Knowledge, attitude and practice regarding tuberculosis management among final year students of two medical colleges of Karachi

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HA SIAJ conceived idea, MZIH and MAS drafted the study, HA collected data, HA SMZHN did statistical analysis & interpretation of data, SIAJ MZIH SMZHN critically reviewed manuscript, all approved final version to be published.

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The Authors declares that there is no conflict of interest.

Abstract

Background: Tuberculosis (TB) is one of the most common infectious diseases caused by mycobacterium tuberculosis and continues to be a major public health problem worldwide especially in low and middle-income countries. To assess the knowledge, attitude and practice among final year medical students of Karachi regarding management of Tuberculosis.

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

Results: Only 24.1% students were able to correctly identify that 2 samples are needed for confirmation of TB diagnosis, only 21.7% knew which medicines were used in category 2 continuation phase of treatment, only 41.4% knew the second line drugs of tuberculosis, and only 43.5% knew that peripheral neuritis is the side effect of isoniazid. Less than half stated correctly that optic neuropathy effect is caused by ethambutol while hepatotoxic effects are caused by INH (47.8% and 42.9% respectively). Less than half (49.1%) students said that if tuberculosis patient takes medicines regularly the symptoms will disappear while only 54.0% stated that a patient with latent tuberculosis should not be isolated.

Conclusion: Basic knowledge gaps regarding tuberculosis management have been highlighted in this study. This identification may help to develop tools to fill the gaps in the future with updated tuberculosis management included in the medical curriculum.

Key Words: Knowledge; Attitude; Tuberculosis; Medical Students; Chest X-Ray; Radiographic findings; Pleural effusion; Consolidation

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Introduction

Tuberculosis (TB) is one of the most common infectious diseases caused by mycobacterium tuberculosis and continues to be a major public health problem worldwide especially in low and middle-income countries.[1] Despite effective strategies that have been implemented by the World Health Organization (WHO) to prevent and control the disease, including the directly observed treatment short-course (DOTS) and stop TB strategies, its epidemic remains serious.[2,3] 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.[4] Globally, the best estimates are that 10 million people (range, 9.0–11.1 million) developed TB disease in 2017: 5.8 million men, 3.2

million women and 1.0 million children. There were cases in all countries and age groups, but overall 90% were adults (aged ≥15 years), 9% were people living with HIV (72% in Africa) and two thirds were in eight countries: India (27%), China (9%), Indonesia (8%), the Philippines (6%), Pakistan (5%), Nigeria (4%), Bangladesh (4%) and South Africa (3%).[4] These along with 22 other countries in WHO list of 30 high TB burden countries account for 87% of the world's cases.[4] The report also showed that Pakistan is ranked fifth amongst the countries designated to be highly burdened by TB and accounts for 61% of the TB burden in the World Health Organization (WHO) Eastern Mediterranean Region.[4]

With an aim to eliminate TB, National Tuberculosis Control Program (NTP) Pakistan endorsed the WHO initiated Directly Observed Treatment Short Course (DOTS) in 1995 and in 2001 declared TB a national emergency.[5] Annually an estimated 525,000 new TB cases have been identified in Pakistan every year 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 year.[4] A few territories in the North of Pakistan has a predominant figure of 554/100,000 cases annually.[6] In parts of the world such as Pakistan where the infection is prevalent, WHO prescribes that new-born children get an immunization called BCG (Bacille Calmette-Guérin). BCG is genuinely viable in shielding little kids from extreme TB complexities.[7] Individuals with latent TB may require only one sort of TB anti-microbial, though individuals with dynamic TB (especially MDR-TB) will frequently require a range of different medications. Antibiotic resistance is a growing problem in multiple drug-resistant tuberculosis (MDR-TB) infections. Anti- microbial is generally needed to be taken for a moderately long time. Globally, 3.5% of new TB cases and 18% of previously treated cases had MDR/RR-TB in 2017 according to the Global TB Report 2018.[4] It is estimated that Pakistan has the fourth highest prevalence of multidrug-resistant tuberculosis (MDR-TB) globally.[2]

