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AWARENESS OF TUBERCULOSIS AMONG THE UNDERGRADUATES OF SOUTHERN PUNJAB

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ABSTRACT

BACKGROUND: Tuberculosis TB, caused by Mycobacterium tuberculosis, is a significant health concern in Pakistan, ranking fifth globally with 510,000 new TB cases and approximately 15,000 drug-resistant TB cases emerging annually. Pakistan accounts for 61% of the TB burden in the WHO Eastern Mediterranean Region. There exists gap about knowledge of Tuberculosis, contributing to delayed diagnosis, alongside pervasive stigma. Knowledge about this disease among students of universities varies, underscoring the need for enhanced awareness in this population. **OBJECTIVE:** The objective of the study is to assess awareness of Tuberculosis among the undergraduates of Southern Punjab. **METHODS:** This Descriptive Cross Sectional study encompassed 1,384 students from six universities and seven medical colleges in South Punjab, employing convenient sampling methods. The data was collected through self-administered questionnaires covering personal, socioeconomic, knowledge-based, and perception-related aspects of Tuberculosis TB. Face-to-face interactions and an online Google Form questionnaire were used for data collection, subsequently analyzed using SPSS 2023. **RESULTS:** In this study of 1,384 undergraduate students in South Punjab, nearly half came from medical backgrounds, and the other half from non-medical disciplines. The majority fell within the 17-22 age range, and the gender distribution was almost equal. Remarkably, 96.34% of medical and 85.4% of non-medical students were familiar with tuberculosis TB. While symptoms like prolonged fever, weight loss, persistent cough, and chest pain were recognized, some misconceptions existed about fever and headache as TB symptoms. Roughly two-thirds of the students correctly understood that TB spreads through coughing and sneezing, while 19% believed it could spread through contact with objects. Preventive measures like covering the mouth and nose and avoiding spitting were noted. A significant portion believed that close contact with TB patients increased susceptibility, and a notable gender and study program influence was observed in various TB-related responses. Although there were some misconceptions, a majority believed TB to be treatable and preferred consulting a doctor if they suspected TB. TB stigma was moderate, with many students open to meeting TB-infected friends with precautions and perceiving some level of community support. **CONCLUSION:** This study highlights the awareness of Tuberculosis among South Punjab's undergraduate students. Despite misconceptions, many understand TB and its treatment. Stigma exists, but most students are open to meeting TB-infected friends with precautions. Gender and study program impact responses, suggesting the need for focused education.

KEYWORDS: Tuberculosis, Undergraduates, Knowledge Of TB, Awareness Of Tb

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INTRODUCTION

Tuberculosis TB is an infectious disease resulting from Mycobacterium tuberculosis. Pakistan exhibits a notable tuberculosis TB burden, with an annual influx of approximately 510,000 new TB cases and the emergence of roughly 15,000 drug-resistant TB cases. It holds the fifth position among high-burden countries and bears responsibility for 61% of the TB burden within the WHO Eastern Mediterranean Region. Additionally, Pakistan ranks as the fourth highest in global prevalence for multidrug-resistant TB MDR-TB[1]. South Punjab, characterized as a low-income region within Pakistan, faces a pronounced burden of Tuberculosis TB attributed to a constellation of factors. These include limited awareness and understanding of TB, suboptimal sanitary conditions, and a predominantly low socioeconomic status among its population. A study conducted in South Punjab provides significant data favoring low socioeconomic status, low level of knowledge, unemployment and unawareness of disease are major causes of low compliance among

TB patients[2]. According to WHO, one of the reasons for late diagnosis of disease among the community is lack of knowledge about TB [3]. Besides the low level of knowledge on TB disease, stigma is also one of the factors that cause a delay in diagnosing TB disease4. Numerous studies have undertaken the task of evaluating the depth of knowledge and awareness about TB among student populations. In a particular study conducted in Italy, it was discerned that the level of TB knowledge among undergraduate healthcare students was deemed sufficient[5]. Conversely, in a study carried out in China, it was ascertained that the level of tuberculosis TB knowledge among medical students was deficient.[6] In Pakistan, research pertaining to this area has been relatively scarce. Findings from existing studies indicate a lack of sufficient tuberculosis TB knowledge and awareness among undergraduate students, notably those outside the healthcare discipline. The majority of investigations focused on gauging perceptions of TB within the broader community, leaving a notable gap in our understanding of the nexus between TB knowledge, awareness, and attitudes specifically among university students[7,8]. The surge in tuberculosis TB cases prompts an important inquiry into the extent to which the community is arming itself with TB knowledge, raising awareness about the disease, and cultivating positive perceptions regarding TB. Consequently, there remains a dearth of substantial findings illustrating a definitive link between the level of knowledge and the perception of university students regarding TB disease. This study, therefore, aims to delve into the intricate relationship between the depth of knowledge about TB disease and the perceptions held by individuals towards TB within the student population of medical and non-medical institutions.

