Assessment of Tuberculosis Related Knowledge, Attitude and Practices Among Final Year Medical Students in Karachi

Muhammad Zafar Iqbal Hydrie[1], Syed Imtiaz Ahmed Jafry[2], Syed Muhammad Zulfiqar Hyder Naqvi[3], Haider Ali[4], Shazia Sarwat Iqbal[5]

Abstract

Objective: To assess tuberculosis related knowledge, attitude and practice among final year medical students of Karachi.

Methods: A cross-sectional study was conducted in two medical colleges located in different districts of Karachi from January 2017 to June 2017. Being a final year medical student of the college was the inclusion criterion whereas refusal to give written informed consent was the exclusion criterion of the study. Data were collected on a structured questionnaire administered by the principal investigator to all the participants. Data collected were analyzed using SPSS statistical package version 20.

Results: Around two-thirds students knew that tuberculosis cannot be treated only on radiographic findings while a majority of them knew about the treatment regimens but knowledge about the different TB medicines and their side effects was variable. About 90% of the students believed that directly observed treatment short course therapy is effective while a similar number believed Bacille Calmette Guerin vaccination prevents tuberculosis. A fair number of students (63.1%) practice wearing of face mask while a majority (89.3%) of them reported that contagious patients should be isolated. Over 95% of the students stated that they give tuberculosis patients counseling and health education.

Conclusion: Majority of students had correct knowledge, attitude and practices regarding tuberculosis. Increased exposure and education to medical students in both academic and clinical settings is recommended.

Keywords: Knowledge, Attitude, Tuberculosis, Students, Medical

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Introduction

Tuberculosis (TB) remains a crucial public health problem worldwide with around 1.6 million deaths annually especially in low and middle-income countries according to the WHO Global TB Report 2018[1]. The Global TB Report 2018 published by the WHO reported that TB caused an estimated 1.3 million deaths (range, 1.2-1.4 million) among HIV-negative people and an additional 300 000 deaths from TB (range, 266 000-335 000) among HIV-positive people, thus making TB the disease ranked as the leading cause of death from a single infectious agent above HIV/AIDS[1]. Globally, the number of TB deaths has decreased 29% since 2000, being 1.8 million in the year 2000 to become 1.3 million in the year 2017, using strategies aimed at prevention and control of the tuberculosis such as the directly observed treatment short-course (DOTS) and stop TB strategy etc.[1-3]. The best esti-

[1-3]Department of Community Medicine, Baqai Medical University
[4]Department of Nursing, Kharadar General Hospital
[5]Department of Community Dentistry, Karachi Medical and Dental College

Correspondence: Dr. Shazia Sarwat Iqbal
Department of Community Dentistry,
Karachi Medical and Dental College
Email: drshaziaiqbal54@gmail.com
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mates for TB incidence put the number of people developing tuberculosis in 2017 at 10 million; of these two thirds were in eight countries, including Pakistan (5%)[3]. These eight along with 22 other countries in WHO list of 30 high TB burden countries account for 87% of the world's cases[1]. The Global TB report ranks Pakistan as 5th amongst the top 30 countries with highest burden of tuberculosis, accounting for 61% of it in the Eastern Mediterranean Region of WHO[1]. Recently WHO launched an initiative called Find, Treat, All in order to aid countries in better managing the detection and treatment of TB by treating 40 million tuberculosis patients between 2018 and 2022[4].

In Pakistan the National Tuberculosis Control Program (NTP) adopted the WHO launched Directly Observed Treatment Short Course (DOTS) in 1995 while tuberculosis was declared a national emergency in 2001; in India an assessment of knowledge of Revised National Tuberculosis Control Program (RNTCP) and attitude to tuberculosis comparison between medical students and interns[5]. According to latest figures an estimated 525,000 new TB cases have been identified in Pakistan annually, with over 368,589 cases under treatment and as many as 160,000 patients missing treatment with 56,000 deaths occurring due to TB every year1. At the same time due to rising antibiotic resistance multiple drug-resistant tuberculosis (MDR-TB) infections are increasing globally[1]. According to the Global TB Report 2018 it is estimated that Pakistan has the fourth highest prevalence of multidrug-resistant tuberculosis (MDR-TB) globally[1].

Over the passage of time, instead of inpatient setting, the outpatient department has now become the focus of treatment and prevention of TB and studies on TB has shown that diagnostic delay in such scenarios is related to competency of healthcare personnel, including insufficient knowledge, inability to prescribe a smear test or to refer suspected cases to designated dispensaries or hospitals necessary management and care[6-8]. Thus health care professionals need to have adequate knowledge and practice for proper management of such patients[9]. In this context, as medical students are potential future physicians and healthcare providers, they need knowledge of etiology, transmission, screening and proper management of tuberculosis to be able to effectively prevent, diagnose and treat it[10]. Thus knowledge and undergraduate training about TB among medical students should be strengthenedsince students face significantly frequent TB exposures and consequently are at higher risk of infection[11].

