Original Article

High School Students' Knowledge on Tuberculosis Prevention: A Quantitative Survey in Bhaktapur of Nepal

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Abstract

Background: Tuberculosis is a major disease worldwide. Low level of awareness, economic status, unemployment, and educational status is playing a vital role in causing tuberculosis in Nepal. The study was conducted to assess knowledge of preventive measures for tuberculosis among high school students at the Bhaktapur district of Nepal.

Methods: A cross-sectional study was carried out among 192 high school students. Pretested semi-structured questionnaire was applied to collect data from randomly selected students. Ethical approval and consent were obtained before data collection. The data were analyzed using SPSS 20v and interpreted as frequency, percentage and measured knowledge level.

Results: Among 192 participants, more than half (51%) were male. All the participants had heard about tuberculosis (TB), and 90.6% of the participants knew the meaning of tuberculosis. More than half (53.7%) of the participants told that smoking is the major risk factor for TB and 96.9% of participants agreed that TB is transmissible. Almost all (97.9%) participants expressed covering mouth and nose when coughing and sneezing, keeping house with proper ventilation and sunlight as preventive methods of tuberculosis. Similarly, more than half (63.5%) of the participants supported avoiding being close to the TB patient as a preventive measure. More than half of the participants (59.4%) had inadequate knowledge of preventive TB practices.**Conclusions:** It is to be concluded that more than half of the high school students had inadequate knowledge of preventive measures of tuberculosis. It shows that there is a need for planning and implementation of the awareness program on tuberculosis in high school students.

Key words: High school students, Tuberculosis, Preventive measures, Awareness

الملخص

خلفية: السل مرض ينتشر في جميع أنحاء العالم. يلعب انخفاض مستوى الوعي والوضع الاقتصادي والبطالة ومستوى التعليم دورًا حيويًا في الإصابة بمرض السل في نيبال. أجريت هذه الدراسة لتقييم المعرفة حول التدابير الوقائية لمرض السل بين طلاب المدارس الثانوية في منطقة باكتابور في نيبال.

طريقة البحث: هذه دراسة مقطعية اجريت بين 192 من طلاب المدارس الثانوية في نيبال. تم تطبيق الاستبيان لجمع البيانات من طلاب تم اختيارهم بشكل عشوائي. تم الحصول على الموافقة الأخلاقية قبل جمع البيانات. تم تحليل البيانات باستخدام برنامج التحليل الاحصائي والتعبير عنها في شكل نسب مئوية وترددات وقياس مستوى الوعي.

النتائج: من بين 192 مشاركًا، كان أكثر من نصفهم (51٪) من الذكور. كان جميع المشاركين قد سمعوا عن مرض السل و90.6 ٪ من المشاركين كانوا يعرفون معنى السل. أفاد أكثر من نصف المشاركين (53.7٪) أن التدخين هو عامل الخطر الرئيسي لمرض السل و96.9٪ من المشاركين وافقوا على أن مرض السل قابل للانتقال. أعرب معظم المشاركين (97.9٪) عن تغطية الفم والأنف عند السعال والعطس مع الحفاظ على التهوية الجيدة وأشعة الشمس في المنزل كطرق وقائية للسل. وبالمثل، أيد أكثر من نصف المشاركين (63.5 ٪) تجنب الوجود بالقرب من مريض السل كإجراء وقائي لمنع الإصابة بالمرض. كان لدى أكثر من نصف المشاركين (59.4٪) معرفة غير كافية بشأن ممارسات السل الوقائية.

الخلاصة: استنتجت الدراسة أن أكثر من نصف طلاب المدارس الثانوية ليس لديهم معرفة كافية بالتدابير الوقائية للسل. هنالك حاجة إلى تخطيط وتنفيذ برامج توعية حول مرض السل لطلاب المدارس الثانوية بنيبال.

الكلمات المفتاحية: طلاب المدارس الثانوية، السل، التدابير الوقائية، التوعية

Introduction

Tuberculosis (TB) is a common and deadly infectious disease caused by Mycobacterium tuberculosis. It spreads from person to person through air, when infected patients cough, sneeze or spit[1]. The vast majority of tuberculosis deaths are occurring in developing countries with more than half of all deaths are occurring in Asia[2]. Weakened immune system is also a risk factor of tuberculosis[3]. Symptoms of tuberculosis of the lungs include cough for three or more weeks, bloodstained sputum and chest pain[4]. For the prevention of tuberculosis, protection against exposure to tuberculosis, encouraging diagnosis and treatment of patients with positive pulmonary tuberculosis, and proper ventilation are important parameters[5].

