

How to Cite:

Khalaf, A. T., Wan, J., Liu, X., Doustjalali, S. R., Sabet, N. S., lin, W. M., Linn, N. H., Zin, K. T., Kumar, S. S., Dar, H. T., Oo, K. T., Wong, R. S., Su, W. W. L., Ramli, N., Low, S., Yusuf, A., Kyaw, Y. W., Desa, M. N. M., Nazmul, M. H. M., Al-Jashamy, K., & Hussaini, J. (2022). Investigation and analysis of knowledge and perceptions on tuberculosis prevention and control among university students in Chengdu, China. *International Journal of Health Sciences*, 6(S1), 1487-1497. <https://doi.org/10.53730/ijhs.v6nS1.4906>

Investigation and Analysis of Knowledge and Perceptions on Tuberculosis Prevention and Control among University Students in Chengdu, China

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International Journal of Health Sciences ISSN 2550-6978 E-ISSN 2550-696X © 2022.

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Manuscript submitted: 27 Nov 2021, Manuscript revised: 09 Feb 2022, Accepted for publication: 18 March 2022

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Abstract--To explore Tuberculosis (TB) health promotion and education in universities, and to provide a feasible reference method and specific implementation measures for improving health education among university students. We collected a total of 811 respondents, using a uniform questionnaire online survey questionnaire network. The completed questionnaires were double-entered using EpiData3.1, the database was established, and the analysis was performed by Excel2016 and SPSS 22 software. The total awareness rate of the 8 core information on tuberculosis prevention and control was 74.2 %. Among them, “the state provides

free anti-tuberculosis drugs and major tests for infectious tuberculosis patients” with the lowest awareness rate of 49.2 %; followed by the awareness rate of “should care about tuberculosis patients and should not discriminate against tuberculosis patients”, for 63.8 %. The channels for college students to acquire knowledge about tuberculosis prevention were “newspapers and magazines”, accounted for 50.3 percent; “broadcasting, television and video” accounted for 52.4 %; “wall advertising, bulletin boards, slogans” accounted for 44.6 %; “School Health Education” accounted for 38.5 % of “school propaganda columns or publicity panels” accounted for 34.9 %. The favourite way for college students to promote was “watching TV” 40.3 %. In conclusion, the awareness rate of TB prevention and control knowledge among students at Chengdu University was low, and the health education of tuberculosis in colleges and universities still needs to be strengthened.

Keywords---Tuberculosis, health education, health promotion, questionnaire survey, Chengdu University, students.

Introduction

Tuberculosis (TB) is still considered one of the ten most important causes of death, and despite this, public awareness, especially among students, remains below the required level of prevention in terms of prevention and treatment in many countries of the world [1]. The lack of appropriate knowledge of university students may increase the risk of disease and its spread among students and even in society. Health education plays an important role in the prevention and treatment of tuberculosis. A number of studies have shown that school health promotion work has a significant effect on improving students' awareness rate [2]. The university students are highly organized, and the level of education is balanced, and it is easy to accept new knowledge, which is quite beneficial for carrying out large-scale awareness and education [3]. To improve knowledge of TB prevention and control, while exploring effective methods to health interventions, this study investigated the knowledge, beliefs and behaviours of Chengdu university students. We conducted a survey among Chengdu University students in China to assess TB knowledge and perceptions about prevention and control measures using a questionnaire.

Materials and Methods

Participants

The survey was conducted by Chengdu University. The number of colleges owned by Chengdu University is 14 and in the freshmen, sophomores and juniors of the 14 colleges, two classes are randomly selected by cluster random sampling. A total of 811 questionnaires were distributed in this survey, and 787 questionnaires were returned, of which 784 were valid, with an effective rate of 96.7%. The 784 students surveyed covered 30 provinces, municipalities, and autonomous regions except for Taiwan, Hong Kong, Macao and Shanghai, and all

29 provinces, municipalities and autonomous regions except Sichuan Province were unified as “Foreign nationality” (Table 1).

