2%), cough (37.1%), loss of weight (34.5%), and loss of appetite (32.0%). Other mentioned symptoms were breathlessness, chest pain and fever. 14.7% of the respondents were ignorant of symptoms of tuberculosis (Table III).

The mean score on knowledge of symptoms was 1.66, SD 1.04. The score ranged from 0 to 4. There was no significant association between score on knowledge of symptoms and age groups (p=0.14), gender (p=0.6), ethnic groups (p=0.7) and education levels (p=0.3). There were also no significant differences on knowledge of symptoms between respondents with family member who suffered from tuberculosis previously and those respondents where family members did not suffered from tuberculosis before (p=0.6).

Table IV shows the respondents knowledge on causation transmission, prevention, and diagnosis of tuberculosis 50.8% of respondents thought that tuberculosis were caused by germ, 34% of the respondents did not know the cause, 8.6% believed that it was caused by smoking, 3% thought it was inherited and 3.6% thought that it was due to bad food. Seventy-five respondents (38.1%) knew that tuberculosis was transmitted by air, 69 respondents (35%) thought that it was transmitted by infected articles (e.g. foods, drinks, spoons, plates and cups) and 31.0% of respondents did not know the method of transmission. 31.5% of the respondents said that TB could be prevented by BCG, 11.7% said TB could be prevented by keeping house and environment clean, 13.2% said that it could be prevented by eating nutritious food and 76 respondents did not know how to prevent TB. The majority of the respondents mentioned sputum examination (61.9%) or x-ray (24.9%) was relevant for diagnosis.

The mean score for general tuberculosis knowledge (cause, transmission, prevention, and diagnosis) was 2.13 and SD=1.17. The score ranged from 1 to 5. The mean score for those aged 19-33 years was 2.3, those aged 34-48 years was 2.1 and those 49 years and above was 1.3. The differences were statistically significant ($p<0.01$). There was no significant difference between males and females with regards to general TB knowledge (p=0.06). The mean score for respondents with no formal education was 1.6, primary school 2.2 and secondary school 2.6. The differences were statistically significant ($p<0.0001$). There was no significant difference between the respondents with or without family member suffering from tuberculosis on general tuberculosis knowledge ((p=0.08).

When respondents were asked specifically whether they heard about BCG immunisation, 82% of them replied that they had heard about it, 62% knew the purpose of BCG immunisation, and 68% of the respondents knew that BCG immunisation is given at birth or soon after. The proportion who knew the purpose of BCG were significantly higher in those aged <39 years (72%) compared to those aged ≥39 years (49%) ($p<0.005$), in females (73%) compared to males (52%) ($p<0.005$), and in those with higher educational level compared to those with lower or no education i.e. 42% for those with no formal education knew the purpose of BCG, 66% for those with primary education, and 77% for those with secondary education ($p<0.0005$). The respondents who knew BCG

immunisation was given at birth or soon after was also higher in females (83%) compared to males (55%) ($p<0.0001$) and in those aged <39 years (76%) compared to those aged ≥39 years ($p<0.05$). 50% for those with no formal education, 74% for those with primary education and 80% for those with secondary education knew that immunisation was given at birth or soon after ($p<0.001$). No association was found between the knowledge of BCG and ethnicity and whether they had or had no family members who had suffered from tuberculosis.

A total of 177 respondents (90%) knew that tuberculosis can be treated by western medicine. 170 respondents (86%) said that it can be completely cured if the treatment was completed. Only 3 respondents said that tuberculosis was incurable. The duration of the treatment for tuberculosis mentioned by the respondents ranged from 1 to 12 months. However, only 33% (65 respondents) of the respondents knew the correct duration for the treatment of tuberculosis. Ninety-one respondents (46.2%) thought it was 3 months or less and 22 respondents (11.2%) did not know the duration. There was no significant difference between age groups ($p=0.7$), males and females (0.6), educational status ($p=0.08$) and ethnic groups ($p=0.1$) on mentioning the correct duration of TB treatment.

Attitudes towards tuberculosis

Only 59% of the respondents believed that tuberculosis could infect anybody (Table V). Twenty-two percent (22%) of the respondents believed that tuberculosis sufferers were dirty. 36% of the younger age group (19-33 years) believed that TB sufferers were dirty when compared to 16% in age group 34-48 years and 20% in age group ≥ 49 years. The differences were statistically significant ($p<0.05$). No differences between males and females ($p=0.2$), educational status (0.99), ethnic groups ($p=0.2$) with regards to believe that tuberculosis sufferers were dirty.