To achieve the End TB Strategy milestones for 2020 and 2025, the incidence of tuberculosis should continue to fall at 10% per year by the year 2025, and the proportion of people who die from TB should fall to 6.5% by the year 2025[1]. However, this will only be possible if future doctors have adequate knowledge about TB diagnosis and management, which will impact TB control causing these milestones to be achieved. Although TB health education in medical schools is emphasized at all times, researchers unfortunately found that TB knowledge and practices among medical students was generally inadequate and several studies done previously in medical students and interns have shown that TB knowledge and practices is generally poor[12-16]. In view of this situation a need was felt to assess whether medical students have adequate knowledge, attitudes, and practices involving transmission, diagnosis, treatment and management of tuberculosis in order to identify the existing gaps and rectify them. A cross-sectional study was therefore carried out to assess tuberculosis related knowledge, attitude and practice among final year medical students of Karachi.

Materials and Methods

A cross-sectional study was carried out in two medical colleges located in different districts of Karachi during a six-month period from January 2017 to June 2017. Ethical clearance was obtained from the Departmental Research Committee, Baqai Institute of Health Sciences. Taking the percentage frequency of the outcome variable to be 50%, with 95% confidence interval and 9% precision, the mini-

mum required sample size was calculated to be 119 participants. One medical college each from Malir and Karachi South districts was randomly selected namely Baqai Medical College and Shaheed Mohtarma Benazir Bhutto Medical College, respectively. The inclusion criterion of the study was being a final year medical student of the college whereas refusal to give written informed consent was taken as exclusion from the study. After checking eligibility and taking written informed consent, each final year student was given a structured questionnaire by the principal investigator. The questionnaire was anonymous and consisted of four sections; one for demographic questions, second for knowledge, third for attitude, and fourth for practice related questions regarding TB. Knowledge was assessed with 25 questions on general knowledge, transmission, diagnosis and treatment of TB, while attitude was assessed with 13 and practice with 10 items. Study variables included knowledge, perception and practice of DOTs regimen including diagnosis, treatment and management of TB. Data collected were analyzed using SPSS statistical package version 20 after data cleaning, and ensuring data validity through random checks. Descriptive analysis was performed by calculating frequencies and percentages for the study variables.

Results

A total of 122 final year medical students were interviewed with a response rate of 100%. There was a predominance of female students (n=84, 68.9%). Though the majority of medical students had good attitude and practices about tuberculosis but their knowledge in some instances was incorrect.

Table-1 shows correct answers to knowledge questions about TB among final-year medical students. Knowledge of most of them was good, approximately all of them knew what causes TB, while around two-thirds knew that TB cannot be treated based on radiographic findings alone, and a similar number knew how the disease is transmitted, while 90% knew that BCG vaccination is given at birth to prevent tuberculosis. Majority of them knew about the treatment regimens but knowledge about the different TB medicines was variable. As far as knowledge about side effects of TB drugs is concerned 91.4% of medical students in this study identified hearing loss is a side effect of TB treatment. Overall 64% students were of the opinion that pregnant women should take TB medicine while 86% of them believed that patients with HIV infection are more prone to develop tuberculosis. Moreover, nearly 90% students identified the common sign and symptoms of TB.

Table-2 shows the attitude of final-year medical students about TB, with more than 90% of students reporting TB to be curable while similar number of students believed that regular medications makes the patients symptom free but if he does not take his medicines properly, he can spread the disease to others. Less than half (46.7%) students were of the opinion that latent TB should be isolated. About 90% of the students believed that DOTS therapy is effective treatment and 79.5% of students thought that if a TB patient does not take medicine properly he will develop MDR-TB. Ninety percent of medical students thought that DOTS is effective treatment for TB with 91% students agreeing to give TB treatment under supervision. Over half (50.8%) of the students were of the opinion that hemoptysis does not occur in Latent TB while 79.5% medical students thought that X-ray chest is the first choice of investigation in TB. Nearly 74.6% students were of the opinion that unfortunately people hate TB patients while 86.9% thought incorrectly that a family member can be a DOTS provider. Only half (54.1%) students identified nail clubbing as a sign of TB while over 89.5% thought that BCG vaccine can be used as a preventive measure.