Studies from different countries documented that one of the main factor related to health facility staff is delay in diagnostic of disease which is due to inadequate TB knowledge, inability to prescribe a smear test for suspected TB cases, inability to refer suspected TB cases to county TB dispensaries or designated hospitals for TB care and misdiagnosis.[8-10] In this context, TB knowledge among medical students is particularly important and undergraduate training regarding TB should be strengthened because students face significant exposures and consequently have the highest risk of infection or disease.[11] Furthermore, because medical students are potential future physicians and leaders, these students need to understand the epidemiology, determinants, screening and management of TB to promote effective prevention, early diagnosis, and successful treatment.[12]

The End TB Strategy milestones for 2020 and 2025 can only be achieved if TB diagnosis, treatment and prevention services are provided within the context of progress towards universal health coverage (UHC), and there is need to address the social and economic factors that drive TB epidemics. However, if there is lack of knowledge about TB and DOTS among medical students who are the budding doctors, this can have an impact on TB control causing these milestones not to be achieved. Several studies done in various countries have reported that TB knowledge of undergraduate medical students is insufficient.[13-15] 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.[16,17] Thus physicians of the future need to be aware of the epidemiology, determinants, screening, and management of re-emerging infections such as tuberculosis. Increased exposure and education in both academic and clinical settings is crucial if medical students especially are to become competent in this arena. In view of this prevailing situation a need was felt to assess whether final year medical students have adequate knowledge and a study was carried out with the objective of assessing the knowledge, attitude and practice among final year medical students of Karachi regarding management of Tuberculosis.

Methodology

A cross-sectional study was conducted in two medical colleges located in different districts of Karachi from January 2017 to June 2017. Cluster sampling was done for this study, with six clusters made according to the number of districts in Karachi. From these, two districts, i.e. Malir and Karachi South, were randomly selected for the study and from each of these districts one medical college was randomly selected, Baqai Medical College from Malir and Shaheed Mohtarma Benazir Bhutto Medical College from Karachi South were included. The inclusion criterion of the study was being a final year MBBS student of the college whereas refusal to give written informed consent was the exclusion criterion of the study. Taking the percentage frequency of the outcome variable to be 50%, with 95% confidence interval and 9% precision, the minimum required sample size was calculated to be 119 participants. Research instrument was a semi structured question-naire administered by the principal investigator to all

the participants. It consists of four sections; one for demographic questions, second for knowledge, third for attitude, and fourth for practice related questions regarding tuberculosis. Study variables included their knowledge, perception and practice of DOTs regimen including diagnosis and management and treatment of tuberculosis. The questionnaires had multiple choice questions with single correct responses. The subjects had a choice of not answering any question they did not know. Ethical approval to conduct the study was obtained from the departmental review committee while a written consent was obtained from each respondent. Data collected were analyzed using SPSS statistical package version 20 after data cleaning, and ensuring data validity through random checks. Frequency data were generated for the study.

Results

A total of 121 final year medical students were included in the study with a response rate of 100% but as some entries were missing the total data was analyzed with different counts for certain variables as

Table 1: Assessment of Tuberculosis related Knowledge

Variables	Count (%)
Tuberculosis is caused by: (n=121)	
Protozoa	1 (0.8)
Viral	1 (0.8)
Sporozoa	1 (0.8)
Bacterial	118 (97.5)
Which type of tuberculosis spreads due to animal?	**(n=113)**
Bovine TB	95 (84.1)
MDR TB	3 (2.7)
Miliary TB	10 (8.8)
Latent TB	5 (4.4)
Which type of tuberculosis cannot spread to others?	**(n=110)**
Bovine TB	11 (10.0)
MDR TB	9 (8.2)
Miliary TB	14 (12.7)
Latent TB	76 (69.1)
Tuberculosis is transmitted by:	**(n=121)**
Air born droplet	83 (65.6)
Droplet	10 (8.3)
Infected person to susceptible person	26 (21.5)
Infected animal (cattle)	2 (1.6)
Most effective method for diagnosis of tuberculosis is:	**(n=120)**
Tuberculin test	24 (20.0)
Chest x-ray	7 (5.8)
Sputum smear AFB	87 (72.5)
QFT-GIT	2 (1.7)
How many samples are required for confirmation of proper TB diagnosis?	**(n=116)**
1	19 (16.4)
2	28 (24.1)

