

An analysis of public awareness of core information on tuberculosis in Guizhou Province

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Background: Tuberculosis (TB) is a global public health problem and China is one of the 22 countries with a high TB burden. The characteristics of the epidemic of TB in China include a high rate of infection, high prevalence, serious drug resistance, and low rate of decline and the TB epidemic in Guizhou Province is more serious than in other parts of the country. We conducted a survey during September and October 2019 to investigate public awareness of core TB information.

Methods: A multi-stage, stratified random sampling method was used to survey individuals at 18 investigation sites on their awareness of core information related to TB. SPSS22.0 software was used to analyze data and P<0.05 was considered statistically different.

Results: Of the 10,563 questionnaires collected, the total awareness rate of TB, the awareness rates of transmission, symptoms, treatment (doctor visit way), preferential policies, and prognosis of TB were 62.5% (95% CI: 0.6169–0.6329), 62.8% (95% CI: 0.6190–0.6374), 75.2% (95% CI: 0.7434–0.7599), 66.4% (95% CI: 0.6553–0.6733), 39.1% (95% CI: 0.3819–0.4005), 61.2% (95% CI: 0.6029–0.6215) respectively. The personal awareness qualified rate was 45.0% (95% CI: 0.4404–0.4594) and multivariate logistic regression analysis showed that education was the main factor associated with awareness of TB.

Conclusions: Public awareness of the core information about TB is low in Guizhou Province. Intensive education about TB should be carried out.

Keywords: Tuberculosis (TB); awareness rate; health promotion and education

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Introduction

Tuberculosis (TB) is a serious disorder and significant threat to global public health (1). China is one of 22 countries with a high burden of TB (2) and there is a statutory requirement to report cases as a Grade A and B infectious disease in this country. The TB epidemic presents characteristics of a high rate of infection, high prevalence, high drug resistance, low decline, and extremely uneven development across regions (3). The TB epidemic in Guizhou Province is more serious than in other parts of the country (4) with higher rate of drug resistance. In order to assess the public awareness of core TB information, we conducted a survey in 18 monitoring sites in Guizhou Province from September to October 2019. We present the following article in accordance with the SURGE reporting checklist (available at http://dx.doi.org/10.21037/apm-20-2473).

Methods

Study population

We randomly enrolled 10,563 permanent residents (defined as having lived in Guizhou for more than six

months) between 15 and 69 years of age. This study was approved by the Ethics Committee of Guizhou Provincial Center for Disease Control and Prevention and all survey subjects signed an informed consent form. All procedures performed in this study involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013).

Sampling method

A multi-stage, stratified random sampling method was adopted involving 18 monitoring sites. Using the PPS method to select six town/streets from each monitoring sites, two villages/communities from each town/street were selected. Using a simple-random sampling method 50 families from each sample town/street were then selected and the KISH random method then employed to select one permanent resident aged 15–69 from each sample family as the study object.

Survey method

According to previous study (4), a uniformly printed questionnaire was used, and a face-to-face questionnaire survey conducted by trained investigators in the homes of interviewees' or other specific places. The questionnaire sought six demographic characteristics on the interviewees and their knowledge of five core messages in information about TB including its route of transmission, symptoms, type of medical treatment required (doctor visit way), prognosis, and associated preferential policies.

Judgment criteria

The awareness rate was calculated as the percentage of the total number of items that all respondents correctly answered regarding the core information to the total number of items answered by all the respondents. Personal knowledge was considered qualified in those who correctly answered questions pertaining to four of the five categories of information. The rate of correct awareness was calculated as the percentage of individuals who answered questionnaire correctly in the survey (5).

Statistical analysis

SPSS22.0 software was used for statistical analysis. All data

were expressed as numbers and percentages and compared with the χ^2 test. Logistic regression analysis was used to analyze the relationship of factors associated with the rate of awareness and P<0.05 was considered statistically significant.

