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ORIGINAL RESEARCH

Knowledge, Attitude, and Practices Toward Tuberculosis Among Health Faculty and Non-Health Faculty Students of Kabul University and Kabul University of Medical Sciences, Kabul, Afghanistan

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Introduction: Afghanistan ranks 24th among the countries with a high TB death rate. The number of TB patients has unfortunately increased by 3% during 2022 compared to 2021. University students are among the high-risk groups for TB. The frequent and high level of person-to-person contact in universities increases the transmission of infectious diseases including TB. This study aimed to evaluate the level of knowledge, attitude, and practices of university students regarding tuberculosis to better understand the situation.

Methods: A cross-sectional questionnaire-based study was conducted among 415 health and non-health faculty students between October and December 2022. Multi-stage stratified sampling technique was used to collect the data and data were analyzed using SPSSv25. Cross-tabulation and a Chi-Square test were used to identify differences between groups.

Results: The results of this study showed that 18.1% of health and 2.4% of non-health faculty students had good knowledge about TB. There was a significant difference in the knowledge of health and non-health faculty students (P value<0.01). The level of good attitude of health and non-health faculty students about TB was 26.7% and 14.9%, respectively. Regarding practices, 41.9% of health faculty students and 29.8% of non-health faculty students had good practices about TB. There was a significant difference in the attitude (P value = 0.03) and practices (P value = 0.024) of health and non-health faculty students (health faculty students had better knowledge, attitude, and practices.).

Conclusion: The knowledge, attitude, and practices of health and non-health faculty students were insufficient about TB. The practice level of health faculty students was poorer than what was expected based on their field. Television and the Internet played a good role in informing students about TB. So, both can be used for transferring good knowledge, positive attitudes, and correct practices about TB to society.

Keywords: tuberculosis, students, Kabul University, Kabul University of Medical Sciences, knowledge, attitude, practice

Introduction

Tuberculosis (TB) is a severe bacterial infection of the lungs that spread through the air when a person speaks, coughs, or sneezes.[1] TB is the leading cause of death worldwide from an infectious agent;[2] the thirteenth leading cause of death and the second deadliest infectious agent after COVID-19, surpassing HIV.[3] Ending the TB epidemic by 2030 is one of the health goals of the United Nations Sustainable Development Goals (SDGs).[3] There is a significant gap between the global burden of TB and the perceived importance of addressing this burden, even in areas where TB is endemic.[4]

Each year, approximately 10 million people are diagnosed with TB, despite the fact that TB is a preventable and treatable disease. And 1.5 million people die from TB each year; making it a major infectious disease.[3] In 2021, an estimated 10.6 million cases of TB were reported, and approximately 1.6 million people died from TB that year.[3,5] Most cases of TB occur in low- and middle-income countries; however, TB exists worldwide. TB mostly affects adults in their most productive years. More than 95% of cases and deaths occur in developing countries.[6]

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According to the Global TB Report, Afghanistan is one of the countries with the highest incidence of TB in the Eastern Mediterranean Region[7] and is among the 24 countries with high TB death rates worldwide.[8] In 2020, TB killed nearly 10,000 people in Afghanistan, which was three times higher than COVID-19 deaths.[9] The incidence of TB in 2022 has increased by 3% compared to 2021 in the country.[10] The World Health Organization believes that cultural barriers, lack of knowledge and proper attitudes about TB, and security problems continue to pose serious challenges to reducing this deadly infectious disease in Afghanistan.[9]

Studies have shown that awareness and knowledge about TB and access to its services in high TB burden environments is insufficient.[11] On average, one TB patient can infect 10–15 people.[12] Timely screening and medications for TB management are essential to reduce the likelihood of infection. Drug-resistant TB is a global challenge that is growing, resulting from incorrect use and mismanagement of TB drugs due to a lack of proper knowledge about this disease.[6] Each year, approximately half a million people become resistant to multiple drugs for TB, which is expensive and complicated to treat and has potentially life-threatening side effects.[4]

Every year on March 24, world TB Day is commemorated to raise public awareness about TB and its devastating health, social and economic consequences and to raise efforts to end the global TB epidemic.[13]

No study has evaluated knowledge, attitudes, and practices regarding TB among university students in Afghanistan. This study aimed to provide an overview of the current TB knowledge, attitude and practices in two major governmental universities in Afghanistan to better understand the situation and to identify potential areas for improvement in TB prevention and control efforts. The findings of this study will provide valuable insights into the current state of knowledge, attitude, and practices among students and can be used to develop effective TB control strategies in the country.