3	66 (56.9)
4	3 (2.6)
As per EPI schedule BCG vaccine is given at:	**(n=119)**
At birth	109 (91.6)
After 2 week	3 (2.5)
After 4 week	3 (2.5)
After 6 week	4 (3.4)
PCR stands for: (n=119)	**(n=119)**
Premier chain reactio	2 (1.7)
Pre-test chain reaction	3 (2.5)
Principles of chain reaction	Nil
Polymerase chain reaction	114 (95.8)
Which test confirms DNA resistance to rifampicin?	**(n=113)**
Tuberculin test	8 (7.1)
GeneXpert	40 (35.4)
Sputum smear AFB	4 (3.5)
Nuclei acid amplification test (NAAT)	61 (54.0)
The duration of tuberculosis treatment is:	**(n=121)**
6 months	40 (33.1)
9 months	68 (56.2)
12 months	9 (7.4)
Other	4 (3.3)
Introduction of which drug minimized the treatment duration of tuberculosis?	**(n=113)**
Isoniazid	70 (61.9)
Pyrazinamide	6 (5.3)
Ethambutol	21 (18.6)
Rifampin	16 (14.2)
Which tuberculosis medicine is used as chemoprophylaxis?	**(n=114)**
Isoniazid	48 (42.1)
Pyrazinamide	18 (15.8)
Ethambutol	11 (9.6)
Rifampin	37 (32.5)
Ethambutol is replaced by:	**(n=118)**
Isoniazid	7 (5.9)
Pyrazinamide	81 (68.6)
Ethambutol	24 (20.3)
Rifampin	6 (5.1)

Which tuberculosis medicine is used in category 1 intensive phase (first 2 months)?	**(n=116)**
Rifampin, pyrazinamide	22 (19.0)
Isoniazid, kanamycin	11 (9.5)
Isoniazid, rifampin	77 (66.4)
Isoniazid, ethambutol	6 (5.2)
Which tuberculosis medicine is used in category 2 intensive phase (first 3 months)?	**(n=115)**
INH, EMB, PZA, Rifampin, Amikacin	17 (14.8)
INH, EMB, PZA, Rifampin, Kanamycin	9 (7.8)
INH, EMB, PZA, Rifampin, Streptomycin	75 (65.2)
INH, EMB, PZA, Rifampin, Capreomycin	14 (12.2)
Which tuberculosis medicine is used in category 2 continuation phase?	**(n=115)**
Rifampin, Pyrazinamide, Ethumutol	15 (13.0)
Isoniazid, Rifampicin, Ethumbutol	25 (21.7)
Isoniazid, Rifampin, Streptomycin	47 (40.9)
Isoniazid, Ethambutol. Amikacin	28 (24.3)
Names of first line drugs of tuberculosis:	**(n=115)**
INH, EMB, PZA, RIF, Cycloserine.	7 (6.1)
INH, EMB, PZA, RIF, Amikin	16 (13.9)
INH, EMB, PZA, RIF, Streptomycin	83 (72.2)
INH, EMB, PZA, RIF, Ethionamide	9 (7.8)
Names of Second line drugs of tuberculosis:	**(n=116)**
Ethionamide,- PAmino salicylic, Cycloserine, Fluroquinolones, Rifampin, amikacin	30 (25.9)
Ethionamide, P-Amino salicylic, Cycloserine, Fluroquinolones, Rifabutin, Isoniazid	21 (18.1)
Ethionamide, P-Amino salicylic, Cycloserine, Fluroquinolones, Rifabutin, Pyrazinamide	17 (14.7)
Ethionamide, P-Amino salicylic, Cycloserine, Fluroquinolones, Rifabutin, Amikacin	48 (41.4)
Peripheral neuritis is the side effect of:	**(n=115)**
Isoniazid	50 (43.5)
Pyrazinamide	34 (29.6)
Ethambutol	20 (17.4)
Rifampin	11 (9.6)
Ototoxic effects are caused by:	**(n=119)**
Isoniazid	13 (10.9)
Pyrazinamide	17 (14.3)
Pyrazinamide	17 (14.3)
Streptomycin	75 (63.0)
Rifampin	14 (11.8)