Globally, the TB mortality rate has decreased by nearly half between 1990 and 2013, and decreasing at around 3% per year with an overall reduction between 2000–2017 was 42%[6]. Over 95% of tuberculosis deaths occur in low and middle-income countries (LMICs), and it is among the top causes of mortality for women aged 15 to 44[7]. Every other person in the world is infected with tuberculosis[8]. Most of the human faces of the epidemic are adults of productive age group (15-49 year)[7].

A study in India revealed there were ignorance, wrong knowledge and wrong practices demonstrated by senior secondary students. Similarly, studies in India, Bangladesh, Italy, and Nigeria concluded that the poor knowledge of TB need to be addressed through health education and awareness among university students, individuals and spouses[9–11]. In developing countries, the knowledge on tuberculosis is generally poor, so, the researcher recommended additional efforts for educating public and clarifying the taboos about tuberculosis[12].

In Nepal, every year about 40,000 people get infection with tuberculosis, and among them, 20,000 develop infectious pulmonary disease[13]. Under the National tuberculosis program of Nepal, many positive cases of TB had been treated[14].

Several studies had focused on regular awareness program on causes, disease transmission and preventive measures of TB among students focusing one health[5,8,15–18]. Similarly, a study suggested that undergraduate medical students could also be involved to change the behaviors towards TB[19]. Likewise, a study in Nepal revealed lack of knowledge on effects of incomplete treatment and suggested to emphasize on providing education to the patients on the treatment[20]. Few studies suggested for more researches on older adolescents for investigating their knowledge and behavior is needed[21].

Adolescents are at high risk of increasing and spreading the tuberculosis infection as well as they are the message carriers to home. It would be beneficial to aware public and also reduces the disease rates by providing more information and knowledge about tuberculosis to adolescents.

The study aimed to assess the level of knowledge on tuberculosis and its preventive measures among high school level student of Bhaktapur district of Nepal.

Methods

The cross-sectional study design was applied for conducting the research in the high school students in Bhaktapur district of Nepal. A total of 192 high school students present on the day of data collection were selected for the study. The samples (high school students of class 9 and 10) were selected from two purposively identified schools in Bhaktapur. Similarly, semi-structured questionnaires were developed and pretested before data collection through self -administered techniques.

Before data collection, ethical clearance was taken from the research committee of Asian College for Advance Studies and taken permission from the selected schools. Study participants were explained about the purpose of the study and assured of confidentiality through anonymity and privacy of data use. Written consent was taken from all the student participants.

The collected data were checked for the completeness and correctness, coded and entered in the database. Likewise, data analysis was done using SPSS 20v to measure frequency, percentage and chi-square tests for associations between knowledge on the preventive measures of tuberculosis and socio-demographic variables. Besides, the level of knowledge was categorized into adequate scoring above 75 percentages, moderate scoring 50 to 75 percentages and inadequate scoring below 50 percentages for the interpretation.

Results

Socio-demographic characteristics

The study participants were from the age13 to 17 years where the majority of participants were from 14 and 15 years. Among them, more than half (51%) of the participants were male and came from municipalities. Similarly, most of the participants (61.5%) were from the *Newar* ethnic community, and 88.5% were from the Hindu religion. Also, more than two third of the participants (76%) belonged to the nuclear family. Among the parents of all respondents, almost all of the fathers (97.9%) and more than two third of the mothers (75.0%) were literate respectively. Regarding the occupation of the parents, about one-third of the fathers (30.2%) were engaged in business, and more than half of the mothers (57.3%) were housemakers.

Knowledge on Tuberculosis

Almost all participants (93.8%) had heard about tuberculosis and among them, maximum (85.4%) had received information from teachers followed by television (54.2%), radio (26.0%), newspaper (20.8%), health professionals (18.8%), family members (17.7%), friends (11.5%) and others (3.1%). Likewise, about one-tenth of family members (9.4%) of participants had suffered from tuberculosis in the past.