Materials and Methods

Study Design, Setting, and Period

This cross-sectional study measured health and non-health faculty students' knowledge, attitude, and practices toward tuberculosis in two large and famous governmental universities of Afghanistan; Kabul University and Kabul University of Medical Sciences. This study was conducted between October and December 2022.

Sample Size and Sampling Method

In 2022, Kabul University and Kabul University of Medical Sciences had 20,171 students. The number of samples was calculated using a confidence interval of 95%, with an absolute error of 5% and a population proportion of 0.5 through Cochran's formula and Epi Info 7.2.5 software. The estimated sample size was 415 along with a 10% non-response bias.

We used a multi-stage stratified sampling technique in this study. The universities were first divided into two subgroups (strata), and then each university was also divided into subgroups by faculty. Proportionate share for females and males and each stratum was considered. Then, in each stratum (faculty), first, classes were randomly selected, and then within the selected class, samples (students) were also randomly selected.

Ethics

The proposal of this study was accepted and confirmed by Public Health Faculty Institutional Review Board. Participation in this study was voluntary and written informed consent to participation was obtained from all participants before participation. All data were collected and kept anonymously without identification. University policy, Afghani cultures and costume were considered completely. We maintain the welfare of research participants by doing no physical or mental harm to them.

Data Source and Measurement

Based on a review of similar studies, we developed a 35-item questionnaire divided into five sections to achieve the study objectives.[1,14,15] The questionnaire was reviewed for content validity by expert researchers and their comments were considered. The questionnaire consisted of 5 demographic questions, 19 knowledge questions, 7 attitude questions, 3 practice questions and one question about source of information of TB. The questionnaire was translated into local

languages by a professional and a pilot study of 60 participants was done prior to conducting the main research to confirm the practicability and clarity of questions.

Students' overall knowledge, attitude, and practice were categorized according to Bloom's cutoff point into good, moderate, and poor based on the total percentage score as follows: good for scores 80% and above, moderate for scores 60–79%, and poor for scores below 60%. For the knowledge questions, participants were required to answer "Yes", "No", or "Do not know". Each correct answer had a score of 1, while the answer "Do not know" had a score of 0. The maximum score for knowledge was 19, for attitude the score ranged from 4 to 16, while for practice questions, the score ranged from 1 to 3. And for the source of information, we found a percentage of each answer.

Statistical Analysis

For statistical analysis of the data collected, we used descriptive statistics: mean, standard deviation, frequency and percentage. Descriptive analysis such as frequency and percentage was used for categorical variables and for describing the demographic characteristics of the participants. Differences in participants' knowledge, attitude and practices according to participants' characteristics were analyzed using Cross-tabulation and Chi-Square test. Significance level was set at p-value <0.05.

Results

Students' Sociodemographic Characteristics

Of the 415 questionnaires, 400 questionnaires returned. Students' sociodemographic characteristics are presented in Table 1. Of all the participants, 105 (26.3%) were health faculty students, whereas 295 (73.8%) were non-health faculty students (Table 1). Participants age in this study ranged from (17–28) years with a mean of 21.32 and with a standard deviation of 1.85.

Students' Knowledge About TB

The results of this study showed that 18.1% of health faculty and 2.4% of non-health faculty students had good knowledge, 63.8% of health and 39.7% of non-health faculty students had moderate knowledge and 18.1% of health and 58% of non-health faculty students had overall poor knowledge of Tuberculosis. As might be expected, knowledge about TB among health faculty students was better than that among non-health faculty students. Additional data on students' knowledge are presented in Table 2.

According to the results of this study, 99% of health faculty students and 98.3% of non-health faculty students had heard of TB. 65.7% of health faculty students and 61% of non-health faculty students confirmed that smoking causes TB.