Optic neuropathy effects are caused by:	(n=113)
Isoniazid	33 (29.2)
Pyrazinamide	14 (12.4)
Ethambutol	54 (47.8)
Rifampin	16 (14.2)
Which tuberculosis medicine is used as chemoprophylaxis?	**(n=114)**
Isoniazid	48 (42.1)
Pyrazinamide	18 (15.8)
Ethambutol	11 (9.6)
Rifampin	37 (32.5)
Ethambutol is replaced by:	**(n=118)**
Isoniazid	7 (5.9)
Pyrazinamide	81 (68.6)
Ethambutol	24 (20.3)
Rifampin	6 (5.1)
Which tuberculosis medicine is used in category 1 intensive phase (first 2 months)?	**(n=116)**
Isoniazid, Rifampin, Amikacin, Pyrazinamide	6 (5.2)
Isoniazid, Kanamycin, Ethambutol, Pyrazinamide	8 (6.9)
Isoniazid, Rifampin, Ethambutol, Pyrazinamide	99 (85.3)
Isoniazid, Rifampin, Ethambutol, Capreomycin	3 (2.6)
Which tuberculosis medicine is used in category 1 continuation phase?	**(n=116)**
Rifampin, pyrazinamide	22 (19.0)
Isoniazid, kanamycin	11 (9.5)
Isoniazid, rifampin	77 (66.4)
Isoniazid, ethambutol	6 (5.2)
Which tuberculosis medicine is used in category 2 intensive phase (First 3 months)?	**(n=115)**
INH, EMB, PZA, Rifampin, Amikacin	17 (14.8)
INH, EMB, PZA, Rifampin, kanamycin	9 (7.8)
INH, EMB, PZA, Rifampin, streptomycin	75 (65.2)
INH, EMB, PZA, Rifampin, Capreomycin	14 (12.2)
Which tuberculosis medicine is used in category 2 continuation phase?	**(n=115)**
Rifampin, Pyrazinamide, Ethumutol	15 (13.0)
Isoniazid, Rifampicin, Ethumbutol	25 (21.7)
Isoniazid, Rifampin, Streptomycin	47 (40.9)
Isoniazid, Ethambutol. Amikacin	28 (24.3)
Names of first line drugs of tuberculosis:	**(n=115)**
INH, EMB, PZA, RIF, Cycloserine.	7 (6.1)
INH, EMB, PZA, RIF, Amikin	16 (13.9)
INH, EMB, PZA, RIF, Streptomycin	83 (72.2)
INH, EMB, PZA, RIF, Ethionamide	9 (7.8)