Only minority of respondents thought that they and their family were at high risk of getting infected with TB. Considerable large proportion of the respondents believed that they (22.8%) or their family (21.8%) will never get infected with tuberculosis. The majority of the respondents were not sure of the risk.

According to many of the respondents, TB was seldom mentioned in day to day conversation. Thirty-one percent (31%) of the respondents replied that tuberculosis was never mentioned in their daily conversation with 16.2% giving the reason that it was embarrassing or sensitive to talk about it.

The majority of the respondents considered tuberculosis as socially acceptable among their family members (96%) and the community (93%). Those who considered tuberculosis as not socially acceptable expressed fear of getting the disease from the sufferers. The majority of the respondents (56%) replied that they would be worried and sad if they were diagnosed positive for TB. Forty-one percent (41%) of the respondents expressed that they would feel embarrassed if they were diagnosed positive for TB and 4% said that it was a disgrace to their family. 53% for those with no education would feel embarrass if there were diagnosed as TB when compared to 44% for those with primary education and 26% for those with secondary education. The differences were statistically significant ($p<0.05$). The non-Rungus (59%) also attached more to this feeling compared to the Rungus (37%) ($p<0.01$). There was no significant difference between males and females ($p=0.9$) and age groups ($p=0.06$) on such feelings.

Fifty-one percent (51%) of respondents thought that tuberculosis patients should not socially mix as the disease could be transmitted to others. No association was found between this perception and age groups ($p=0.8$), gender ($p=0.9$), educational status ($p=0.7$) and ethnic groups ($p=0.9$). Forty-eight percent (48%) of the respondents said that the patients could mix around with the members of the community, 25.9% said that they could mix around only once they have started treatment as the disease would not be infectious anymore.

98% of respondents said that they would consult a doctor immediately, if they suspected they or their family members had contracted TB. 98% also expressed that they would like to know more about tuberculosis. 60% said that the information could be obtained from health centre or clinics and 34% said they could obtain information from attending health talks.

Table I: Tuberculosis incidence and mortality rate, 1991-1995, Sabah

Year	Total of new cases	Incidence rate	Total of deaths	Mortality rate
1991	3,141	202.1	94	6.0
1992	3,363	181.2	93	5.0
1993	3,696	187.9	110	5.6
1994	3,517	167.9	111	5.1
1995	3,540	163.3	90	4.2

Source: Annual Report 1995 Tuberculosis Control Programme Sabah.

Table II: The Extent of Pulmonary Tuberculosis according to Radiological Finding in Sabah 1992-1995

Year	Normal (%)	Minimal (%)	Moderate (%)	Advance (%)	Total (%)
1992	3%	27.9%	48.5%	20.6%	100%
1993	2.3%	30.0%	47.5%	20.2%	100%
1994	2.2%	31.1%	49.1%	17.6%	100%
1995	2.1%	30.4%	50.7%	16.8%	100%

Source: Annual Report 1995 Tuberculosis Control Programme Sabah.

Table III: Respondents knowledge about symptoms of TB

Symptoms	Number of responses	%
Haemoptysis	91	46.2%
Cough	73	37.1%
Loss of weight	68	34.5%
Loss of appetite	63	32.0%
Chest pain	20	10.2%
Breathlessness	10	5.1%
Fever	2	1.0%
don't know	29	14.7%

N=197

Table IV: Respondents knowledge on causation, transmission, prevention and diagnosis of Tuberculosis

Knowledge on	Respond	Number of responses	Percentage %
Causation	Don't know	67	34.0%
	Germs	100	50.8%
	Smoking	17	8.6%
	Inherited	6	3.0%
	Poor food	7	3.6%
Transmission	Don't know	61	31.0%
	Air	75	38.1%
	Infected articles	69	35.0%
Prevention	Don't know	76	38.6%
	BCG	62	31.5%
	Clean house/environment	23	11.7%
	Nutritious Food	26	13.2%
Diagnosis	Don't know	25	12.7%
	Sputum examination	122	61.9%
	X-ray	49	24.9%
	Blood examination	11	5.6%

N=197

Table V: Respondents views towards various questions on attitude towards TB

The survey asked				
TB affects mostly	old people	dirty people	anybody	don't know
Number	9	44	117	20
%	4.6	22.3	59.4	10.2
Do people here talk about TB?	yes	seldom	never	
Number	20	116	61	
%	10.2	58.9	30.9	
The chance of you getting TB is	high	low	never	don't know
Number	2	10	45	139
%	1.0	5.1	22.8	70.6
The chance of your family getting TB is	high	low	never	don't know
Number	3	8	43	141
%	1.5	4.1	21.8	71.6
To my family TB is	acceptable		not acceptable	don't know
Number	189		4	4
%	95.9		2.0	2.0
To the community here TB is	acceptable		not acceptable	don't know
Number	184		4	8
%	93.4		2.0	4.1
To me, getting TB is	embarrass		disgrace to family	worrying/sad
Number	81		7	110
%	41.1		3.6	55.8