Table 1
Survey object (784) general characteristics analysis Feature distribution

Distribution	Percent (%)
gender	
male	39.2%
Female	60.8%
Account	
city	40.4%
rural	59.6%
Birthplace	
Sichuan	85.7%
Foreigner	14.3%
profession	
medicine	6.4%
Non-medical	93.6%
Nationality	
Han nationality	94.1%
Yi	1.9%
Tibetan	0.9%
other	3.1%

Data Collection and Measurement Tool

On June 20-23, 2018, the investigation team used the questionnaire to conduct online surveys to each class. The questionnaire design was based on 2006 National Public Tuberculosis Prevention Knowledge, Belief, and Behavior Questionnaire [4]. All investigators were trained prior to the survey to unify survey methods and survey criteria.

The content includes the basic situation of college students, the basic knowledge of tuberculosis prevention, the understanding of free policies and tuberculosis prevention and treatment institutions, the status of beliefs, the channels of information acquisition, the form of activities, or the preferences of knowledge carriers.

Data Analysis

- Statistical methods: The completed questionnaires were double-entered using EpiData3.1, the database was established, and the analysis was performed by Excel2016 and SPSS22 software. The statistical test of each rate was performed by χ^2 test. $P < 0.05$ was considered statistically significant.

- Awareness rate: 8 core information on tuberculosis control refer to the “Guidelines for the Implementation of China Tuberculosis Prevention and Control Plan (2008 Edition)” [5]. (1) Calculation of the total awareness rate of 8 core information: total awareness rate of core information = correct answer number of core confidence items/number of questionnaires $\times 8 \times 100\%$ for each respondent; (2) Calculation of single information awareness rate: single information awareness rate = number of respondents who correctly answered a certain knowledge/number of people surveyed $\times 100\%$.
- Media Coverage: The rate at which TB-related information was obtained from a medium (media coverage = number of people receiving information from a medium/number of surveys $\times 100\%$).

Results

The total awareness rate of 8 core information students in this survey was 74.2% (4652/6272) (Table 2). According to gender and household registration, there was no significant difference in the total awareness rate of 8 core information among students ($\chi^2 = 0.721$, $P > 0.05$; $\chi^2 = 0.347$, $P > 0.05$); according to majors and places of origin, medical students always knew and the rate was higher than the total awareness rate of non-medical students ($\chi^2 = 12.811$, $P < 0.05$); the total awareness rate of Sichuan students was higher than that of foreign students, the difference was statistically significant ($\chi^2 = 9.090$, $P < 0.05$). The awareness rate of each of the eight core information items is shown in Table 3. Among them, the “state-provided free anti-TB drugs and major tests for infectious TB patients” had the lowest awareness rate of only 49.2%; followed by should care about tuberculosis patients and should not discriminate against TB patients, was 63.8%.

Table 2
Comparison of the total awareness rate of 8 core information on tuberculosis prevention and control

variable	Number of responses	Number of correct answers	Total awareness rate (%)	χ^2	P-value
gender					
male	2456	1836	74.7	0.721	>0.05
Female	3816	2816	73.8		
Account					
city	2536	1891	74.6	0.347	>0.05
rural	3736	2761	73.9		
profession					
medicine	400	327	81.2	12.811	<0.05
Non-medical	5872	4325	73.7		
Birthplace					
Sichuan	5376	4024	74.9	9.090	<0.05
Foreigner	896	628	70.1		
total	6272	4652	74.2		

Table 3
The rate of awareness of core information on tuberculosis prevention among the respondents (784)

8 core messages	Knowledgeable	Awareness rate (%)
Tuberculosis is an infectious disease that seriously endangers human health	626	79.8
Pulmonary tuberculosis is mainly transmitted to others by coughing, sneezing, or spraying droplets when speaking loudly.	539	68.8
Cough and cough for more than 2 weeks, or have hemoptysis, blood stasis symptoms, should be suspected of tuberculosis	684	87.2
Specialized institutions for the inspection and treatment of tuberculosis are offered in towns and cities which in the county level and above the county level in China.	641	81.8
Tuberculosis patients should go to a specialized tuberculosis prevention and control agency for inspection, treatment and management	712	90.8
As long as regular treatment is adhered to, tuberculosis can be cured	564	71.9
The State provides free anti-tuberculosis drugs and major tests for patients with infectious tuberculosis	386	49.2
Should care about TB patients, should not discriminate against TB patients	500	63.8