Names of Second line drugs of tuberculosis:	**(n=116)**
Ethionamide, P-Amino salicylic, Cycloserine, Fluroquinolones, Rifampin, Amikacin	30 (25.9)
Ethionamide, P-Amino salicylic, Cycloserine, Fluroquinolones, Rifabutin, Isoniazid	21 (18.1)
Ethionamide, P-Amino salicylic, Cycloserine, Fluroquinolones, Rifabutin, Pyrazinamide	17 (14.7)
Ethionamide, P-Amino salicylic, Cycloserine, Fluroquinolones, Rifabutin, Amikacin	48 (41.4)
Peripheral neuritis is the side effect of:	**(n=115)**
Isoniazid	50 (43.5)
Pyrazinamide	34 (29.6)
Ethambutol	20 (17.4)
Rifampin	11 (9.6)
Ototoxic effects are caused by:	**(n=119)**
Isoniazid	13 (10.9)
Pyrazinamide	17 (14.3)
Streptomycin	75 (63.0)
Rifampin	14 (11.8)
Optic neuropathy effects are caused by:	**(n=113)**
Isoniazid	33 (29.2)
Pyrazinamide	14 (12.4)
Ethambutol	54 (47.8)
Rifampin	12 (10.6)
Hepatotoxic effects are caused by:	**(n=112)**
Isoniazid	48 (42.9)
Pyrazinamide	13 (11.6)
Ethambutol	22 (19.6)
Rifampin	29 (25.9)
DOTS stands for:	**(n=118)**
Directly Ongoing Treatment short course	10 (8.5)
Directly Observed Trail short course	8 (6.8)
Directly Observed Treatment short course	71 (60.2)
Daily Observe Treatment short course	29 (24.6)
XDR-TB stands for:	**(n=113)**
Extensively drug-resistant TB	77 (68.1)
Excessive drug-resistant TB	16 (14.2)
Extensive drug response TB	14 (12.4)
Extra drug-revised in TB	6 (5.3)
MDR-TB stands for:	**(n=114)**
Multi-drug resistant TB	92 (80.7)
Massive drug-resistant TB	6 (5.3)

Multiple drug required in TB	10 (8.8)
Major drug-revised in TB	6 (5.3)
Can a pregnant woman take tuberculosis medicine?	**(n=114)**
Agree	59 (51.8)
Strongly agree	14 (12.3)
Disagree	36 (31.6)
Strongly disagree	5 (4.4)
Does HIV/AIDS make a person more vulnerable to tuberculosis?	**(n=115)**
Agree	40 (34.8)
Strongly agree	59 (51.3)
Disagree	9 (7.8)
Strongly disagree	7 (6.1)
Fever, night sweat, and weight loss are common sign and symptoms of tuberculosis:	**(n=116)**
Agree	37 (31.9)
Strongly agree	66 (56.9)
Disagree	9 (7.8)
Strongly disagree	4 (3.4)
Hearing loss is side effect of TB treatment:	**(n=116)**
Agree	77 (66.4)
Strongly agree	29 (25.0)
Disagree	7 (6.0)
Strongly disagree	3 (2.6)

shown in the result tables. Looking at the demographic profile of the study participants we see a predominance of females with 84 female medical students. Table 1 shows information regarding knowledge of TB with majority (97.5%) of the students correctly stating that TB is caused by bacteria and 84.1% knowing which type of TB spreads due to animal while 69.1% knew that Latent TB cannot spread to others. Also 65.8% of the students were aware that TB transmission is due to airborne droplet while 72.5%, knew the effective method for TB diagnosis is sputum smear AFB but only 24.1% students were able to correctly identify that 2 samples are needed for confirmation of TB diagnosis, instead more than half (56.9%) answered that 3 samples were required. Majority (91.1%) students correctly identified that BCG vaccine is given at birth as per EPI while 95.8% correctly identified that PCR stands for polymerase chain reaction. Nuclei acid amplification test (NAAT) was identified as DNA resistance test to

Table 2: Assessment of Tuberculosis related Attitude

Variable (n=113)	**Count (%)**
Do you think tuberculosis is curable?	
Agree	52 (46.0)
Strongly agree	50 (44.3)
Disagree	5 (4.4)
Strongly disagree	6 (5.3)
Do you think if a patient does not take regular anti tuberculosis medicines he can spread it to others?	