Table 1 Students' Sociodemographic Characteristics

Characteristics		Number (Percentage)
Sex	Female	199 (49.8%)
	Male	201 (50.2%)
Faculty	Health- faculties	105 (26.3%)
	Non-health faculties	295 (73.7%)
Residence	City	338 (84.5%)
	Village	62 (15.5%)
Year of education	1st year students	124 (31%)
	2nd year students	95 (23.8%)
	3rd year students	88 (22%)
	4th year students	93 (23.25%)

Table 2 Students' Knowledge About TB

Variables	Health Faculty Students			Non-Health Faculty Students		
	Yes n (%)	No n (%)	Do not Know n (%)	Yes n (%)	No n (%)	Do not Know n (%)
1. Have you ever heard of an illness called TB?	104 (99%)	1 (1%)	0	290 (98.3%)	3 (1%)	2 (0.7%)
2. TB can occur anywhere in the body.	55 (52.4%)	41 (39%)	9 (8.6%)	109 (36.9%)	91 (30.8%)	95 32.2%
3. What causes Tuberculosis?						
a. Cold Air	50 (47.5%)	31 (29.5%)	24 (22.9%)	178 (60.3%)	46 (15.6%)	71 (24.1%)
b. Smoking	69 (65.7%)	20 (19%)	16 (15.2%)	180 (61%)	36 (12.2%)	79 (26.8%)
c. Dust	82 (78.1%)	10 (9.5%)	13 (12.3%)	215 (72.9%)	16 (5.4%)	64 (21.7%)
4. Can TB transmit through…?						
a. Cough/breathe	99 (94.3%)	4 (3.8%)	2 (1.9%)	235 (79.6%)	29 (9.8%)	31 (10.5%)
b. Sexual contact	36 (34.3%)	49 (46.7%)	20 (19%)	119 (40.3%)	76 (25.8%)	100 (33.9%)
5. What are Symptoms of Tuberculosis?						
a. Cough for two weeks	91 (86.7%)	4 (3.8%)	10 (9.5%)	249 (84.4%)	11 (3.7%)	35 (11.9%)
b. Chest pain	98 (93.35)	3 (2.9%)	4 (3.8%)	234 (79.3%)	12 (4.1%)	49 (16.6%)
c. Weight and appetite loss	83 (79%)	12 (11.4%)	10 (9.5%)	209 (70.8%)	19 (6.4%)	67 (22.7%)
d. Night sweating	73 (69.5%)	11 (10.5%)	21 (20%)	148 (50.2%)	18 (6.1%)	129 (43.7%)
6. Is TB preventable disease?	100 (95.2%)	3 (2.9%)	2 (1.9%)	257 (87.1%)	11 (3.7%)	27 (9.2%)
7. Can TB be prevented by covering mouth while coughing?	89 (84.8%)	6 (5.7%)	10 (9.5%)	209 (70.8%)	36 (12.2%)	45 (17%)
8. Can TB be Cured?	100 (95.2%)	3 (2.9%)	2 (1.9%)	256 (86.8%)	15 (5.1%)	24 (8.1%)
9. Can TB be cured by herbal remedies?	33 (31.4%)	20 (19%)	52 (49.5%)	102 (34.6%)	57 (19.3%)	136 (46.1%)
10. Can TB be cured by home rest without treatment?	8 (7.6%)	81 (77.1%)	16 (15.2%)	42 (14.2%)	184 (62.4%)	69 (23.4%)
11. TB can only be treated if there are obvious symptoms.	48 (45.7%)	49 (46.7%)	8 (7.6%)	129 (43.7%)	88 (29.9%)	78 (26.4%)
12. Is TB treatment difficult and if anti TB drugs are not taken regularly, it can lead to drug resistance?	57 (54.3%)	19 (18.1%)	29 (27.6%)	109 (36.9%)	53 (18%)	133 (45.1%)
13. Is TB treatment free in Afghanistan?	53 (50.5%)	30 (28.6%)	22 (21%)	82 (27.8%)	108 (36.6%)	105 (35.6%)

Abbreviations: n, number of students; %, percentage.

47.5% of health faculty students and 60.3% of non-health faculty students believed that cold weather causes TB. 86.7% of health and 84.4% of non-health faculty students were informed that coughs for two weeks is a sign of TB. 95.2% of health and 86.8% of non-health faculty students confirmed that TB can be cured. 19 % of health and 19.3% of non-health

faculty students knew that TB cannot be cured by herbal remedies. Only 50.5% of health faculty students and 27.8% of non-health faculty students knew that TB treatment is free in the country (Table 2).