Most of the participants (90.6%) had known that tuberculosis is an infectious disease whereas the rest of the participants said it is hereditary, highly contagious and others.

Knowledge on risk factors, symptoms and treatment of tuberculosis

Most of the high school students have responded that smoking (53.7%) and bacteria (46.3%) are the risk factors, and other responses were lack of hygiene (18.9%), malnutrition (15.8%), overworking (15.8%), virus (12.6%) and curse of god (2.1%).

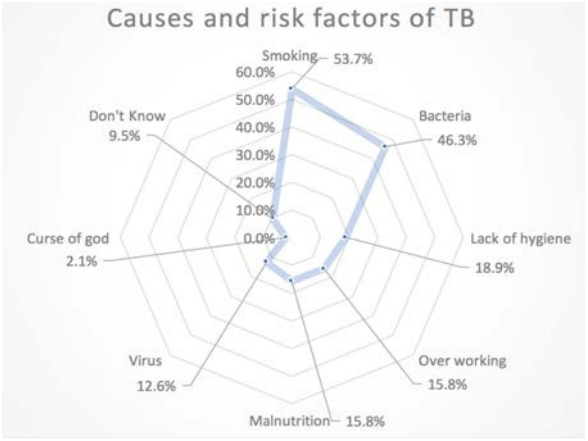


Figure 1: Participants knowledge on risk factors of TB

Likewise, most of the participants (96.9%) had agreed that TB is transmissible. Regarding the mode of transmission, mix thoughts were presented during the survey among high school students as it is transmitted through coughing and sneezing (21.3%), living with infected persons (21.3%), mother to child (21.3%), having meal together (12.8%), drinking in a same glass (12.8%) and sharing cloths (6.4%). Among the total participants, majority (68.9%) of the participants told that coughing more than 2 weeks followed by chest pain (55.6%), blood in sputum (37.8%), loss of appetite (37.8%), weight loss (31.1%) and fever during night time (30%) as the symptoms of TB.

Similarly, for the diagnostic evaluation of TB, only about half of the high school students (49%) stated that sputum examination is used to diagnose TB. One-third of them had said skin test (31.2%) followed blood test (21.9%), chest X-ray (20.8%) and very few said urine test (1%) as the diagnostic evaluation of TB. The majority of participants (66.7%) told that TB could be treated by anti-TB drugs combination and other participants expressed antibiotics (28.1%), traditional medicine (2.1%), avoiding sex (2.1%) and others (1%). Furthermore, half of the participants had answered the complete treatment for TB will take six months and the majority of them (78.1%) heard about the DOTS.

Knowledge of preventive measures of TB

In average, most of the participants were aware of the preventive measures of TB such as covering mouth and nose when coughing and sneezing (97.9%), proper ventilation and sunlight (97.9%), eating balanced diet (95.8%), sputum discharge in special plastic container (90.6%), hand-washing after coughing and sneezing or touching in public places (88.5%) and BCG vaccination in newborn child (82.3%). However, more awareness is desirable about issues like avoiding close contact with TB patients (63.5%) and isolation of TB patients (69.8%).

Table 1: Knowledge of preventive measures of TB

Preventive measures of TB (n=192)	Responses	Percentage
Eating a balanced diet to prevent TB	184	95.8
Encourage getting BCG vaccination in the newborn child	158	82.3
Seeking health service from health personnel	176	91.7
Going hospital when symptoms arise	170	88.5
Keeping house with proper ventilation and sunlight	188	97.9
Avoiding being close to the TB patient	122	63.5
Covering mouth and nose when coughing and sneezing	188	97.9
Handwashing after coughing and sneezing or touching in public places	170	88.5
Putting sputum discharge in special plastic container	174	90.6
Put face mask or proper tissue during coughing or sneezing	188	97.9
Isolation of the TB patient	134	69.8

Among the total high school students, more than half of the participants (59.4%) had inadequate knowledge, one-third of the participants (36.5%) had moderate knowledge and least of the respondent (4.2%) had adequate knowledge. Likewise, almost all the participants (90.6%) had adequate knowledge on preventive measures of TB followed by moderate knowledge (9.4%).