Materials and Methods:

This Descriptive Cross-Sectional study was conducted among students of 6 universities and 7 medical colleges of South Punjab. Keeping total population of students 300,000, a total of 1384 study subjects, meeting the inclusion/exclusion criteria, were included in the study. Convenient sampling technique was used to collect data. All undergraduates of medical colleges and universities were included while Students of Pre Medical, Pre Engineering, I.Com, and ICS, and Post Graduates were excluded.

Questionnaire and Data Collection

A self-administered questionnaire was used which consisted of three categories i.e. personal and socioeconomic data, knowledge based questions and perception towards TB. Prior to inclusion, consent was taken, and Performa was filled after face-to-face interaction with students to assess the knowledge, attitude and perception about Tuberculosis. An online google form questionnaire was spread among class groups and university groups and data was collected in Google sheet which was transferred into SPSS for analysis purposes.

DATA ANALYSIS:

Data analysis was done through a software SPSS 2023 which contained statistical as well as graphical explanations. The data collected through questionnaires was entered in and analyzed by SPSS version-23. Quantitative variables like age, sex, marital status were presented in terms of mean ± standard deviation S.D while, frequencies and percentages were calculated for qualitative variables like knowledge, attitude and perceptions. Moreover, effect modifiers like age, sex and marital status class were controlled through stratification. Then, post-stratification Chi-Square test was applied, taking p-value <0.05 as significant.

Outcome: Results would be helpful in determining the knowledge of tuberculosis among undergraduates of South Punjab. Furthermore, results would also be helpful to assess attitudes and perception towards Tuberculosis.

Ethical Consideration: Ethical consideration was taken from Institutional Review Board Committee of Sheikh Zayed Medical College, RYK. All data collected during the study were handled with the utmost confidentiality. Participation in the research was entirely voluntary, and prior to their engagement, participants were provided with comprehensive information about the study's objectives. Subsequently, informed consent was obtained from each participant at the commencement of the questionnaire. This process included a detailed explanation of the study's purpose and nature. Participants were then invited to complete an anonymous questionnaire, ensuring their privacy and anonymity throughout the research process.

RESULTS

1384 undergraduate students participated in our study which were categorized into medical and non-medical students i.e. 684 49.4% and 700 50.6% respectively. Out of 1384 students,

81.4% students were between 17-22 years of age while remaining 18.6% were between 23-27 years. In our study, 54.6% respondents were male and 45.4

% respondents were female. Assessing the knowledge of TB, 96.34% of medical students were familiar with term Tuberculosis and among non-medical students 85.4% students were familiar. Table 1.1

About 33% of medical and 26.8% of non-medical students selected fever for more than 7 days, 46.4% 0f medical and 39.1% of non-medical selected Weight loss, 58.1% of medical while 50.8% of non-medical students chose cough more than 2 weeks, and about equal percentage of medical and non-medical students 33% selected Chest pain correctly as symptoms of Tuberculosis. While 35.6 % of Medical and 26.2% of non-medical students selected only fever wrongly selected as a symptom of Tuberculosis. Headache was chosen by 17.5% medical and 14.8% non-medical students which is not a symptom of TB. Table 1.2

Majority of the students 67% including medical 63.1% and non-medical 72.5% students correctly answered the spread of TB through coughing and sneezing. However, almost 19% of students of each group selected touching items as cause of

spread of TB. Further data is given in tabulated form given below. Table 1.3

Interestingly 65.1% of medical and 68.2% of non-medical students answered the prevention through covering mouth and nose, however, 37.5

% of medical and 34.7% of non-medical considered avoid spitting. There is almost equal percentage 6.7