Students' Attitude of TB

The results of this study showed that 26.7% of health faculty students and 14.9% of non-health faculty students had good attitude, 60% of health and 61.4% of non-health faculty students had moderate attitude and 12.4% of health and 23.7% of non-health faculty students had overall poor attitude of TB. Additional data on students' attitudes are presented in Table 3.

The results of this study showed that 21.9% of health faculty students and 29.5% of non-health faculty students were unwilling to work with someone who was previously treated for TB. Sixty percent of health faculty students and 53.6% of non-health faculty students confirmed that they could also become infected with TB. Fifty-nine percent of health faculty students and 61.4% of non-health faculty students wanted a family member's TB to be kept secret. 13.3% of health faculty students and 10.2% of non-health faculty students strongly agreed with the statement that "education about TB is very much needed" (Table 3).

Table 3 Students' Attitude About TB

Variables	Health Faculty Students			Non-Health Faculty Students		
	Yes n (%)	No n (%)	Do Not Know n (%)	Yes n (%)	No n (%)	Do Not Know n (%)
Would you be willing to work with someone previously treated for TB?	72 (68.6%)	23 (21.9%)	10 (9.5%)	169 (57.3%)	87 (29.5%)	39 (13.2%)
Would you want a family member's TB to be kept secret?	62 (59%)	29 (27.6%)	14 (13.3%)	181 (61.4%)	89 (30.2%)	25 (8.5%)
Do you think you can get TB?	63 (60%)	20 (19%)	22 (21%)	158 (53.6%)	70 (23.7%)	67 (22.7%)
What would be your reaction if you found out that you have TB?						
Answers	Fear		Hopelessness	Shame	Sadness	Acceptance*
Health Faculties	8 (7.6%)		4 (3.8%)	4 (3.8%)	2 (1.9%)	87 (82.9%)
Non-Health Faculties	53 (18%)		13 (4.4%)	19 (6.4%)	24 (8.1%)	186 (63.1%)
I am interested in finding out more about TB.						
Answers	SA, n(%)		A, n(%)	DA, n(%)		SD, n(%)
Health Faculties	11 (10.5%)		83 (79%)	10 (9.5%)		1 (1%)
Non-Health Faculties	42 (14.2%)		215 (72.9%)	24 (8.1%)		14 (4.7%)
I think education about TB is very much needed.						
Answers	SA, n(%)		A, n(%)	DA, n(%)		SD, n(%)
Health Faculties	14 (13.3%)		66 (62.9%)	22 (21%)		3 (2.9%)
Non-Health Faculties	30 (10.2%)		128 (43.4%)	109 (36.9%)		28 (9.5%)
I would encourage those with TB around me to obtain treatment.						
Answers	SA, n(%)		A, n(%)	DA, n(%)		SD, n(%)
Health Faculties	24 (22.9%)		70 (66.7%)	11 (10.5%)		0
Non-Health Faculties	40 (13.6%)		198 (67.1%)	38 (12.9%)		19 (6.4%)

Note: *Acceptance and seeking health care.
Abbreviations: SA, Strongly agree; A, Agree; DA, Disagree; SD, Strongly disagree; n, number of students; %, percentage.

Students' Practices of TB

The results of this study showed that 41.9% of health faculty and 29.8% of non-health faculty students had good practices and 58.1% of health and 70.2% of non-health faculty students had overall poor practices of tuberculosis. You can see additional data on students' practices in Table 4.

The results of this study showed that 7.6% of health faculty and 27.1% of non-health faculty students went to the pharmacy if they had symptoms of TB. 22.9% of health faculty students confirmed that they will do self-treatment in case of having TB symptoms. 27.8% of non-health faculty students cited cost of the services as the reason for not seeking medical care. 34.3% of health faculty students and 34.2% of non-health faculty students confirmed that they would seek medical help if symptoms of TB lasted more than two weeks (Table 4).