Results

General characteristics

We interviewed 10,800 permanent residents in Guizhou Province from September to October 2019 and 10,563 (97.8%) validated questionnaires were enrolled for analysis. Among these, 4,592 were located in urban populations (43.5%) and 5,971 in rural areas (56.5%), and the urban-rural population ratio was 0.77:1. There were 5,565 males (52.7%) and 4,998 females (47.3%) with a male to female ratio of 1.11:1, and 6,850 Han people (64.8%) and 3,713 ethnic minorities (35.2%) with a Han to ethnic minorities ratio of 1.84:1. *Table 1* shows these details.

Awareness rate of information about TB in different populations

The awareness rate of TB symptoms (Doctor visit way) was 66.4% (95% CI: 0.6553-0.6733), and the difference in the awareness rate among the populations with different classification was statistically significant. The awareness rate of TB transmission routes was 62.8% (95% CI: 0.619-0.6374) and except for "ethnicity", the awareness rate differed among populations with different characteristics with statistical significance. The awareness rate of TB symptoms was 75.2% (95% CI: 0.7437-0.7599) and except for "ethnicity", the awareness rate differed among populations with different characteristics with statistical significance. The awareness rate of preferential policies for TB was 39.1% (95% CI: 0.3819-0.4005), and except for "gender" and "ethnicity" the awareness rate differed among populations with different characteristics with statistical significance. The TB prognosis awareness rate was 61.2% (95% CI: 0.6029-0.6215), and except for "gender" and "ethnicity" the differences in the awareness rate differed among populations with different characteristics with statistical significance. The results of the total awareness rate showed that for questions on the five core messages 32192 items were answered correctly, and the total awareness rate was 61.0% (95% CI: 0.6169-0.6329). See Table 2 for details.

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TADIC I Demographic characteristics of interviewees (ii=10,30	Table 1	Demograph	ic characteristi	cs of interviewees	(n=10,563
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Demographic characteristics	Number (n/%)				
District					
Urban	4,592 (43.5)				
Rural	5,971 (56.5)				
Sex					
Male	5,565 (52.7)				
Female	4,998 (47.3)				
Age (years)					
15–	871 (8.2)				
25–	1,463 (13.9)				
35–	1,948 (18.4)				
45–	3,057 (28.9)				
55–	2,246 (21.3)				
65–69	978 (9.3)				
Education					
Illiteracy	2,095 (19.8)				
Primary school	3,318 (31.4)				
Junior school	3,184 (30.1)				
High school	1,057 (10.0)				
College	909 (8.6)				
Profession					
Civil servant	61 (0.6)				
Teacher	222 (2.1)				
Medical professional	124 (1.2)				
Other agents	284 (2.6)				
Students	415 (3.9)				
Farmer	7,214 (68.3)				
Worker	481 (4.6)				
Employee	418 (4)				
Other professional	1,344 (12.7)				
Ethnic group					
Han	6,850 (64.8)				
Minority group	3,713 (35.2)				

Analysis of personal awareness qualification rate and its influencing factors

Among the 10,563 survey respondents, 4,752 people answered 4 or more pieces of information correctly, and the pass rate of personal awareness was 45.0% (95% CI: 0.4404–0.4594). Taking the individual awareness of TB as the dependent variable (eligible =1, unqualified =0), and 5 variables with significant significance in the χ^2 test as the dependent variable for multivariate logistic regression analysis, the stepwise method was adopted to fit the model, and multiple categorical variables introduced as dummy variables. This showed that age under 55 years old is a protective factor for the personal awareness rate of TB, and an education level below high school is a risk factor for the personal awareness rate of TB (*Tables 3* and 4).