% of both medical and nonmedical students of praying as preventive measure of Tuberculosis. While percentages of other variables i.e. avoid bed sharing, avoid dish sharing, shaking hands, closing windows and washing hands after touching public places are given below in tabulated form. Table 1.4

Most of the medical students 42.1% considered people living with TB patients are more prone to TB infection on the other hand 37% non-medical students agreed on this. 33.4% of medical students thought anybody can get TB infection while 50.2% of non-medical students had same opinion. Least selected option were Madrassa students Medical, 12.7%; Non-medical, 5.8% and Prisoners Medical, 20.7%; Non-medical, 6.7%. Table 1.5

Table 1

Variables	Medical Students	Non-Medical Students
Have you Heard of Tuberculosis 1.1	659 96.34%	598 85.4%
Symptoms of Tuberculosis 1.2		
a Chest Pain	250 36.5%	233 33.2%
b Shortness of Breath	307 44.9%	272 38.8%
c Fever	244 35.6%	184 26.2%
d Fever more than 7 days	229 33%	180 25.7%
e Weight Loss	318 46.4%	274 39.1%
f Severe Headache	120 17.5%	104 14.8%
g Cough	239 35%	226 32.2%
h Cough with Blood	293 42.8%	261 37.2%
i Cough more than 2 weeks	398 58.1%	356 50.8%
j Any other	20 2.9%	28 4%
Spread of Tuberculosis 1.3		
a Air droplets i.e. coughing sneezing	432 63.1%	508 72.5%
b Eating from same plate	134 19.5%	115 16.4%
c Sharing bed	206 30.1%	102 14.5%
d Hand Shake	129 18.8%	79 11.2%
e Touching Items	133 19.4%	131 18.7%
f Spitting	236 34.5%	165 23.5%
g Don't know	63 9.2%	79 11.2%
Prevention of Tuberculosis 1.4		
a Avoid Shaking Hands	104 15.2%	127 18.1%
b Covering mouth and nose	445 65.1%	478 68.2%
c Avoid sneezing and coughing	204 29.8%	179 25.5%
d Avoid sharing bed	262 38.3%	197 28.1%
e Avoid sharing dishes	74 10.8%	86 12.2%
f Washing hands after touching public place	109 15.9%	64 9.1%
g Closing windows at home	174 25.4%	153 21.8%
h Good Nutrition	98 14.3%	106 15.1%
i Praying	46 6.7%	47 6.7%
j Avoid spitting	257 37.5%	243 34.7%
Opinion who can infected with TB 1.5		
a Any body	229 33.4%	352 50.2%
b Immunocompromised	210 30.7%	128 18.2%
c Drug users	150 21.9%	115 16.4%
d Prisoners	142 20.7%	47 6.7%
e Living with TB patients	291 42.1%	259 37%
f Madrassa Students	87 12.7%	38 5.4%
g HIV Patients	223 32.6%	131 18.7%
h Smoker	211 30.8%	197 28.1%

i Homeless	136 19.8%	63 9%
j Poor people	208 30.4%	99 14.1%

On a question, can TB be treated, 86.4% of medical and 84.7% 0f non-medical students correctly answered Yes while remaining 13.6% and 15.7% of medical and non-medical respectively answered No or Don't know. Of medical 59.9%, 18.7%, 8.18% and 13.1 selected Government Hospital, Private Hospital, private Clinic and Home respectively as place of treatment. While among non-medical students 55.7%, 29.7%, 6.2% and 8.2% selected Government Hospital, Private Hospital, private Clinic and Home respectively as place of treatment. Sputum as a diagnostic test was selected by 63% medical and 44.7
% non-medical students. While other options like chest X-ray and Blood test were selected by 26.3% and 8.6% medical students respectively, 27.5% and 27.7% non-medical students respectively.

Perspective and Attitude

Describing the seriousness of disease 40.2% of students considered it fatal, 37.7% chose very serious, and 19.6% and 2.5% of students considered it serious and mild respectively. Asking the Health seeking behavior, most of the students 67.3% prioritized to talk to Doctor while 10.3% to parents, 5.8% to spouse, 1.7% to their children, 6.2 to other family members, 4.8% to close friends and 4% to no one.