Agree	36 (31.9)
Strongly agree	64 (56.6)
Disagree	9 (8.0)
Strongly disagree	4 (3.5)
Do you think if a patient takes regular anti tuberculosis medicine then symptoms will disappear?	
Agree	56 (49.6)
Strongly agree	47 (41.6)
Disagree	6 (5.3)
Strongly disagree	4 (3.5)
Do you think Latent TB patient should be isolated?	
Agree	35 (31.0)
Strongly agree	17 (15.0)
Disagree	55 (48.7)
Strongly disagree	6 (5.3)
Do you think if a patient does not take proper anti TB medicine he/she can developed MDR-TB?	
Agree	49 (43.4)
Strongly agree	41 (36.3)
Disagree	9 (8.0)
Strongly disagree	4 (3.5)
Do you think if a patient takes regular anti tuberculosis medicine then symptoms will disappear?	
Agree	56 (49.6)
Strongly agree	47 (41.6)
Disagree	6 (5.3)
Strongly disagree	4 (3.5)
Do you think Latent TB patient should be isolated?	
Agree	35 (31.0)
Strongly agree	17 (15.0)
Disagree	55 (48.7)
Strongly disagree	6 (5.3)
Do you think if a patient does not take proper anti TB medicine he/she	
can developed MDR-TB?	
Agree	49 (43.4)
Strongly agree	41 (36.3)
Disagree	18 (15.9)
Strongly disagree	5 (4.4)

Do you think DOTS is effective treatment for tuberculosis?	
Agree	54 (47.8)
Strongly agree	48 (42.5)
Disagree	10 (8.8)
Strongly disagree	1 (0.9)
Do you think tuberculosis treatment should be under the supervision?	
Agree	44 (39.0)
Strongly agree	59 (52.2)
Disagree	6 (5.3)
Strongly disagree	4 (3.5)
Do you think hemoptysis occurs in Latent TB?	
Agree	38 (33.6)
Strongly agree	17 (15.0)
Disagree	53 (46.9)
Strongly disagree	5 (4.4)
Do you think x-ray chest is the first investigation of choice in tuberculosis?	
Agree	67 (59.3)
Strongly agree	22 (19.5)
Disagree	20 (17.7)
Strongly disagree	4 (3.5)
Do you think people hate a tuberculosis patient?	
Agree	57 (50.4)
Strongly agree	26 (23.0)
Disagree	21 (18.6)
Strongly disagree	9 (8.0)
Do you thing a family member can be DOTS provider?	
Agree	63 (55.7)
Strongly agree	35 (31.0)
Disagree	12 (10.6)
Strongly disagree	3 (2.7)
Do you thing nail clubbing occur in tuberculosis?	
Agree	42 (37.2)
Strongly agree	16 (14.1)
Disagree	46 (40.7)
Strongly disagree	9 (8.0)
Do you thing BCG vaccine be used as preventive measure for tuberculosis?	
Agree	48 (42.5)
Strongly agree	52 (46.0)
Disagree	8 (7.1)
Strongly disagree	5 (4.4)

rifampicin by 54% students but unfortunately over half (56.2%) of the students wrongly answered that the treatment duration of TB was 9 months. Only 14.2% students knew that time duration of TB treatment was minimized by Rifampin while 42.1% stated that INH was used as chemoprophylaxis and more than half (68.6%) knew that ethambutol was replaced by streptomycin as treatment. Most of the students were aware of the medications used in treatment with 85.3% students correctly identifying the medicine used in category 1 intensive phase, while 66.4% said that the medicine used in category 1 continuation phase is INH and RIF. Most (65.2%) of the students correctly stated the drugs used in category 2 intensive phase but only 21.7% knew which medicines were used in category 2 continuation phase. Regarding first line drugs of TB 72.2% students correctly stated what was used, while only 41.4% knew the second line drugs of TB. Only 43.5% students knew that Peripheral neuritis is the side effect of INH, while 63% reported that ototoxic effect is caused by Streptomycin. Less than half (47.8% and 42.9%) students correctly stated that Optic neuropathy effect is caused by ethambutol while hepatotoxic effects are caused by INH respectively. Around 60.2% students reported that DOTS stands for Directly Observed Treatment Short course while 68.1% identified that XDR-TB stands for extensively drug resistant TB and 80.7% knew that MDR-TB means Multi drug resistant TB. Combining strongly agree and agree responses we observe that overall 64% students were of the opinion that pregnant women should take TB medicine while 86% stated that HIV/AIDS makes a person more vulnerable to TB. Nearly 90% identified the common sign and symptoms of TB while 91.4% of the students identified hearing loss as a side effect of TB treatment.