Table 3 shows that 63.1% of the students wore a face mask; around 63.1% students performed a physical examination of the patient for TB confirmation while 91.8% medical students performed a clinical test for the diagnosis of TB. More than 91.8% medical students advised their TB patients

Table 1. Correct answers to knowledge questions about tuberculosis

Knowledge Questions (n=122)	Frequency (%)
Tuberculosis is caused by	118 (96.7)
Which type of tuberculosis spreads due to animal	95 (77.9)
Which type of tuberculosis cannot spread to others	76 (62.3)
Tuberculosis transmission	90 (73.8)
Most effective method for diagnosis of tuberculosis	87 (71.3)
How many samples are required for confirmation of proper TB diagnosis	28 (23.0)
BCG vaccine given at what time as per EPI	109 (89.3)
PCR stands for	114 (93.4)
Which test confirmed by DNA resistance to rifampicin	61 (50.0)
The duration of tuberculosis treatment is	40 (32.8)
Time duration minimized by which drug in the introduction of tuberculosis	16 (13.1)
Which tuberculosis medicine used as chemoprophylaxis	48 (39.3)
Ethambutol replace by	81 (66.4)
Which tuberculosis medicine used in category 1 intensive phase (first 2 months)	99 (81.1)
Which tuberculosis medicine used in category 1 continuation phase	77 (63.1)
Which tuberculosis medicine used in category 2 intensive phase (first 3 months)	75 (61.5)
Which tuberculosis medicine used in category 2 continuation phase	25 (20.5)
Names of first line drugs of tuberculosis	83 (68.0)
Names of Second line drugs of tuberculosis	48 (39.3)
DOTS stand for	71 (58.2)
XDR-TB stands for	77 (63.1)
MDR-TB stands for	92 (75.4)
Can a pregnant woman take tuberculosis medicine	79 (64.8)
Does HIV/AIDS make a person more vulnerable to tuberculosis	105 (86.1)
Fever, night sweat, weight loss are common sign and symptoms of tuberculosis	109 (89.3)

Table 2. Correct answers to attitude questions about tuberculosis

Attitude Questions (n=122)	Frequency (%)
Do you think that tuberculosis is curable?	111 (91.0)
Do you think that if a patient does not take regular anti Tuberculosis medicines he can spread it to others?	108 (88.5)
Do you think that if a patient takes regular anti Tuberculosis medicine then his/her symptoms will disappear?	111 (91.0)
Do you think that a Latent TB patient should be isolated?	57 (46.7)
Do you think that if a patient does not take proper anti TB medicine he/she can develop MDR-TB?	97 (79.5)
Do you think that DOTS is effective for treating tuberculosis?	110 (90.2)
Do you think that tuberculosis treatment should be under supervision?	111 (91.0)
Do you think that hemoptysis occurs in Latent TB?	60 (49.2)
Do you think that x-ray chest is the first choice of investigation in tuberculosis?	97 (79.5)
Do you think that people hate a tuberculosis patient?	91 (74.6)
Do you think that a family member can be a DOTS provider?	106 (86.9)
Do you think that nail clubbing occurs in tuberculosis?	66 (54.1)
Do you think that BCG vaccine should be used as a preventive measure?	108 (89.5)

Table 3. Correct answers to practice questions about tuberculosis

PracticeQuestions (n=122)	Frequency (%)
Do you wear N95 facemask when you attend a TB patient?	77 (63.1)
Do you perform physical examination for the confirmation of tuberculosis?	77 (63.1)
Do you perform clinical test for the diagnosis of TB?	112 (91.8)
TB patient follow-up weekly 1st two months?	112 (91.8)
Do you counseling and health education about tuberculosis?	116 (95.1)
Do you advise isolated TB patient from other peoples if active?	109 (89.3)
Do you advise TB patient take your medicine at same time every day before the breakfast?	107 (87.7)
Do advise TB patient after taking medicine brush your teeth?	90 (73,8)
Do you advise when you taking medicine marked calendar on the daily basis?	112 (91.8)
Do you advise when you forget your pills informed to health care provider?	111 (91.0)

to follow-up weekly for the first 2 months and 95.1% counseled them and gave health education. Majority (89.3%) of them reported that contagious patients should be isolated. With regards to medication 87.7% students advised TB patient to take medicine at same time every day before breakfast and 73.8% asked patients to brush after taking medicine. Almost all (91.8%) of final year medical students thought that TB patients should use a marked daily calendar when taking medicines while 91% advised the patients to inform the health care provider if they forget to take their medications.

Discussion

This study assesses the knowledge of final year medical students in two medical colleges about the etiology, transmission, diagnosis and management of tuberculosis, while perception and practice of TB diagnosis, treatment and management was also evaluated. The study questionnaire was devised after a thorough literature review with the objective of comprehensively assessing all domains of tuberculosis so as to evaluate students better than previous similar studies with limited set of questions.

