



**ORIGINAL RESEARCH PAPER**

**Pulmonary Medicine**

**TO ASSESS THE AWARENESS AND KNOWLEDGE OF PULMONARY TUBERCULOSIS AND RNTCP GUIDELINES AMONG INTERNS AND POSTGRADUATES AT A TERTIARY CARE HOSPITAL IN SOUTH INDIA.**

**KEY WORDS:** Pulmonary tuberculosis, RNTCP, Interns, Postgraduates.

<b>Abdurehiman T.</b>	Postgraduate student, 2nd year, Department of Respiratory Medicine, Meenakshi Medical College Hospital & Research Institute, Kanchipuram, Tamil Nadu.
<b>Krishnappriya Ramachandran*</b>	Associate Professor, Department of Respiratory Medicine, Meenakshi Medical College Hospital & Research Institute, Kanchipuram, Tamil Nadu. *Corresponding Author
<b>Arun Prasath R</b>	Postgraduate student, Final year, Department of Respiratory Medicine, Meenakshi Medical College Hospital & Research Institute, Kanchipuram, Tamil Nadu.
<b>Srinivasan R</b>	Professor & Head Of Department. Dept of Respiratory Medicine, Meenakshi Medical College Hospital, and Research Institute,

<b>ABSTRACT</b>	<b>Introduction:</b> Tuberculosis is one of the most infectious diseases and leading causes of death in the World. India is considered as one of the countries with highest TB burden in the world. In most of the teaching institutions in India, interns and postgraduates treat a large number of patients with tuberculosis.
	<b>Aims and objective:</b> This study was aimed to assess the awareness and knowledge of pulmonary tuberculosis (PTB) and RNTCP guidelines amongst interns and Postgraduates in our institution.
	<b>Materials and methods:</b> A structured questionnaire was administered among 90 doctors (37 newly admitted interns and 53 postgraduates).
	<b>Results:</b> The results were compared between interns and postgraduates and-analyzed using Pearson Chi-Square test. Significant differences in knowledge were found among interns and postgraduates.
	<b>Conclusion:</b> Enhancement of knowledge on tuberculosis and RNTCP guidelines amongst interns and postgraduates should be given special emphasis during their training.

**INTRODUCTION:**

Tuberculosis(TB) remains a major public health menace internationally, leading to 10 million new cases and 1.3 million deaths worldwide in 2016<sup>1</sup>.India is considered as one of the countries with highest tuberculosis burden in the world<sup>2</sup> with an estimated incidence of 2.2 million cases and 2,20,000 deaths in the year 2015 as per WHO Global TB report<sup>3</sup>. As per WHO 2016 fact sheet report on tuberculosis, 7 countries account for 64% of the total TB burden, with India leading the count<sup>4</sup>.

The diagnosis and treatment protocols of tuberculosis have undergone many modifications, since the National Tuberculosis Control Programme (NTCP) was reviewed in India in 1992 and Revised National Tuberculosis Control Programme (RNTCP) was launched in March 1997<sup>5</sup>.

As Tuberculosis is a major burden on the society, each member of the healthcare system plays an important role in preventing and treating this infection. Therefore, knowledge about diagnosis and treatment amongst interns and postgraduates needs to be assessed and updated, as they are the first contact physicians for most of these patients.

**AIMS AND OBJECTIVE:**

The aim of the study was to assess the awareness and knowledge of pulmonary tuberculosis (PTB) amongst newly admitted interns and postgraduates by administering a series of questions related to tuberculosis.

The study also aimed to compare the results between interns and postgraduates.

**METHODOLOGY:**

This cross-sectional study was conducted amongst 90 participants including 37 Interns and 53 postgraduate students (Pgs), in Meenakshi Medical College Hospital and Research Institute, Kanchipuram in the month of June 2017.

The questionnaire was based on the assessment of knowledge on the definition, symptoms, investigations and treatment of tuberculosis including current guidelines and recent changes in RNTCP 2016. The questionnaire included 20 questions - 12 were

multiple choice type and 8 were open-ended. The answers to the multiple choice type questions and 7 open-ended questions were marked either as correct or an incorrect. Participants were classified into 4 categories (not answered-Poor, 1 to 2 symptoms answered-fair, 3 to 4 answered-good and all 5 answered-excellent) for the open-ended question related to symptoms based on the answers given by them.

The questionnaires were distributed to all participants and were allotted 20 minutes to answer the questions under strict supervision. The questionnaires were evaluated by a senior pulmonologist. Informed consent was taken from all the participants and approval was obtained from ethical committee.

The participants were divided into 2 groups, first group consisting of interns and second group consisting of postgraduates for comparison of the results.

**STATISTICAL ANALYSIS:**

The data collected was entered into Microsoft Excel and was analyzed by SPSS Version 21(IBM). Pearson Chi-Square test was used to compare the proportion difference between the two groups. A p-value of ≤ 0.05 was considered statistically significant.

**RESULTS:**

Out of a total of 90 participants, 37 were interns and 53 PGs (9 were first year PGs, 13 were second year PGs, and 31 were final year PGs). The details of the study participants are provided in table 1.

**Table 1. Characteristics of the study participants.**

Characteristics		Number	Percentage
Total participants		90	100
Interns		37	41.1
Pgs		53	58.9
Sex :			
Interns	Males	12	32.4
	Females	25	67.6
Pgs	Males	41	77.4
	Females	12	22.6

Mean Age :		
Interns	22.14±3.33	
Pgs	27.45± 3.33	
Postgraduates:		
Non-clinical	11	20.8
Clinical	42	79.2
Specialities: PGs		
General Medicine	13	24.52
Pathology	8	15.09
Respiratory Medicine	8	15.09
Surgery	6	11.32
ENT	6	11.32
Anaesthesia	3	5.66
Paediatrics	2	3.77
SPM	3	5.66
Others	4	7.54

**Routine source of information on tuberculosis**

More than 50 % participants (19 interns and 30 postgraduates) claimed that they acquired knowledge from the internet. Around 25% of PGs obtained knowledge from Continuing medical education programmes and 25% of interns from journals.