Discussion

The total awareness rate of core TB information in the Guizhou investigation is 61.0%. Although this is higher than the 57.0% public awareness rate of TB prevention knowledge seen in the Fifth National Tuberculosis Epidemiological Sample Survey in 2010, itis well short of the 85% recommended in the National Tuberculosis Prevention and Control Plan [2011–2015] (6). There are several reasons for this. Firstly, there remains insufficient health education on TB in our province especially in the areas of "preferential policies" (awareness rate of 39.1%) and "prognosis" (awareness rate of 61.2%). Secondly, in recent years, while the number of younger educated individuals in the population is growing, most residents in Guizhou Province are the elderly and people with lower education levels. The average age of the survey respondents in this survey is 46.19±13.65 years old and have achieved only junior high school education levels (81.3% of the whole study population), and the total awareness rate of these two types of population is low, which may cause the low total awareness rate of the province (7-10). The personal awareness pass rate was mainly influenced by education level and age group. Lower rates were seen among those with a lower level of education and rates decreased with increasing age, especially in the over

 Table 2 Awareness of TB in different population [n (%)]

Characteristics	Transmission route	Symptom	Doctor-visit way	Preferential policies	Prognosis
District					
Urban	2,988 (65.1)	3,613 (78.7)	3,379 (73.6)	1,874 (40.8)	2,732 (59.5)
Rural	3,648 (61.1)	4,327 (72.5)	3,638 (60.9)	2,258 (37.8)	3,735 (62.6)
Total	6,636 (62.8)	7,940 (75.2)	7,017 (66.4)	4,132 (39.1)	6,467 (61.2)
χ^2 value	17.6	53.7	186.5	9.8	10.2
P value	<0.001	<0.001	<0.001	<0.05	<0.001
Sex					
Male	3,781 (67.9)	4,352 (78.2)	3,937 (70.7)	2,223 (39.9)	3,402 (61.1)
Female	2,855 (57.1)	3,588 (71.8)	3,080 (61.6)	1,909 (38.2)	3,065 (61.3)
χ^2 vale	132	58	98.2	3.4	0.1
P value	<0.001	<0.001	<0.001	0.1	0.8
Age (years)					
15-	655 (75.2)	774 (88.9)	720 (82.7)	519 (59.6)	630 (72.3)
25-	1,102 (75.3)	1,318 (90.1)	1,226 (83.8)	690 (47.2)	961 (65.7)
35–	1,379 (70.8)	1,617 (83.0)	1,466 (75.3)	793 (40.7)	1,238 (63.6)
45-	1,854 (60.6)	2,211 (72.3)	1,967 (64.3)	1,108 (36.2)	1,827 (59.8)
55-	1,155 (51.4)	1,429 (63.6)	1,196 (53.3)	711 (31.7)	1,266 (56.4)
65-69	491 (50.2)	591 (60.4)	442 (45.2)	311 (31.8)	545 (55.7)
χ^2 value	405.8	613.6	747.6	280.2	99.5
P value	<0.001	<0.001	<0.001	<0.001	<0.001
Education					
Illiteracy	674 (32.2)	919 (43.9)	696 (33.2)	554 (26.4)	984 (47.0)
Primary school	1,881 (56.7)	2,314 (69.7)	1,917 (57.8)	1,209 (36.4)	2,073 (62.5)
Junior school	2,406 (75.6)	2,807 (88.2)	2,598 (81.6)	1,393 (43.8)	2,108 (66.2)
High school	895 (84.7)	1,012 (95.7)	959 (90.7)	519 (49.1)	690 (65.3)
College	780 (85.8)	888 (97.7)	847 (93.2)	457 (50.3)	612 (67.3)
χ^2 value	1,539.2	1,926.7	2,047.3	271.7	236.4
P value	<0.001	<0.001	<0.001	<0.001	<0.001
Profession					
Civil servant	53 (86.9)	59 (96.7)	56 (91.8)	33 (54.1)	41 (67.2)
Teacher	194 (87.4)	216 (97.3)	208 (93.7)	94 (42.3)	142 (64.0)
Medical professional	118 (95.2)	124 (100)	116 (93.5)	66 (53.2)	72 (58.1)
Other agents	219 (77.1)	265 (93.3)	250 (88)	120 (42.3)	175 (61.6)
Students	326 (78.6)	372 (89.6)	348 (83.9)	269 (64.8)	321 (77.3)
Farmer	4,010 (55.6)	4,878 (67.6)	4,126 (57.2)	2,580 (35.8)	4,290 (59.5)

