

Awareness among First Year Medical Students in Telangana State about Tuberculosis and Government Services Offered to Tuberculosis Patients: A Cross Sectional Study

Kishore Yadav Jothula¹, Sreeharshika D², Srikanth JV³

¹Department of Community and Family Medicine, All India Institute of Medical Sciences, Bibinagar, Telangana, India

²Department of Forensic Medicine, ESIC Medical College, Hyderabad, Telangana, India

³Primary Health Centre, Chowdepally, Chittor District, Andhra Pradesh, India

Corresponding Author: Sreeharshika D

ABSTRACT

Background: Tuberculosis still remains as major cause of mortality and morbidity in India. Much importance must be given in sensitisation of community about tuberculosis and the services offered in order to curb the disease. With this background, this study was undertaken to assess the awareness among first year medical students about Tuberculosis and government services offered to tuberculosis patients

Methods: Institutional based cross sectional study with sample size of 165 first year medical students who volunteered for the study.

Results: Among the participants 43% knew TB is one of the top 10 global causes of death, 78.8% knew bacteria causes TB, 95.75% knew mode of transmission is by cough droplets and 91.5% opted lung as primarily affected organ in TB. Only 67.9% knew TB as curable disease and 4.8% knew about vaccine. Majority (83.3%) identified cough more than 2 weeks as important presumptive TB symptom. Only 33.9% knew about free diagnostic services, 18.2% about free drugs supply in government setup, 58.8% seen advertisement on TB.

Conclusion: This study found that majority participants were aware about causative organism and symptoms of TB but doesn't have clue regarding government services and IEC activities related to TB.

Key words: Bacteria, Government, IEC, Transmission, Tuberculosis, Vaccine

INTRODUCTION

Tuberculosis (TB) is an ancient global public health problem and it still remains as major cause of mortality and morbidity in India.¹As per Global TB report 2019 the estimated incidence of TB in India was approximately 27 lakhs accounting for about a quarter of the world's TB cases.² The mortality rate in India for the year 2017, excluding cases having both TB and HIV was 31/deaths per 1lakh population.¹ In addition to the existing burden of TB, the pandemic of HIV has further aggravated the incidence of TB and WHO estimated that 5% of TB patients are also co-infected with HIV.³In India, High quality diagnostic and treatment services are provided to the people through Revised National Tuberculosis Control Programme(RNTCP) programme which was recently renamed as National Tuberculosis Elimination Programme (NTEP).

India has taken ambitious step of eliminating TB by 2025 and National strategic plan (NSP 2017-25) was prepared with the vision of TB-Free India with zero deaths, disease and poverty due to TB. Advocacy Communication & Social Mobilization (ACSM) is an important component proposed by NSP with the objective of addressing the issues like lack

of knowledge and information about TB in the community.⁴

Most of the people are visiting private hospitals and spending lot of money for TB treatment. In a study conducted in Puducherry, it was observed that 32.4% of households experienced catastrophic costs due to TB care, significantly higher in patients with TB care.⁵ These findings reflects the need to generate awareness in community regarding free services provided in government setup and to motivate people to utilise those services, Information Education and Communication (IEC) activities were carried out in the form of advertisements, hoardings related to TB through various channels of communication.

With this background, the current study was undertaken to assess the reach of the advertisements and hoardings related to TB in the community by enquiring newly joined medical students about various aspects of tuberculosis. This particular group was selected based on assumptions that they are active in social media, and more likely to pay attention towards hoardings or advertisements related to diseases and they belongs to different parts of state and country. 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 and thus the opportunity was taken to introduce TB to the young budding doctors. The current study was carried out with the objectives of assessing the awareness among first year medical students about tuberculosis, government services offered to tuberculosis patients and IEC activities related to TB.

METHODS

Study Design: Institutional based Cross Sectional Study.

Study Period: This study was carried out for 1month from September 1st 2018 to September 30th 2018

Study subjects: First year medical students

Study Setting: Rural medical college located in Nalgonda district in Telangana state.