N=197

Discussion

Social demographic characteristics

High rate of illiteracy and poverty are common findings amongst TB patients[3,4,5]. The social conditions which arise from poverty have long been known to provide a favourable environment for the tubercle bacillus[6]. A low standard of living, especially malnutrition, results in the lowering of individuals resistance to tuberculosis infection, while overcrowding at home facilitates spread of the disease from person to person. The lack of any formal education (31.7%) among the respondents creates particular difficulties for health education programmes. In addition, a high proportion of the respondents had low income below RM 200 per month. This will place a heavy financial burden to the family if any of their family members gets TB.

Knowledge and attitude about tuberculosis (TB)

Lack of awareness of TB symptoms is associated with delays in seeking professional treatment. In a study among Mexicans workers residing in Orange County, LA,[7] the average delay between the acknowledgement of tuberculosis symptoms and the presentation of the complaint to a physician was 8 months. All attributed the symptoms to the more benign condition like bronchitis or folk illness. These patients did not consider the possibility that tuberculosis was the cause. A study from Japan reported that only 10% of TB patients considered that they might have tuberculosis whereas over half thought that their symptoms were related to a cold[3]. In the present sample, only minority of respondents able to name haemoptysis (46.2%), cough (37.1%), loss of weight (34.5%), and loss of appetite (32.0%) as the symptoms of TB, which was similar to the findings of Geetakrishnan K. et al[8]. The finding suggested that in general, people with cough might not aware of the possibility that they might have serious disease unless or until their cough was accompanied by other symptoms, especially haemoptysis. This conclusion was reinforced by the findings from Hong Kong[9] which stated that among the newly diagnosed pulmonary tuberculosis patients who presented themselves at the clinic because, cough was the commonest symptom, 96% had cough at the time they first sought treatment from any source. However, only 15% of the patient originally sought treatment because of cough alone, 14% because of sputum, but 40% because of haemoptysis. These studies revealed that there is a need to educate the people with regards to persistent cough whether it is accompanied by other symptoms may indicate the presence of TB and should be investigated.

The awareness of TB symptoms amongst the respondents were generally low in this study which is similar to other studies[4,5,10]. In the present study, a considerably large proportion (14.7%) of the respondents did not know about any symptoms of TB, generally less than 50% of the respondents were able to mention a particular symptom of TB and an average, less than two TB symptoms was mentioned by each respondent.

Despite considerable evidence on the relationship between educational background and knowledge on TB symptoms,[10,11] no significant association was found in the present study to support this. Those with no formal education were found to have similar knowledge with regards to symptoms of tuberculosis when compared to those with primary or secondary school education. This study agrees to a similar finding by Westaway M.S[3].

The overall general knowledge on TB (cause, transmission, prevention and diagnosis) appears to be poor. Only 38.8% respondents knew that TB was transmitted by air and this was much lower when compared to 68% in a study by Westaway M.S[10].

The respondents with secondary education had significantly higher score on general knowledge on TB. This showed education was an important determinant of general knowledge on TB in the study carried out by the author and is supported by other studies (e.g. Kim et al.1985[11] and Westaway M.S. 1989[10]).

Low literacy level have been regarded as a major factor in lack of knowledge of BCG vaccination (Roy R.N. 1985)[5]. When asked specifically whether they knew the purpose of BCG immunisation, 62.5% of the respondents stated that BCG is given to prevent TB. The knowledge on BCG immunisation was found to be associated with education levels Respondents with higher educational status had better knowledge on BCG. Female respondents were also found to have a significantly higher knowledge on BCG immunisation among the present study group. This was not unexpected as the majority of them were housewives responsible for the care of their children and family members. This exposed them to more contact with health authorities and creates more opportunities for them to learn about BCG immunisation.

The sputum examination was the most frequently mentioned method of diagnosis of TB. This was not

unexpected as the sputum examination is the commonest method for screening of TB and it is usually available at all the health centres.