Differences in Students' Knowledge, Attitude, and Practices Toward TB According to Students' Characteristics

According to the results of this study, health faculty students demonstrated greater knowledge, better attitudes, and practices toward TB than non-health faculty students ($p < 0.00$, $p = 0.003$, and $p = 0.024$ respectively). In this study, there were no significant differences in students' knowledge, attitude, and practices according to sociodemographic factors (sex and year of education). Additional data on differences in students' knowledge, attitude, and practices toward TB according to their characteristics are presented in Table 5.

Students' Source of Information About TB

13.2% of the participants in this study said that they obtained information about TB from healthcare workers, 25.5% from family and friends, 17.13% from Internet and social media, 21.22% from television, 3.32% from radio, 2.80% from posters, and 16.60% of the participants mentioned other sources.

Table 4 Students' Practices About TB

What would you do if you thought you had symptoms of TB?					
Answers	Go to a health facility	Go to a pharmacy	Go to traditional healers	self-treatment	
Health Faculties	67 (63.8%)	8 (7.6%)	6 (5.7%)	24 (22.9%)	
Non-Health Faculties	173 (58.6%)	80 (27.1%)	21 (7.1%)	21 (7.1%)	
If you had symptoms of TB, at what point would you seek medical help?					
Answers	When treatment on my own does not work	When TB symptoms last for two or more weeks	As soon as I realize TB symptoms	Don't know	
Health Faculties	14 (13.3%)	36 (34.3%)	50 (47.6%)	5 (4.8%)	
Non-Health Faculties	69 (23.4%)	101 (34.2%)	102 (34.6%)	23 (7.8%)	
If you would not go to the health facility, what is the reason?					
Answers	I didn't refuse to go to the hospital	Not sure where to go	Cost of the services	Do not trust health care workers	Can't leave my work
Health Faculties	62 (59%)	3 (2.9%)	18 (17.1%)	13 (12.4%)	9 (8.6%)
Non-Health Faculties	148 (50.2%)	15 (5.1%)	82 (27.8%)	39 (13.2%)	11 (3.7%)

Table 5 Differences in Students' Knowledge, Attitude and Practices Toward TB According to Students' Characteristics

Variables	Categories	Knowledge		Attitude		Practices	
		Level of Good Knowledge	*P value	Level of Good Attitude	P value	Level of Good Practices	P value
Faculty	Health faculties	18.1%	<0.01	27.6%	0.03	41.9%	0.024
	Non-health faculties	2.4%		14.9%		29.8%	
Sex	Female	5.5%	0.731	19.6%	0.722	31.2%	0.435
	Male	7.5%		16.9%		34.8%	
Year of education	1st year Students	3.22%	0.07	16.12%	0.871	36.2%	0.561
	2nd year Students	4.21%		16.8%		27.3%	
	3rd year Students	6.81%		22.7%		32.95%	
	4th year Students	12.9%		18.27%		34.4%	

Notes: All analyses were by chi-square-test and cross-tabulation, *Significance level was set at p-value < 0.05.

Discussion

The results of this study indicated insufficient knowledge of tuberculosis among health and non-health faculty students, with only 18.1% of health faculty students and 2.4% of non-health faculty students having good knowledge of tuberculosis. In this study, the knowledge of health faculty students was higher than non-health faculty students and a significant relationship between knowledge of tuberculosis and faculty was found ($P < 0.01$). There was no difference in knowledge based on year of education and gender. The results of this study are in complete contrast to a study conducted in Kabul in 2022 among hospital outpatients, where 87.7% of the participants had good knowledge. This difference may be due to differences in the study population, questionnaire, and measurement methods, indicating that knowledge level among students is very low and more studies are needed on this topic among different study populations in the country.[6] 50.5% of health faculty students and 27.8% of non-health faculty students in this study knew that treatment of tuberculosis is free in the country which is very low in a developing country like Afghanistan and not knowing that TB treatment is free in many cases can delay seeking health care and ultimately lead to drug-resistant TB. Therefore, raising awareness about the fact that TB treatment is free in the country is necessary.