The distribution of the number of 8 core information-aware items is shown in Table 4. 16.7% answered all of the 8 core information correctly, 99.6% answered 1 or more core information correctly, 98.1% answered 2 or more core information correctly, 95.5% answered 3 or more core information correctly, 91.8% answered 4 or more core information correctly, and 85.3% answered 5 or more core information correctly. 71.6% answered 6 or more core information correctly and 46.6% answered 7 or more core information correctly. For all of the 8 core information, 0.4% of the respondents answered incorrectly.

Table 4
784 people answered the distribution of the number of known items of tuberculosis prevention and control core information

Number of correct answers	Answer	Answer rate (%)
≥1	781	99.6
≥2	769	98.1
≥3	749	95.5
≥4	720	91.8
≥5	669	85.3
≥6	561	71.6
≥7	365	46.6
8	131	16.7

Note 3 out of 784 respondents did not have a correct answer for 8 core messages, accounting for 0.4%.

In the college students surveyed, they believed that TB was a serious hazard to human health, infectious diseases and accounted for 79.8% (626/784) (Table 5).

Table 5
Questionnaires (784) on whether tuberculosis is a serious disease

Is tuberculosis serious?	Cognitive situation	Percent (%)
Yes	626	79.8
no	57	7.3
do not know	101	12.9

The information channels for college students to acquire knowledge about tuberculosis prevention are shown in Table 6. 52.4% of students chose “broadcast, television and video”, followed by “newspaper” 50.3% (Table 6).

Table 6
Coverage rate of 784 respondents for each tuberculosis core information channel

Message channel	Coverage	Coverage rate (%)	Message channel	Coverage	Coverage rate (%)
Newspapers and magazines	394	50.3	Knowledge lecture	281	35.8
Radio, television and video	411	52.4	School health education section	302	38.5
Poster (letter, brochure)	318	40.6	Academic journals and textbooks	184	23.5
Wall advertising, bulletin board, slogan	350	44.6	School propaganda column or publicity board	274	34.9

Large-scale publicity campaign	250	31.9	other	163	20.8
to chat with	141	18.0	Did not accept	52	6.6

In the answer to the question “Which kind of TB prevention knowledge is your favorite?” the top three were “watching TV”, 40.3 %, “wall advertising, bulletin board, slogan”, 38.3 %, “with A small gift for promotional content”34.1 % (Table 7).

Table 7
Selection and selection rate of promotional materials and publicity forms

Message channel	Choice	Selection rate (%)	Message channel	Choice (name)	Selection rate (%)
read newspaper	134	17.1	By issuing leaflets, brochures	227	29.0
Listen to the radio	94	12.0	A small gift with promotional content	267	34.1
watch TV	316	40.3	Organize large-scale publicity activities	182	23.2
Wall advertising, bulletin board, slogan	300	38.3	Medical staff promotion	223	28.4
Poster	184	23.5	School health education section	265	33.8
By chat	159	20.3	other	73	9.3

Discussion

The Chengdu University students involved in the survey were the full-time undergraduate college sponsored by the Chengdu Municipal People's Government. It implements the “provincial and municipal construction, city-based” school-running system. It is a local comprehensive university with engineering, literature, education, art, management, economics, law, science, medicine, and agronomy as its main subjects. The student source is widely distributed, and the student's cultural quality is good. Questionnaires were directly contacted by the heads of the colleges and supervised the completion of the survey, and the quality of the survey was guaranteed.