Sample size: Out of 200 first year students, 30 had participated in the pilot study and 5 students were absent on the day of data collection. Hence a total of 165 first year students were included after taking consent, hence sample size was 165.

Sampling Method: Census method where all the willing students were included in the study

Study Tool: A semi-structured questionnaire was prepared and suitable modifications were made after administering in a pilot study. The questionnaire consists of questions related to demographic information, knowledge about TB and various services offered by government and IEC related questions.

Method of Data Collection: Interview method after explaining them the importance of study and obtaining consent. Confidentiality was ensured.

Analysis: Data was entered in Microsoft excel and analysis was done using SPSS statistical package version 23. Data was presented in percentages.

RESULTS

Most of the participants were female participants (61.2%) and city residents (46.7%). The mean age of the study participants was 17.95 ± 0.74 years. (Table:1) 43% subjects knew TB is one of the top 10 global causes of death and only 3% knew India is the highest TB burden country in terms of new cases that occur every year. Majority (78.8%) of the students was aware of causative organism but most of the students doesn't have knowledge about risk factors. (Table:2)

Most (95.75%) of the subjects were aware of droplet mode of transmission but 37.57% opted sexual route as mode of transmission. (Table:3) 91.5% of the participants knew that TB primarily affects lungs and most of the participants were aware of fact that TB is curable and

preventable. Only 10.81% of the subjects could name BCG vaccine. (Table:4)

Most (83.03%) of the participants identified cough more than 2 weeks as symptom of presumptive TB case followed by blood in sputum (52.72%). (Table:5)

Table.1 Sex & place distribution of study subjects (n=165)

Sex	Frequency	Percentage (%)
Male	64	38.8
Female	101	61.2
Residence	Frequency	Percentage (%)
Village	24	14.5
Town	64	38.8
City	77	46.7

Table:2 Awareness about Epidemiology of Tuberculosis (n=165)

s.no	Question	No. of students answered correctly (%)
1	TB is one of the top 10 global causes of death (T/F)*	71 (43%)
2	India is the highest TB burden country in terms of new cases that occur every year (T/F)	5 (3%)
3	TB is one of the leading causes of infertility in India (T/F)	14 (8.5%)
4	TB is one of the earliest opportunistic disease to develop in HIV patients	73 (44.2%)
5	What is the causative organism of TB? (Bacteria/virus/helminths/evil eye/ Don't know)	130 (78.8%)
6	TB affects all ages (T/F)	121 (73.3%)
7	TB is more prevalent in children than adults (T/F)	71 (43%)
8	TB is a hereditary disease (T/F)	115 (69.7%)
9	Malnutrition predispose to TB	38 (23%)
10	Diabetes increase the risk to develop TB disease	27 (16.4%)
11	Smoking can increase the risk of developing TB (T/F)	83 (50.3)

*T-True; F-False

Table:3 Awareness about mode of transmission (n=165)

s.no	Mode of transmission	Frequency (%)*
1	Cough droplets	158 (95.75)
2	Dishes and other articles used by patient	106 (64.24)
3	Sexual route	62 (37.57)
4	Dont know	1 (0.60)

* Total more than 100% due to multiple responses

Table:4 Awareness about clinical and preventive aspects of Tuberculosis (n=165)

s.no	Question	No. of students answered correctly (%)
1	TB can affect any organ in the body (T/F)	50 (30.3)
2	TB primarily affects which organ (lungs)	151 (91.5)
3	Specimen used to diagnose TB (sputum/blood/feces/urine)	101 (61.21)
4	Is TB curable? (Yes/No/Dont know)	112 (67.9)
5	Duration of treatment (6-12 months) (n=112)	36 (32.14)
6	Is TB preventable? (Yes/No/Dont know)	136 (82.4%)
7	Is there any vaccine related to TB	74 (44.8%)
8	Name the vaccine (n=74)	8 (10.81)

Table:5 Awareness about symptoms of presumptive TB case (n=165)

s.no	Symptoms	Frequency (%)*
1	Cough more than 2 weeks	137 (83.03)
2	Fever more than 2 weeks	38 (23.03)
3	Significant weight loss	64 (38.78)
4	Blood in sputum	87 (52.72)
5	Any abnormality in chest X-ray	57 (34.54)
6	Don't know	10 (6.06)