Overall knowledge of how TB is caused, the infectious nature of the disease and how it is transmitted, signs and symptoms for better diagnosis was high. Knowledge of treatment regimens and drugs used in Category I and Category II as well as of multiple drug-resistant tuberculosis (MDR-TB) among the final year medical students were variable. In the early 2000's students received TB education essentially from lectures and medical students did not get chance to be updated about the changes taking place in treatment globally such as change in regimen duration from 9 months to 6 months etc. More recently medical education has emphasized on discussion of National Guidelines available in all disease spectrum to keep the medical students abreast with updated knowledge. Thus when they encounter TB patients in the outpatient clinic and at the infectious disease ward in the teaching hospital, they are geared up with the most recent updated information. It seems that the combination of updated lectures on TB and the encounters with patients establishes sufficient general knowledge and attitudes about TB.

More than 90% of the students in this study knew how TB is caused which was also seen in other studies done in the region[8,17]. Knowledge about TB transmission was known by two third students but other studies have shown that over 90% students knew how TB spreads and is caused by airborne droplet and droplet infection compared to 87% general practitioners and 96% medical interns in other studies done in Pakistan[5,8,17,18]. Similar knowledge of how TB is diagnosed was seen in other studies done in the region but few studies done Pakistan and Nigeria showed less than half final year medical students having diagnostic knowledge about TB[5,8,14,17]. Regarding number of AFB samples required for confirmation of TB as per new guidelines of National Tuberculosis Control program Pakistan only a quarter answered correctly similar to another study done in Pakistan which reported 40% while studies in the region reported over 90% correct response[5,10,18,19].

Around 90% of students had good knowledge of BCG vaccine and knew it should be given at birth compared to only a quarter of students in a Chinese study[16]. Knowledge about TB medicines was very variable with only 13.1% students knowing that time duration of treatment was minimized by rifampicin at one end while 66.4% knowing that ethambutol is replaced by Streptomycin at the other end. Over 60% final year students in this study knew what TB medicines are used in category I and II, which was similar to other studies done in Pakistan(56.5%) in medical interns and in India (85%), while a study in Nigeria reported a much lower frequency (46.1%)[14,17,18]. In this study 68% medical students identified the first line drugs for TB, similar to what was seen in an Indian study but only 39.3% were able to identify second line TB drugs while a study in Iran reported much higher percentage (63%) and a Indian study reported a

much lower (18%) number of medical students correctly identifying second line of TB drugs[8,17].

Over half (58.2%) of medical students in this study knew what DOTS stood for and this was much lower than reported in other studies done in Lahore (84%), Chennai (85%) and Delhi (100%)[17,19,20]. Knowledge about XDR-TB and MDR-TB was known by 63.1% and 75.4% of medical students compared to similar results of 58.8% and 96.4% interns in another study done in India while studies done in Pakistan reported less than 40% students having knowledge of MDR-TB[20,21]. More than half (64.8%) of the students were of the opinion that pregnant women should take TB medicine which is higher than seen in a Chinese study while 86% thought that HIV/AIDS makes a person more vulnerable to TB in this study comparable to a study done in Iran[8,10]. Majority (89.3%) of the medical students in this study were able to identify the common sign and symptoms of TB similar to what was seen in studies done in Iran (97.2%), China (97.6%) and medical interns in India (92.2%)[8,17,21].

Looking at attitude scores 91% of medical students thought that TB is curable while a greater number identified TB to be curable in study done in Iran (97.2%)[8]. A higher number of students correctly identified that if a TB patient does not take regular TB medicine, he can spread it to others in this study (88.5%) compared to a study done in Chennai (67%)[17]. Similar results were seen in an earlier study done in Iran (58.4%) where studentsthoughtthat a TB patient should be kept isolated[8]. Two third medical students were of the opinion that if TB patient does not take proper medicine, they will develop MDR-TB; a similar response was seen in a study in Chennai[17]. In this and other studies around 90% students were of the opinion that DOTS is effective treatment of TB[18,19]. Over 91% medical students think TB treatment should be under supervision and similar findings were seen in an Indian study (93.1%)[17]. Chest X-ray was the first choice of investigation in majority of studies done with only the study done in Nigeria reporting a quarter as answering correctly (35.2%)[10,11,14].

Regarding practice of using N95 mask when seeing a TB patient, around 63.1% final year medical graduates used it compared to only 17% students in an Indian study while another study reported a higher number (86%)[5,10]. Patient counseling and health education about TB was done by almost all students (95.1%) in this study while 89.3% isolated TB patient from other peoples if actively involved in community, similar to what was seen in India (93.1%)[17].

Conclusion

A majority of students had correct knowledge, attitude and practices regarding many aspects of tuberculosis, though some of the questions asked were correctly answered by a smaller percentage of students.

Recommendation

Increased exposure and education for medical students in both academic and clinical settings should be implemented and updated National Tuberculosis Control Program (NTP) guidelines added to medical curriculum. This will create increased awareness about tuberculosis management among the future physicians which is needed to make right diagnosis at the right time with right medication.

Conflict of Interests

Authors have no conflict of interests and received no grant/funding from any organization.

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