College students should fully explore their potential in the promotion of tuberculosis prevention knowledge and contribute to society while doing their own group communication work. In our study, the total awareness rate of medical students was higher than that of non-medical students ($x^2 = 12.811$, $P < 0.05$), so medical students should take the initiative to take responsibility to preach the knowledge of tuberculosis prevention and treatment. And college students are young and energetic and have a high level of culture. They have always been the main force in the volunteer team and can be a good social communicator. Therefore, for TB prevention and treatment institutions should establish long-term cooperation mechanism with universities, give full play to the role of university student unions, party organizations, and student volunteer organizations, carry out backbone training for college students, provide them with necessary technical support and guidance, and guide students to consciously act. Use the network, microblogging, social practice and other means to carry out communication activities within schools, between schools and between schools and society, expand the breadth and depth of knowledge dissemination of tuberculosis prevention, and raise the awareness rate of public tuberculosis prevention and control knowledge.

Colleges and universities are places with a relatively dense population and large mobility. Due to the characteristics of learning tension and collective life, it is prone to the onset of tuberculosis, which is a key place for tuberculosis prevention and treatment. According to the results of the fifth national tuberculosis epidemiological survey in 2010, two age groups of 20-25 years old and 75-80 years old are the two peaks of active tuberculosis [6]. Therefore, college students should be the key population of tuberculosis prevention and control. If students get TB, and they can't get timely treatment, it will not only affect students' normal study, employment, and even lose their ability to work. It will bring serious harm to students' physical and mental health, and it may also infect others, for individuals, families, schools, and Society is a great hazard.

The fifth national survey on tuberculosis epidemiology in 2010 showed that the awareness rate of national core knowledge of tuberculosis prevention and control knowledge was 57.0% [6]. Although the awareness rate of college students in this survey (74.2%) was higher than the national level of the fifth national tuberculosis epidemiological survey in 2010. But is it is still lower than the "National Tuberculosis Control Plan (2011-2015)", that is "by 2015, the awareness rate of core information on tuberculosis prevention and control reached 85%" [7].

Among the 784 undergraduate students surveyed, 16.7% answered all of the 8 core information correctly, 99.6% answered 1 or more core information correctly, 98.1% answered 2 or more core information correctly, 95.5% answered 3 or more core information correctly, 91.8% answered 4 or more core information correctly, and 85.3% answered 5 or more core information correctly. 71.6% answered 6 or more core information correctly and 46.6% answered 7 or more core information correctly. For all of the 8 core information, 0.4% of the respondents answered incorrectly. Also 79.8% of the students considered tuberculosis is an infectious disease that seriously endangers human health. On the one hand, these data showed that college students had little knowledge about tuberculosis prevention

and control. On the other hand, these data showed that college students believed that the tuberculosis is a serious disease. Based on this situation, it is difficult to avoid the occurrence of students' panic when a school has a cluster of tuberculosis and spread. Therefore, it is imperative to further strengthen the emphasis on TB health education in colleges and universities, reform the TB health education in colleges and universities, and create more opportunities and channels for college students to learn and understand TB prevention knowledge.

Online media and publicity materials should become the main form of knowledge dissemination of tuberculosis prevention and control among college students. Our survey results showed that the main channels for college students to acquire knowledge of TB prevention and treatment were "radio, television and video" (52.4%) and "newspapers and magazines" (50.3%), Their favourite form of publicity was "watching TV" (40.3%) and "wall advertising, publicity columns, slogans" (38.3%), their favourite propaganda material was "small gifts with propaganda content" (34.1%). The implementation of various forms of peer education activities, leaflet distribution activities, communication and dialogue activities with professionals, patient care activities and other interpersonal communication activities is an effective form of dissemination of tuberculosis health education for college students. Nowadays, social media such as Q Q, WeChat and Weibo have been highly praised by college students. They have been increasingly integrated into the aspects of college students' study, communication and life, and have an impact on their thoughts and behaviors. Therefore, the use of online media to carry out tuberculosis health education for college students is an indispensable form of propaganda. In addition, in the selection of traditional promotional materials, attention should be paid to making pictures and posters suitable for college students. College students should fully explore their potential in the promotion of tuberculosis prevention knowledge and contribute to society while doing their own group communication work.

In conclusion, the awareness rate of TB prevention and control knowledge among students at Chengdu University was low, and the health education of tuberculosis in colleges and universities still needs to be strengthened.

Acknowledgement

This work was supported by Chengdu University and SEGi University, Faculty of Medicine.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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