Discussing the Stigma of TB, response towards close TB friend, 91.7% of students opted to meet with precautions, 9.8% students were in favor of stop meeting and 10.7% students said their behavior will not change towards TB patients. In another question, response of community towards TB patients, 50% of respondents said people are friendly but they try to avoid, 24.8% of respondents selected the total rejection of TB patients, and 25.1
% respondents answered that community supports and helps TB patients.

Associations

We couldn't find any association between residency area and if close friend is infected with TB as P-value is greater than 0.05 Table 2.1. In our results there is significant association between responses of community towards TB patients and residency area P-value<0.05 Table 2.2. There is significant association between gender and whom to talk Table 2.3. There is positive association between Gender of respondent and Response of community towards TB patients Table 2.4. We found another association between study program and response towards TB patients with significant p-value of 0.002 Table 2.5.

Table 2

Association of Residential area and response towards TB patients 2.1

		Residential Area		
		Urban	Rural	Total
Your Response Towards TB	Stop Meeting	83	52	135
	No Change	89	58	147
	Meet with precautions	679	308	987
	Don't Know	65	46	111
Total		919	465	1384
Pearson Chi-Square		**Value**	**df**	**p-value**
		9.825	**5**	**o.o8**

Association of Residential area and Response of community towards TB patients 2.2

		Residential Area		Total
		Urban	Rural	
Response of Community	Rejection	205	138	343
	Avoidance	475	217	692
	Support or Help	239	109	348
Total		919	465	1384
		Value	**df**	**p-value**
Pearson Chi-Square		**17.076**	**3**	**.011**

Association of Gender and whom to talk 2.3

	Gender of Respondent		Total
	Male	Female	

Who would you talk	Doctor	514	417	931
	Spouse	32	48	80
	Parent	73	70	143
	children	12	11	23
	other Family member	54	32	86
	Close Friend	35	31	66
	No one	36	19	55
Total		756	628	1384
		Value	**df**	**p-value**
Pearson Chi-Square		**12.809**	**6**	**.046**

Association of Gender and Response of community towards TB patients 2.4

		Gender of Respondent		Total
		Male	Female	
Response of Community	Rejection	214	129	343
	Avoidance	377	315	692
	Support or Help	164	184	348
Total		756	628	1384
		Value	**df**	**p-value**
Pearson Chi-Square		**17.076**	**3**	**.001**

Association of Study program with response towards TB patients 2.5

		Study Program		Total
		Medical	Other Than Medical	
Your Response Towards TB	Stop Meeting	65	70	135
	No Change	53	94	147
	Meet with precautions	519	468	987
	Don't Know	45	66	111
Total		684	700	1384
		Value	df	p-value
Pearson Chi-Square		19.380	5	.002

DISCUSSIONS

Infectious disease is major challenge to health care system. Controlling infectious disease require multidisciplinary approach including eliminating potential exposure, engineering or environmental control administrative control, education and awareness of public. TB is the second leading infectious killer after covid 19 and killed 1.6 million people in 2021. (WHO) This study was conducted to assess the knowledge, attitudes and perceptions about TB in medical and non-medical university students. According to our study, most of students were familiar about term TB. For symptomatology, as expected, medical students have more knowledge than non-medical students. However, interestingly17.5% medical and 14.8% non-medical students selected headache and fever only which are not symptoms of TB. Our results are in accordance with other studies conducted to compare the knowledge of TB among university students of Italian University. (Maria Teresa Montagna, Christian Napoli, Silvio Tafuri, Antonella Agodi, Francesco Auxilia, Beatrice Casini, Maria Franca Coscia, 2014)

About the spread of disease, a large number of students about 67 percent were familiar about mode of transmission i.e. air droplet spread coughing and sneezing. Quoting a study conducted in Nepal which shows knowledge about communicable nature of disease and transmission of disease among undergraduates is very high about 89.7%. The difference is due to the reason that participants of research in Nepal were medical students only.[11] About prevention of disease, surprisingly, almost

equal percentage of medical and nonmedical students correctly answered that covering mouth and nose and avoid spitting can prevent TB. Some students said praying only can prevent TB. This is due to their religious beliefs[12]. About 50 % of non-medical students think anybody can get TB while 34 % medics think so. While 42% of medical students think people living with TB patients are more prone to get TB than others. About 20 % medical students think homeless people are more prone to get TB. A study conducted in US depicts that homeless people have 10 fold increase TB incidence[13]. The result may differ due to the cultural diversity among two nations.