Table 2: Knowledge score of TB and its preventive measures among high school students

Knowledge level	Overall Knowledge		Knowledge of preventive measures	
	Frequency	Percent	Frequency	Percent
Less than 50% (inadequate)	114	59.4	0	0
50-75% (moderate)	70	36.5	18	9.4
More than 75% (adequate)	8	4.2	174	90.6

The study also found that the students living in joint families had more knowledge of TB than the students living in nuclear families. Likewise, among different ethnicities, *Chhetri* ethnic groups had more inadequate knowledge of TB followed by *Tamang* and *Newar* ethnic groups. However, there are no associations ($p>0.005$) between knowledge on TB and ethnicity as well as family type.

Discussion

From the results of this study, it has been found that one-third of the participants were from 15 years of age and mostly belonged to the Hindu religion and attendant of class 10. All the participants had heard about tuberculosis whereas a similar study carried out in Kenya and Ethiopia showed 93.3% [21] and 94.9% [22] of the participants respectively

had heard about TB. Likewise, this study reveals that the maximum (85.4%) participants had information about TB through teacher and television (54.2%).

The study found that more than ninety percentages (90.6%) had known about the meaning of TB. Similarly, 25% expressed that the TB is contagious and 2.1% told it is a hereditary disease. In contradiction, the findings of the research conducted in the Kingdom of Saudi Arabia in 2015 [5] showed that around 63.0% recorded that TB was infectious, while only 5.0% thought TB is hereditary.

Most of the study participants (96.9%) had expressed that TB is transmitted while in another study[1], nearly three fourth (73.9%) of the study participants were aware of the disease. Moreover, regarding the risk factors, more than half of the participants (53.7%) had told that smoking is the risk factors while in contrast to a study at Kingdom of Saudi Arabia[5] provided only about one-fourth of the participants (27.7%) felt it. Other risk factors are also expressed by the participants including the misconception that TB is caused by a virus.

Most of the participants (90.4%) in this study had said that TB is transmitted through coughing, sneezing without covering whereas 15 percentage less found in a study conducted at Bangladesh [10] that is 75 percent. Similarly, a study at Kingdom of Saudi Arabia[5] showed the 44.9 percent had prolonged cough which is nearly 20 percent less than in this study (68.9%). Furthermore, majority of the participants (66.7%) had agreed that TB is treated by anti- TB drugs combination while in another study [1], more than eighty percent (80.2%) had known the treatment. Half of the participants (50%) in this study knew the duration of drug intake; however, in a similar study, it was only 12.6%[5].

A study conducted by Rana et al. (2015)[10] revealed that 90% of the participants had heard about the DOTs while 78.1% had heard about DOTs in the present study. Similarly, in another study in Nepal, about 56% had heard DOTs[23]. All the participants agreed that the TB is curable whereas slightly less (84.1%) in a study conducted at Mongolia[1]. Almost all (97.9%) the participants were applying preventive measures such as covering mouth and nose when coughing and sneezing whereas in contrast to this study, only 42.9% were covering during coughing and sneezing[1].

In this study, only 4.2% of the student participants had adequate knowledge of TB, and 36.5% had a moderate level of knowledge while a similar study conducted in Ethiopia showed that 59.8% had good knowledge[24]. Likewise, almost all participants (90.6%) had adequate knowledge on preventive measures of TB in this study whereas a study conducted in Peru had shown less percentage (43.3%) had adequate knowledge[25]. Therefore, the researcher focused on the inclusion of tuberculosis education in the syllabus of upper-level school students[26]

Limitations

The study had participants of the students of 9 and 10 class and had not discussed the family members' practice, knowledge, and attitudes. There are many areas to explore the knowledge and engage broad areas and participants for the study to be thought for the research questions in the future.

Conclusions

Overall, least number of the high school students had adequate knowledge on TB whereas most participants had adequate knowledge regarding TB preventive measures. Despite the inclusion of TB in the school curriculum and awareness program from the media and government, students' knowledge level is still shallow. Moreover, the teachers should be trained in TB and its preventive measures and need to create a promising classroom environment for students. Therefore, this study is important for the school to plan the sessions and the government to focus the school level students for TB prevention and control.

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