In a study which was conducted among health and non-health faculty students in Indonesia in 2021, the average knowledge score among health and non-health faculty students was respectively, 7.03 ± 2.36 and 4.98 ± 2.20 out of 11. However, in this study, the average knowledge score in health and non-health faculty students was 12.05 ± 2.56 and 9.87 ± 2.61 out of 19, which is almost similar.[16] Also, in the study conducted in Indonesia and another study in Malaysia,[17] the knowledge of health faculty students was higher than non-health faculty students which was also observed in this study. In Indonesia, female students had good knowledge than male students, but no difference based on gender was observed in this study. In a study in Ethiopia, 35.7% of non-health faculty students had good knowledge about tuberculosis, but in this study, only 2.4% of non-health faculty students had good knowledge, showing the difference.[18] In a study in Iran, most health faculty students had moderate to good knowledge, which is contrary to the present study; this difference may be because the participants of the Iran study was only final year students.[19]

The results of this study regarding attitudes showed that most participants had moderate attitude towards tuberculosis. Health faculty students in this study had a better attitude than non-health faculty students, and this relationship was statistically significant ($P = 0.03$). In a study conducted in Iran, it was found that most health faculty students had moderate to good attitude towards TB, while in this study, 26.7% of students had a good attitude, and the most had moderate attitude. This similarity may be due to the proximity and cultural similarities of the two countries.[20] In another

study conducted in China, it was found that 89.64% of non-health faculty students had a positive attitude towards tuberculosis, in another study in Iraq, 76% of medical students had positive attitude while in the present study, only 14.9% of non-health faculty students and 26.7% of health faculty students had a positive attitude, indicating a large difference.[21,22]

Regarding the practice of tuberculosis, the results of this study showed that 41.9% of health faculty students and 29.8% of non-health faculty students had good practices, while 58.1% of health faculty students and 70.2% of non-health faculty students had poor practices of TB. These results indicate that the level of good practice in both health and non-health faculty students is inadequate. There was a significant difference in practice based on faculty ($p = 0.024$); health faculty students had better practices compared to non-health faculty students. Still practices of health faculty students are considered weak based on their field of study and regular studying and trainings in medical subjects.

There was no significant difference in practices based on year of education and gender. A study conducted in Iran showed that the practice of health faculty students regarding TB was weak, which is similar to the results of this study where 58.1% of health faculty students had poor practices of tuberculosis.[19] In another study conducted in Saudi Arabia, 59.4% of the participants had poor practices of TB, which is similar to the results of this study despite having differences in study population.[15] In the study in Saudi Arabia, 61.4% stated that they would go to a doctor if they had TB symptoms, but in this study, 60% stated that they would go to a health center.[15] In a study in Malaysia among health and non-health faculty students, most of the students said that their source of information was the Internet, while in this study 17.13% said that their source of information was the Internet and social media.[17] In this study television was a significant source of information for TB, so mass media and television programs can be used to inform people and increase knowledge of TB in the country.

The findings of this study suggest that there is a need for increased public awareness campaigns to educate individuals about TB and its transmission, symptoms and treatment. This could be achieved through various means such as mass media, community outreach programs, and health education sessions. According to the results and insufficient knowledge, attitude, and practices of TB in students, TB education can be integrated into the curriculum of health and non-health faculty students. This can help students to develop a better understanding of TB and its impact on public health.

Conclusion

According to the results of this study, the knowledge about tuberculosis in health and non-health faculty students was insufficient, but the knowledge of health faculty students was more than that of non-health faculty students ($P < 0.01$). Most of the health faculty students had moderate knowledge, but the majority of non-health faculty students had poor knowledge about TB. Regarding the attitude, most of the health and non-health faculty students had moderate attitude. There was also a significant difference in the level of attitude of health and non-health faculty students ($P = 0.03$). Regarding the practice, most of the health faculty students had poorer practices than what was expected based on their field, there was a significant difference in the practices between health and non-health faculty students ($P = 0.024$).

In conclusion, the students in this study did not have adequate knowledge, attitude and practices about TB. In this study, television, Internet and social media had made a significant contribution in transferring of knowledge about TB, which indicates that it is possible to transfer better knowledge to the society with the help of these tools and cause their attitude and practices to improve. In short, improving the knowledge, attitude and practice level of TB among students (the educated class of society) is crucial for reducing the prevalence of TB in the country. By developing educational materials, conducting awareness campaigns, integrating TB education into the curriculum, community outreach programs, social media, Internet and television, we can raise awareness about TB and prevent its spread.

Disclosure

The authors report no conflicts of interest in this work.

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