* Total more than 100% due to multiple responses

Table:6 Awareness about Government services provided to TB patients and IEC activities (n=165)

s.no	Government services related Question	No. of students answered correctly (%)
1	Amount charged for TB diagnostic services in government hospitals	56 (33.9%)
2	Amount charged for TB drugs in government hospitals	30 (18.2%)
s.no	IEC related Question (Students response)	Frequency (%)
1	Have you heard/seen DOTS programme related to TB (Yes)	26 (15.8%)
2	Have you seen any hoardings/advertisements related to TB (Yes)	97 (58.8%)
3	Have u read the message (n=97) (Yes)	54 (55.67)
4	What is the message (n=54) (Screen for TB if cough persist more than 2 weeks)	16 (29.62)
5	Identify the logo of TB control programme (correctly identified)	27 (16.4%)

Only 33.9% subjects were aware of free diagnostic services and only 18.2% subjects were aware of free treatment services offered in government hospitals. Only 15.8% of the participants have heard of DOTS programme. 58.8% subjects have seen hoardings or advertisements related to TB but only 55.67% of them have read the message. (Table:6)

Most common source of information about TB was found to be Television (63.03%) followed by internet (50.3%) (Table:7)

Table:7 Source of information about TB (n=165)*

Source	Frequency (%)
Television	104 (63.03)
Radio	32 (19.39)
Newspaper	62 (37.57)
Internet	83 (50.3)
Academic books	65 (39.39)
Magazines	29 (17.57)
Friends	39 (23.63)
Teachers	72 (43.63)
House hold members	26 (15.75)
Relatives	25 (15.15)
Hoardings	44 (26.66)

* Total more than 100% due to multiple responses

DISCUSSION

Awareness about Epidemiology of Tuberculosis:

The current study found that most of the students were not aware of severity of TB and its impact on the community which was revealed from the observation that only 43% subjects knew TB is one of the top 10 global causes of death. The present study also found that only 3% knew India is the highest TB burden country in terms of new cases that occur every year which was very shocking. However, due to inclusion of TB in curriculum, different results were observed among final phase medical undergraduates which was evident from the study done by Raghavendra L et al., in Karnataka where 92.7% of the intern doctors knew that India is highest TB burden country and in another study done on final year medical students in China by Ou Y et al., it was found that 64.9% participants knew that TB prevalence is high in India.^{3,6} As expected, only 8.5% participants knew that TB is one of the leading causes of infertility in India.

However, 44.2% of the subjects knew that TB is one of the earliest opportunistic disease to develop in HIV patients in the current study and in another study conducted by Hashemi SHAB et al., in Iran, 67.9% of the secondary school students thought that HIV infected patients are susceptible to infection with tuberculosis.⁷

When asked about causative organism, majority (78.8%) of the participants in the current study answered bacteria which is similar to the findings of Sah BK et al., study where 84% of secondary school students knew causative organism of the tuberculosis.⁸ In another study conducted by Shedole DT et al., it was observed that 72.8% of rural students knew that TB is caused by bacteria whereas only 60% of urban students were aware about this.⁹ Nagasrilatha B et al., study among 1st clinical medical students found that 99.3% of the students knew Mycobacterium tuberculosis as the causative agent for tuberculosis and shocking findings were observed in Behnaz F et al., study which was done in Iran among final year medical students where only 92.9% knew about etiology of Tuberculosis.^{10,11} Contrasting findings were observed in Khalid FA et al., study conducted in Sudan, where only 27.1% university students knew bacteria is the causative agent of TB and surprisingly only 35.2% of pulmonary TB patients knew about causative agent as revealed by the study carried out by Konda SG et al., in Navi Mumbai.^{12,13}