Although a great majority of the respondents believed that TB is treatable and can be cured by western medicine, only about one-third of the respondents knew the correct duration for treatment of TB. To know the duration of the treatment is important as they would be well prepared and this will help to reduce the defaulters from treatment within the community. TB treatment used to be years, however with the present drug regimes, treatment duration has been drastically reduced. The misconception about the treatment for TB in the present study requires some adjustment through proper health education.

It would be important to know why a large proportions of those who are suffering and knowing the symptoms of TB failed to seek care from the health facilities. It is possible that they actively solicit care for themselves from relatives or friends, or seek the assistance of traditional healers or because of the social stigma that is attached with the disease. In many cultures, the largely unremarked social stigma of TB contributes to the abandonment of the treatment and lengthy delays in seeking professional care. Similarly, in East Africa, attribution of TB symptoms to witchcraft or other folk illnesses causes delays in seeking professional treatment[7]. In Mexico City, a survey of patients hospitalised in the San Fernando Hospital noted 15% of the TB patients expected rejection by their families when they return home from hospital[7]. A study of ambulatory patients in Mexico City showed that those who abandoned TB treatment ascribed their default to the fear of rejection by their relatives. 25% of those who had defaulted had failed to tell their families of their diagnosis. In this present study, a great majority of the respondents considered TB as socially acceptable by the families and the people in the community, it suggests that tuberculosis is a socially acceptable disease in this region. However, closer examination of the responses revealed various paradoxical issues. Despite ascribing TB as socially acceptable, a large proportion of the respondents expressed that getting TB is embarrassing, a disgrace to their families and sensitive to discuss about it. These behaviours suggest that at the private level, the respondents were still perceived negative social attitudes towards TB.

TB is associated with social stigma (e.g. poor food and dirty)[10]. In the present study, a considerable large number (22%) of the respondents perceived TB patients to be dirty people and the majority of the respondents also perceived that TB patients should not mix with others even though they were under treatment because of the fear of being infected. This misconception and unhelpful negative social attitudes should be corrected.

Although TB is a common disease in this region, only very small proportion of respondents considered that they or their family were at high risk of getting TB. This showed that the people here either believed that TB is a rare disease or TB attacks only certain people. Individuals with this type of attitude may delay seeking professional treatment if they get TB. This is because people are not inclined to seek medical attention for illnesses, which they perceived as less common[10]. Therefore, information should be conveyed to them to make them aware that TB is a common disease in this region and will not spare anybody.

It is very interesting to note that almost all the respondents said that they will consult a medical doctor if they contracted TB. In addition, a great majority (90%) also said that TB can be treated by western medicine. This finding suggest that modern medicine is widely acceptable for treatment of TB in this region.

In the present study, almost all the respondents expressed that they would like to have more information about TB. This attitude of wanting to know more about TB will result in positive attitudes towards TB through health education. The majority of them said that the information with regards to TB obtained from clinics, health centre or by attending health talks but nobody mentioned about mass-media such as newspaper, TV and Radio.

Recommendations

Based on the findings of the research, the author would like to make the following recommendations which could serve as information to government agencies, NGOs (non-government organisation) and the community.

Health education

The study indicates that the knowledge about TB were poor among the people in the community. The ministry

of health, other government agencies, academic, NGOs, GPs (general practitioner), religious groups and the community need to take effective steps to combat this deficiency. A system of health education which could be suitably applied in this region should be developed. Health education programmes should be designed to empower the community with knowledge and also to change the people's attitudes towards TB because it is a well known fact that the knowledge alone does not necessarily lead to changes in attitude or behaviour. However, if we increase the awareness among the people in the community, there is every chance that most of the negative attitudes attached to the disease will be removed.

Health activities
Health campaign, exhibition and health talks should be organised in a regular basis to disseminate the information to the community. To further raise public awareness, action should be taken to join other agencies in declaring certain week or day in each year as tuberculosis week or day and during this period the awareness about TB should be promoted actively through mass media, exhibition, campaign, seminar and etc.

Training of health workers
Health staff needs to be aware of the importance of disseminating information and should take a major role to advocate the problem in community. Short training courses for health staff should be held in a regular basis to make the health staff more familiar with the use of health education aids, materials and guidelines, and give them more confidence in implementing health education.

Empower of the community
The community should encourage to share the responsibility and to participate actively in any health education activities to ensure its success. Cured tuberculosis patients and "Ketua kampungs" (village headmen) should be actively involved in health education activities. Basic training if possible should be arranged for them and visual aid material should be provided for this purpose.

Further research
The study on knowledge and attitudes about TB can be regarded as preliminary step towards planning a good TB health education programmes. Therefore, more studies should be carried out in order to strengthen the TB control programmes.

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