Table 3: Assessment of Tuberculosis related Practice

Variables (n=109)	Count (%)
Do you wear N95 facemask when you attend a TB patient?	
Agree	32 (29.4)
Strongly agree	36 (33.0)
Disagree	36 (33.0)
Strongly disagree	5 (4.6)
Do you perform physical examination for the confirmation of tuberculosis?	
Agree	**56 (51.4)**
Strongly agree	13 (11.9)
Disagree	39 (35.8)
Strongly disagree	1 (0.9)
Do you perform clinical test for the diagnosis of TB?	
Agree	51 (46.8)
Strongly agree	49 (45.0)
Disagree	7 (6.4)
Strongly disagree	2 (1.8)
TB patient follow up weekly 1st two months?	
Agree	56 (51.4)
Strongly agree	44 (40.4)
Disagree	6 (5.5)
Strongly disagree	3 (2.7)
Do you counseling and health education about tuberculosis?	
Agree	39 (35.8)

Strongly agree	65 (59.7)
Disagree	2 (1.8)
Strongly disagree	3 (2.7)
Do you advise isolated TB patient from other peoples if active?	
Agree	49 (45.0)
Strongly agree	48 (44.0)
Disagree	7 (6.4)
Strongly disagree	5 (4.6)
Do you advise TB patient take your medicine at same time every day before the breakfast?	
Agree	58 (53.2)
Strongly agree	37 (34.0)
Disagree	8 (7.3)
Strongly disagree	6 (5.5)
Do advise TB patient after taking medicine brush teeth?	
Agree	45 (41.3)
Strongly agree	33 (30.3)
Disagree	25 (22.9)
Strongly disagree	6 (5.5)
Do you advise when you taking medicine marked calendar on the daily basis?	
Agree	62 (56.9)
Strongly agree	38 (34.9)
Disagree	7 (6.4)
Strongly disagree	2 (1.8)
Do you advise when you forget your pills informed to health care provider?	

Table 2 shows the attitude of the students towards TB management with 90.3% thinking TB is curable when combining strongly agree and agree responses while 56.6% strongly agreeing that if a patient does not take TB medicines regularly he can spread it to others. Overwhelming majority (91.2%) students said that if TB patient takes medicines regularly his symptoms will disappear while 54% do not agree that Latent TB should be isolated. Overall 79.7% students think about if a TB patient does not take medicine properly he will develop MDR-TB and over90% thinking that DOTS is effective treatment for TB with 91.2% students consenting to having TB treatment under supervision. Around half (51.3%) students were of the opinion that hemoptysis does not occurs in Latent TB while 78.8% think that X-ray chest is the first choice of investigation in TB. Nearly 73.4% students were of the opinion that people hate TB patients while 86.7% think that a family member can be a DOTS provider. Only half (51.3%) students identified nail clubbing as a sign of TB while an overwhelming 88.5% thought that BCG vaccine can be used as a preventive measure.

Table 3 identifies the practices which were followed by the medical students regarding TB management. It showed that overall 62.4% students wear N95 facemask when they attend a TB patient while 63.3% perform a physical examination of the patient for TB confirmation and 91.8% perform a clinical test for the diagnosis of TB. Over 91.8% students advise their TB patients to follow-up weekly for the first 2 months and 95.5% counsel them and give health education while 89% advise the TB patient to be isolated from other peoples if they are active. With regards to medication 87.2% students advice TB patient to take medicine at same time every day before breakfast and 71.6% ask patients to brush after taking medicine. Majority (91.8%) of students think that TB patients should use

a marked calendar on daily basis when taking medicines while 90.8% advise the patients to inform the health care provider if they forget their pills.