Table 2 (continued)

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Characteristics	Transmission route	Symptom	Doctor-visit way	Preferential policies	Prognosis
Worker	366 (76.1)	426 (88.6)	398 (82.7)	204 (42.4)	304 (63.2)
Employee	348 (83.3)	405 (96.9)	377 (90.2)	200 (47.8)	272 (65.1)
Other professional	1,002 (74.6)	1,195 (88.9)	1,137 (84.7)	566 (42.1)	850 (63.2)
χ^2 value	548.7	719.3	888.1	188.1	62.7
P value	<0.001	<0.001	<0.001	<0.001	<0.001
Ethnic group					
Han	4,315 (63)	5,176 (75.6)	4,654 (67.9)	2,677 (39.1)	4,159 (60.7)
Minority group	2,321 (62.5)	2,764 (74.4)	2,363 (63.6)	1,455 (39.2)	2,308 (62.2)
χ^2 value	0.2	1.6	20	0.1	2.1
P value	0.6	0.2	<0.001	0.9	0.1

Table 2 (continued)

TB, tuberculosis.

Table 3 Factors associated with awareness of TB

Variables	Factors	Code	Vale
Dependent variable	Total rate of awareness	Y	Qualified =1, unqualified =0
Independent variable	District	X1	Urban =1, rural =2
	Sex	X2	Male =1, female =2
	Education	X3	Illiteracy =1, primary school =2, junior school =3, senior school =4, college =5
	Age	X4	15-=1, 25-=2, 35-=3, 45-=4, 55-=5, 65-69=6
	Ethic group	X5	Nan =1, minority group =2

TB, tuberculosis.

Table 4 Logistic regression analysis results

Factors	В	S.E.	Wald χ^2	P value	Exp(B)	95% CI
Constant	-1.13	0.1	127.718	<0.001	-	-
Group of age						
15– (reference)						
25–	-0.189	0.092	4.248	0.039	0.828	0.692-0.991
35–	-0.109	0.09	1.495	0.221	0.896	0.752-1.068
45–	-0.313	0.087	13.073	<0.001	0.731	0.617–0.866
55–	-0.653	0.091	51.654	<0.001	0.52	0.435-0.622
65–69	-0.553	0.109	25.625	< 0.001	0.575	0.464–0.713
Education						
Illiteracy (reference)						
Primary school	0.961	0.069	194.382	<0.001	2.615	2.285-2.994
Junior school	1.701	0.071	570.329	<0.001	5.481	4.767-6.302
High school	2.066	0.091	513.391	<0.001	7.897	6.604-9.442
College	2.140	0.098	474.72	<0.001	8.501	7.012–10.305

55-year age group. Combined with the results of this survey, this provides a reference to target the population range with relevant health education or TB intervention.

The survey showed that the overall awareness rate of core TB information in Guizhou Province is low. Our province is a poor province in the west, and poor counties account for about 74.2% of the province population. Poor people generally have a low educational level and poor awareness of disease prevention. The primary health education institutions in the province are not sound and the development of staff is lagging, which restricts the accessibility and effectiveness of health education. The national government has recently put forward higher requirements and expectations for health promotion and health education across the country. This will see a new form of health education which is contemporary and responsive and changes the focus from disease treatment to health promotion. The instigation of national basic public health projects using various forms of popular science, health education, and publicity (11) will increase the awareness rate of common infectious diseases such as TB and improve the level of overall health literacy and general health of residents. In our opinion, the government should disseminate this information through internet, especially by cellphone, and put more fund to support professionals to educate residents.

Limitation

This study missed some individuals came from outside Guizhou Province, since TB is virtually an infectious disease. Population movement has a strong influence on TB transmission.

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Footnote

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