About the diagnosis of TB, large percentage of students 63% medical and 44.7% nonmedical students believe that sputum culture is a diagnostic test for TB. Other options like blood test was selected by nonmedical student while chest X ray was selected by medical students. There is big difference between our results and a study conducted in Hunan, China which states only 35.7% final year medical students have correct knowledge about diagnosis of TB. Reason may be limited clinical exposure and curriculum in China[14]. About the treatment majority of participants were agreed that it is a curable disease almost 85%. On a question about place of treatment 60 % medical and 55 % non-medical students answered Govt. hospitals. A study conducted in Iran shows that about 97% of participants think TB can be cured. The results are comparable as participants in study of Iran were only final year medical students.[15]

Discussing the attitudes and perspective about TB, majority of participants 78% believed that TB is a fatal or very serious disease. It may be due to the fact that high mortality rate in Pakistan is due to late diagnosis of TB and poor compliance of patients to medication. A study conducted on TB patients in Kenya states that TB patients have knowledge that TB is serious but curable with proper adherence to long term medication[16]. Discussing the health seeking behavior, we have found that only 67% participants would like to talk to doctor for medical advice. It is satisfactory but not good. It is in accordance with a narrative review from all over the world which states that students in every two of six studies have negative attitude and only 11.6% have poor practices towards TB [17].

Discussing an important aspect towards TB control, stigma and myths related with TB, we have asked question if participant's friend get TB, what will be their behavior. Answering this 90% said they will meet with precaution. Only 10%answered they will stop meeting. Another study conducted in Pakistan stated that 74%participants felt uncomfortable with TB patients and 41 % said there will be no gathering with TB friends[18]. This difference is due to the participants of study. We had undergraduates who had good knowledge about TB prevention. Participants in previous study was general public unaware of preventive measures. Social isolation is common in TB patients. To know about behavior of community towards TB patients almost one fourth of participants thought community is supportive and helping. Other think community give total rejection or avoidance. A study conducted in Ethiopia states that 50% participants believe that community is supporting and to TB patients while only 3% participants think community give rejection and avoidance[19]. Social and cultural norms may be the reason behind the difference in results.

We found an association p-value= 0.001 of gender and response of community towards TB patients in which females are more supportive and less avoiding TB patients as compare to males clearly showing Carefulness of female gender. Irma et al conducted the same study among university students of Indonesia which showed the same results[20].

LIMITATIONS

This study possesses certain limitations that warrant acknowledgment. Firstly, an accurate determination of the response rate proved challenging due to the distribution method of the questionnaire, which relied on online student communication channels. Secondly, given the multi-university nature of this study, we had to resort to an open platform for online forms. Despite our efforts to restrict access to the survey to the intended student population, accomplished by utilizing secured communication channels exclusively accessible to individuals with verified email addresses, it is essential to acknowledge the potential for external parties, who do not meet the student criteria, to access the survey through external links. However, we maintain confidence in the effectiveness of our precautions to minimize this possibility. Third limitation may be, as we conducting the study among undergraduates of Southern Punjab, but universities and medical college of selected region may have students from other areas of Punjab and even from other Provinces of Pakistan which may accounts for sampling biased.

CONCLUSION

This study provides valuable insights into the awareness of tuberculosis TB among undergraduate students in South Punjab, encompassing both medical and non-medical backgrounds. While a substantial proportion of students, including medical and non-medical, demonstrated familiarity with TB, the research highlights the persistence of misconceptions, particularly regarding TB symptoms. The study also underscores a prevalent yet varying degree of stigma associated with TB among both groups, emphasizing the need for targeted awareness campaigns to combat this issue. On a positive note, the majority of students from both medical and non-medical backgrounds recognized TB as a treatable disease, with a preference for consulting medical professionals, indicating a willingness to seek timely medical attention. Additionally, the associations identified among gender, study program, and responses to TB-related questions further emphasize the importance of tailoring educational interventions to address specific knowledge gaps and attitudes among both medical and non-medical students.

Recommendations

Assessment of knowledge from the students of South Punjab is great tool to initiate Tuberculosis awareness programs by Government of Pakistan.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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CONFLICT OF INTEREST: No competing interest declared.

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