The current study found that 73.3% of the participants were aware of TB affecting all age groups, which is similar to the findings of Shedole DT et al., study in which 85% of urban students and 76.1% of rural students answered that TB can affect anyone.⁹ It was observed that 69.7% subjects answered TB is not a hereditary disease which is similar to the findings of Sah BK et al., study and Grle SP et al., study.^{8,14} Regarding the risk factors of TB, only 23% identified malnutrition, 16.4% knew diabetes and 50.4% answered smoking increases the risk of developing TB

in the current study. The study conducted by Grle SP et al., among student population in Zagreb found that 65.6% and 64.33% of the subjects identified smoking and diabetes as risk factors respectively and in the study done in Nepal among secondary school students by Sah BK et al., all the participants answered smoking as a risk factor.^{14,8}

Awareness about mode of transmission:

In the present study, though majority (95.75%) of the subjects identified droplet as main mode of transmission for TB, 64.24% participants also opted dishes and other articles used by patient and surprisingly 37.57% opted sexual route as mode of transmission. Similar results were identified in the study done on third year medical graduates in Chennai by Revathi R et al., where 98% students answered correctly about route of transmission and in another studies conducted on final year medical students by Laurenti P et al., in Rome, Ou Y et al., in China, it was 98.9% and 89.7% respectively.^{15,16,6} Only 66% of the first clinical year medical students answered correctly about TB mode of transmission in Nagasrilatha B et al., study and it is only 57.04% in Jabri AA et al., study conducted among medical professionals in Omen.^{10,17} The study conducted by Easwaran M et al., on rural population of Tamil nadu showed that only 26.1% subjects knew about most common mode of transmission.¹⁸ Shoking results were observed in the study conducted by Honarvar B et al., on final year medical students in Iran, which stated that only 26.7% of subjects answered correctly about TB mode of transmission.¹⁹

Awareness about clinical and preventive aspects of Tuberculosis:

Current study showed that most (91.5%) of the participants opted lungs as primarily affected organ in TB and only 30.3% subjects knew that TB can affect any organ in the body. Otovwe A et al., study found that 56% of residents of Bambuka community were unaware of fact that TB affecting any part of the body.²⁰ Majority

(78%) of secondary school students knew that TB doesn't only affect lungs as revealed by Sah BK et al., study.⁸ In the present study, 61.21% study subjects rightly opted sputum as specimen used to diagnose TB where as in the study conducted by Abdurehiman T et al., on interns and post graduates in Tamilnadu, it was observed that more than 90% were aware of TB confirmatory test and in another study done by Behnaz F et al., 81.7% of final year medical students accepted that the most important and accessible method for detecting TB is sputum smear acid fast staining.^{21,11} Easwaran M et al., study showed that only 18.3% rural population in Tamil Nadu knew about sputum smear as diagnostic test for TB and surprisingly Olakunle OS et al., study observed that only 36.25% of final year medical students in Nigeria opted sputum exam as diagnostic test for TB.^{18,22} In another study conducted in Karnataka by Shedole DT et al., found that 49.4% of urban PU college students and 34.4% rural PU college students were aware of TB diagnosis by sputum smear.⁹

Majority (67.9%) of the participants in the current study knew that TB is curable which is similar to the findings of Khan MN et al., study done in Pakistan, where 67.3% of the participants answered TB as a curable disease.²³ Most of the participants in Behnaz F et al., study (97.2%) conducted among final year medical students in Iran and in Zhao Y et al., study (82.6%) conducted among first year medical students in China knew about TB as a curable disease.^{11,24} In a study done on non medical students in Sudan by Khalid FA et al., only 14.7% subjects knew that TB is curable.¹² Konda SG et al., study on pulmonary TB patients found that 83.6% of the subjects were aware of TB as curable disease.¹³ Regarding treatment duration, though it is beyond the scope of newly entered medical graduates, still 32.14% of the participants from the current study were aware of duration of TB treatment which is similar to the findings of Zhao Y et al., study where 26.2% of the first year students were aware of treatment

duration.²⁴ In a study conducted by Abdurehiman T et al., in Tamilnadu, only 32.4% interns and 39.6% post graduates answered correctly about duration of TB treatment.²¹