Discussion

This study reveals certain shortcomings in the knowledge of final year medical students regarding TB management. Majority of the students in this study knew that TB is caused by bacteria and that Bovine-TB is caused by an animal. Also two third students were aware that Latent-TB cannot spread to others in this study and 75% students identified that TB is caused by airborne droplet and droplet infection compared to 87% general practitioners and 96% medical interns in other studies done in Pakistan.6,18 According to this study majority (72.5%) of final year students identified sputum for AFB as the most effective method for diagnosis of tuberculosis which is higher than reported in other studies done in south western Nigeria (33.6%) and Lahore Pakistan (40% & 51%) and comparable to studies done on medical interns (65.9% and 71%) in India but less then seen in another Indian study done in medical undergraduates (92%).5, 15, 19-21 In this study only a quarter of students correctly identified the number of AFB samples required for confirmation just as per new guidelines of National Tuberculosis Control program Pakistan while another study done in Lahore reported a much higher number (40%).5, 22

Assessing the knowledge of vaccines and TB testing, more than 90% knew that BCG vaccine should be given at birth compared to only a quarter of students in a study done in china.17 Almost all students knew what PCR stood for and over half of the students identified the test for DNA resistance to rifampicin (NAAT) nuclei acid amplification. In this study over half of the final year students suggested 9 months for TB treatment which is not according to current guidelines and only a quarter knew the correct duration of TB treatment while in another study done in Nigeria only 6.7% knew correct duration of TB treatment.15

Regarding knowledge about TB medicines, the medicines used in category 1 were better known by final year students in this study (85.3%) compared to medical interns (56.5%) in another study.18 In continuation phase 66.4% medical students knew about recommended continuation two drug combinations compared to only half (52%) of the medical interns.18 More than half (65.2%) medical students knew the TB medicines used in category 2 intensive phase while only 40.9% knew the correct medicines used in category 2 continuation phase. 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 while 43.5% medical students knew Isoniazid may cause peripheral neuritis, 63% knew Streptomycin causes ototoxic effect and another 47.8% knew optic neuropathy is caused by Ethambutol but unfortunately only 11.6% knew Pyrazinamide causes Hepatotoxicity.

Only 60.2% of medical students in this study knew what DOTS stood for and this was much lower than reported in another study done in Lahore (84%) and 100% in a study done on medical interns in India.19, 23 What XDR-TB and MDR-TB stands for in this study was known by 68.1% and 80.7% of medical students compatable to 58.8% and 96.4% in interns seen in another study done in Maharashtra India while studies done in 2014-2015 in Pakistan reported 40% and 32% having knowledge of MDR-TB.20,23,24 Nearly 89% of the medical students in this study were able to identify the common sign and symptoms of TB compared to 97.6% final year students in in china and 92.2% medical interns in India.17,23

In this study 89.9% students were of the opinion that DOTS is effective treatment of TB compared to 92% medical interns and 72% final year students in another study.19 Over 91% medical students think TB treatment should be under supervision and over half think hemoptysis does not occur in Latent TB. Chest X-ray was the first choice of investigation in 78.2% of medical students while 72.9% students think people hate TB patients. Only 13.3% of students in this study think that family members cannot be DOTS provider which is lower to what was found in a study done in India.25

In this study regarding practice of TB management around 62.4% final year medical graduates use N95 mask when seeing a TB patient compared to only 17% in a study done in undergraduates in India.5 More than half students perform physical examination for the confirmation of TB while 91.8% perform clinical test for the diagnosis of TB and same number of students advise weekly follow-up to TB patient for first two months.

Conclusion

Tuberculosis is a highly prevalent disease all over the world and Pakistan stands fifth in this disease globally. Basic knowledge gaps regarding TB management have been highlighted in this study done among MBBS final year students (class of 2017) and this may help to develop tools to fill the gaps in the future with updated TB management included in the MBBS course curriculum.

Recommendation

Inadequate knowledge of the students (class of 2017) about TB management as highlighted in this study requires amendments in MBBS course, increase in updated information about NTP in the MBBS curriculum for the students, need to arrange CME continuous medical education for the students and arrange seminars as well as motivate to initiative NTP national tuberculosis programs. Also increased awareness about TB management to the future physicians and gate keepers is needed to identify right diagnosis at right time with right medication.

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