In the present study it was observed that majority (82.4%) of the participants identified TB as a preventable disease and in another community based study conducted in Riyadh city by Huwaymil MSB et al., only 43.9% of participants knew TB as preventable disease.²⁵ Majority (74.5%) of the pulmonary TB patients identified TB as a preventable disease in Konda SG et al., study.¹³ Current study revealed poor knowledge related to BCG vaccine among the study participants. Only 44.8% of the current study participants knew about availability of vaccine related to TB and only 10.81% of the subjects could name the vaccine related to TB. Montagna MT et al., observed that 73.4% of medical students in Italy knew about BCG vaccine where as only 28.6% of the first year clinical medicine students knew about BCG vaccine as per Nagasrilatha B et al., study.^{26,10} Majority (90.6%) of the final year medical students were aware of BCG vaccine as observed by Ou Y et al., study conducted in China and Sah BK et al., study on secondary school students in Nepal found that most (92%) of the subjects were aware of vaccine related to TB.^{6,8}

Awareness about symptoms of presumptive TB case:

When enquired about symptoms of presumptive TB case in the present study, most (83.03%) of the participants answered cough more than 2 weeks followed by blood in sputum (52.72%), significant weight loss (38.68%) and any abnormality in chest X-ray (34.54%). Only 23.03% subjects identified fever more than 2 weeks as presumptive TB symptom. Chennaveerappa PK et al., study in Karnataka found that 85.1% of medical students identified cough as most common symptom of TB, which is similar to the findings of Revathi et al., study in which 80% of third year medical students identified most common symptoms

of TB.^{27,15} 46.9% of secondary school students identified hemoptysis as symptom of TB in Hashemi SHAB et al., study conducted in Iran.⁷ Konda SG et al., study on pulmonary TB patients found low level of awareness about symptoms as indicated by the findings that 48.4% participants were aware that persistence cough is a TB symptom and other symptoms mentioned were coughing blood (24.8%), fatigue (23.1%), chest pain (12.3%), breathlessness (11.4%), and fever (5.7%).¹³

Awareness about Government services provided to TB patients and IEC activities:

Poor knowledge among current study participants regarding free diagnostic and treatment services offered to TB patients by Government hospitals was evident from the findings that only 33.9% subjects were aware of free diagnostic services and only 18.2% subjects knew about availability of TB drugs for free of cost in Government setup. Similar results were observed in Zhao Y et al., study where only 39.5% first year medical graduates knew about free treatment policy.²⁴ Shedole DT et al., study in Karnataka found that 51.1% of urban and 40.6% of rural PU students knew about free diagnostic and treatment services for TB patients.⁹

The current study also highlights the poor reach of IEC activities related to TB which was reflected by the findings that only 15.8% subjects heard about DOTS and 58.8% of the participants have seen hoarding or advertisement related to TB. Out of the total participants who had seen advertisement or hoarding, only 55.67% have read the message and out of them only 29.62% could recollect the message. It was also observed that only 16.4% correctly identified RNTCP logo. More than 90% of interns and PGs correctly mentioned the DOTS expansion in Abdurehiman T et al., study and in Revathi R et al., study 85% of third year medical graduates have knowledge on DOTS because of inclusion of TB in curriculum.^{21,15} Zhao Y et al., observed that only 10.8% of first year

medical graduated have heard of DOTS which is similar to the findings of current study.²⁴

Source of information about TB:

Most common source of information in the current study was found to be Television (63.03%) followed by Internet (50.3%) and Teachers (43.63%). Other studies done by Hashemi SHAB et al., on secondary school students and Srivastava DK et al., on Government and private practitioners found that television was the most common source of information.^{7,28} Abdurehiman T et al., study and Khan MN et al., study on medicos found internet as main source of information.^{21,23} Health workers were the main source of information in the study done by Konda SG et al., study on pulmonary TB patients.¹³ Mass media and teachers was the main source of information for non medical students as per the findings of Sah BK et al., study and Shedole DT et al., study.^{8,9}

CONCLUSION

Tuberculosis is one of the leading causes of morbidity and mortality in our country and it is time to act and the responsibility lies upon each and every one of the citizens to curb TB. The current study found that majority participants were aware about causative organism and symptoms of TB but doesn't have clue regarding government services and IEC activities related to TB though Government is spending huge amount of money. It is the need of the hour to bring awareness in the community about high quality diagnostic services and treatment which is provided for free of cost by government through RNTCP programme. There is a need to sensitise the community through intense IEC activities to utilise government services and also encourage private practitioners to involve in RNTCP programme in order to end TB by 2025 in India.

ACKNOWLEDGEMENTS

The authors were grateful to all the students who had participated in the study.

Declarations

Funding: No Funding Sources

Conflict of interest: None Declared

Ethical approval: The study was approved by the Institutional Ethical Committee

REFERENCES

1. Park K. Park's textbook of Preventive and Social Medicine. 25th ed. Jabalpur: M/S Banarsidas Bhanot Publishers;2019.p.188-90
2. WHO. Global Tuberculosis Report 2019: Country profiles for 30 high TB burden countries. France: WHO; 2019.p204 Available from: who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf (Accessed on: 15th January 2020)
3. Raghavendra L, Babu SP, Shivakumar KM. Assessment of knowledge of intern doctors of a medical college hospital in Karnataka on revised national TB control programme. *Int J Adv Med* 2017;4:1123-7
4. Central Tuberculosis Division, Government of India. Thematic areas: National strategic plan 2017-2025 for TB elimination in India. Available at: tbcindia.gov.in/WriteReadData/National%20Strategic%20Plan%202017-25.pdf (Accessed on: 15th January 2020)
5. Thirunavukkarasu Prasanna, Kathiresan Jeyashree, PalanivelChinnakali, Yogesh Bahurupi, Kavita Vasudevan, Mrinalini Das (2018) catastrophic costs of tuberculosis care: a mixed methods study from Puducherry, India, *Global Health Action*, 11:1
6. Ou Y, Luo Z, MouJ , Ming H, Wang X, Yan S, et al. Knowledge and determinants regarding tuberculosis among medical students in Hunan, China: a cross-sectional study. *BMC Public Health* 2018;18:730
7. Bani Hashemi SH, Khorgoei T, Mahboobi HR, Shahrzad ME, Amirzadeh Shams Sh, Mandegari Z, Yazdanparast M, Masqati M. Knowledge and attitudes towards tuberculosis among secondary school students in rural areas in Hormozgan, Southern Iran. *Int Elec J Med* 2011;1(1):11-6

8. Sah BK, Sah JP, Shah SK, et al. Knowledge on tuberculosis among students of higher secondary school, lalitpur, Nepal. *MOJ Public Health*. 2016;4(5):133–141.
9. Shedole DT, Devalgi SB, Vidya GS, Mendagudli RR, Kumar VB. A comparative study on awareness about tuberculosis among urban and rural P.U college students of Davangeretaluk, Karnataka, India. *Int J Community Med Public Health* 2015;2:552-7.
10. Nagasrilatha B, Sasidhar M, Bharathi M, Sasikala A, S. Bai SK. A study on impact of curriculum on knowledge of tuberculosis among medical students. *Journal of Education Technology in Health Sciences* 2016;3(3):91-94.
11. Behnaz F, Mohammadzade G, Mousavi-e-roknabadi RS, Mohammadzadeh M. Assessment of knowledge, attitudes and practices regarding tuberculosis among final year students in Yazd, Central Iran. *J Epidemiol Glob Health* 2014;4:81-85
12. Khalid FA, Mohammed AA. Knowledge and awareness of Tuberculosis among Students of University of Kassala, Sudan. *Sudan JMS* 2013;8(1):5-8
13. Konda SG, Melo CA, Giri PA. Knowledge, attitude and practices regarding tuberculosis among new pulmonary tuberculosis patients in a new urban township in India. *Int J Med Sci Public Health* 2016;5:563-569.
14. Grle SP, Plavec D, Brcina N, Borcic T. Differences in the knowledge about tuberculosis among general urban population and student population in Zagreb. *Medicina fluminensis* 2014;50(1): 98-105.
15. Revathi R, Dharanisri R. Knowledge about tuberculosis among undergraduate medical students in a private college in Chennai. *Int J Community Med Public Health* 2018; 5:644-6.
16. Laurenti P, Federico B, Raponi M, Furia G, Ricciardi W, Damiani G. *Med Sci Monit* 2013;19:865-874
17. Al-Jabri AA, Dorvlo ASS, Al-Rahbi S, Al-Abri J, Al-Adawi S. Knowledge of tuberculosis among medical professionals and university students in Oman. *East.Mediterr.Health J*. 2006;12(5):509-521
18. Easwaran M, Ramachandran D, Ramasamy R, George N, Mathew M, Bazroy J, et al. Knowledge, attitude, and practice regarding tuberculosis among rural population in Tamil Nadu. *Int J Med Sci Public Health* 2015;4:1681-1684.
19. Honarvar B, Shaygani F, Amini M, Shirdel F, Kiani F, Kazemi M, et al. Trend Analysis of Knowledge and Practice of National Tuberculosis Guidelines Among Medical Students: ATwo-Year Interventional Study in Shiraz, Iran. *Shiraz E-Med J*. 2018; 19(3):1-7
20. Agofure O, Okandeji-Barry ORA, Musa E and Odjimogho S. Knowledge of the Prevention and Management of Tuberculosis among Residents of Bambuka Community Karim Lamido Local Government Area of Taraba State. *SM J Public Health Epidemiol*. 2018; 4(1): 1048.
21. Abdurehiman T, Ramachandran K, Prasath RA, Srinivasan R. To assess the awareness and knowledge of pulmonary tuberculosis and RNTCP guidelines among interns and postgraduates at a tertiary care hospital in south India. *Paripex Indian J. Res*. 2018; 7(1):80-82.
22. Olakunle OS, Oladimeji O, Olalekan AW, Olugbenga-Bello A, Akinleye C, OluwatoyinOA. Knowledge of tuberculosis management using directly observed treatment short course therapy among final year medical students in South Western Nigeria. *Pan Afr Med J*. 2014;18:32.
23. Khan MN, Khan N, Anwer G, Akbar A (2017) Knowledge, Practice & Awareness of Tuberculosis Disease among Medical & Non-medical Students. *J BioequivAvailab* 9: 561- 564
24. Zhao Y, Ehiri J, Li D, et al. A survey of TB knowledge among medical students in Southwest China: is the information reaching the target?. *BMJ Open* 2013; 3:e003454.
25. Huwaymil MSB, Alkhalifah MA, Alsaqabi MAAOA, Alhabshan RF, Alzaid AN. Assessment of Knowledge, Attitudes and Practices Regarding Pulmonary Tuberculosis among Community in Riyadh City, 2017. *The Egyptian Journal of Hospital Medicine* 2017;69(5):2417-2420.
26. Montagna et al.: Knowledge about tuberculosis among undergraduate health care students in 15 Italian universities: a cross-sectional study. *BMC Public Health* 2014;14:970
27. Chennaveerappa P. K, Rajashekar H. K, Jayashree Nagaral, Halesha B. R, Raghavendra Prasad K. U, Vinaykumar M.

V, Nareshkumar M. N. "A Study on Awareness of Tuberculosis and RNTCP among Undergraduate Medical students and Interns". *Journal of Evolution of Medical and Dental Sciences* 2014; Vol. 3, Issue 29, July 21; Page: 8115-8121.

28. Srivastava DK, Mishra A, Mishra S, Chouksey M, Jain P, Gour N, et al. A comparative assessment of KAP regarding tuberculosis and RNTCP among Government and Private practitioners in

district Gwalior, India: An operational research. *Indian J Tuberc* 2011;58:168-177

How to cite this article: Jothula KY, Sreeharshika D, Srikanth JV. Awareness among first year medical students in Telangana state about tuberculosis and government services offered to tuberculosis patients: a cross sectional study. *International Journal of Research and Review*. 2020; 7(7): 170-178.