**Knowledge on symptoms of PTB**

The five cardinal symptoms of tuberculosis are cough with or without expectoration, fever (evening rise of temperature), night sweats, hemoptysis and weight loss<sup>6</sup>. Participants were evaluated as mentioned in the methodology.

Among 37 Interns, 2 (5.4%) had poor knowledge, 12(32.4%) had fair knowledge and 23 (62.2%) had good knowledge. Among 53 PGs, 8(15.1%) had fair knowledge and 40 (75.5%) had good knowledge. Only 5 (9.4%) PGs mentioned all the symptoms and were categorized as excellent.

There was a significant difference between interns and postgraduates (p-value = 0.02)

**Knowledge on confirmatory test of PTB**

More than 90% of interns and postgraduate students mentioned sputum AFB smear as the confirmatory test among the choices provided.

**Knowledge on number of sputum samples for confirmation of PTB**

More than 70% (n=26) of interns and 80% (n=45) of PGs answered this correctly (2 smears). However, about 30% (n=11) of interns and 20% (n=8) of PGs answered wrongly.

**Expansion of DOTS**

More than 90% of interns and PGs correctly mentioned the DOTS expansion (directly observed therapy of short course), whereas 3(8.1%) interns and 2(3.3%) PGs answered wrongly.

**Knowledge on first-line drugs under DOTS**

29 (78.4%) interns and 43 (81.1%) PGs stated all the 5 first-line drugs (isoniazid, rifampicin, pyrazinamide, ethambutol and streptomycin). Eight (21.6%) interns and 10 (18.9%) PGs did not state all the first line drugs included in the regimen.

**Knowledge on number of treatment categories**

More than 80% (n=31) of interns and PGs (n=44) answered the number of treatment categories under RNTCP 2016 guidelines (2 categories).

**Duration of treatment in each category of DOTS therapy.**

Twelve (32.4%) interns and 21(39.6%) PGs answered correctly (category I duration is 6 months and category II is 8 months). Eight (21.6%) interns and 5(9.4%) PGs did not attempt the question. 17(45.9%) interns and 27(50.9%) PGs stated the wrong duration of treatment for each category.

**Drugs used in each category of DOTS therapy.**

Twenty (37.7%) PGs and 9(24.3%) interns mentioned all the

drugs used in both the categories correctly (category I- isoniazid, rifampicin, pyrazinamide, ethambutol and category II – category I + streptomycin). Thirteen (24.5%) PGs and 12(32.4%) interns gave an incorrect response. 20 (37.7%) PGs and 16 (43.2%) interns did not attempt this question.

**Knowledge of investigations during follow-up on antitubercular treatment**

25 (47.2%) PGs and 10 (27%) interns answered correctly (sputum smear on follow up). 28 (52.8%) PGs and 27(73%) interns answered wrongly.

**Knowledge of interval for investigations during follow up under category I antitubercular treatment**

More than 50% of interns and PGs gave the correct answer (follow up investigations at 2<sup>nd</sup> month and 6<sup>th</sup> month) whereas 12 (4.3%) interns and 13 PGs (4.3%) gave an incorrect response.

**Knowledge on the priority of investigations while evaluating patients with suspected pulmonary tuberculosis**

75% (40) of PGs and 45% (17) of interns mentioned sputum AFB examination as the first choice of investigation which is the correct answer, whereas 24.3% (n=9) of interns mentioned chest x-ray as the first investigation of choice, 1(2.7%) intern and 3(5.7%) PGs had mentioned Quantiferon TB gold as the first investigation of choice. Statistical analysis showed the significant difference of 0.024 among interns and PGs.

**Screening for diabetes mellitus in patients with tuberculosis**

18 (48.6%) interns and 36 (67.9%) PGs answered correctly (mandatory screening for all patients). However, 14(37.8%) interns and 12(22.6%) PGs gave the wrong answer (screen only in the presence of family history of diabetes mellitus).

**Screening for HIV in patients with tuberculosis**

94% (50) of PGs and 51 % (19) of interns mentioned that HIV screening is mandatory for all tuberculosis patients, whereas 15(40.5%) interns were wrong. The difference was highly significant (p-value = 0.0001)

**Notification of TB cases in India**

More than 95% of PGs and 85% of interns answered correctly that all cases of tuberculosis have to be notified to the appropriate authorities.

**Knowledge of MDR-TB definition**

30 (56.6%) PGs and 6 (16.2%) interns gave the correct answer, but 23 (43.4%) PGs and 31 (83.8%) interns did not provide the correct definition.

**Knowledge of XDR-TB definition**

11(20.8%) PGs and 1(2.7%) intern provided the correct definition of XDR-TB. 42(79.2%) PGs and 34 (91.9%) interns gave the wrong answer whereas 2 (5.4%) did not attempt the question.

**Regimen followed as per RNTCP 2016**

This was a multiple choice question type. 19 (35.8%) PGs and 4(10.8%) interns gave the correct answer. 34(64.2%) PGs and 32(86.5%) interns answered wrong & one intern did not mention any. (p-value = 0.016)

**Knowledge of drugs given in continuation phase CAT-1 DOTS as per RNTCP 2016**

9 (17%) PGs and 6(16.2%) interns answered correctly (Isoniazid, rifampicin, and ethambutol). More than 80% of participants were wrong.

**Safe drug in liver disease**

Around 60% of interns and PGs answered correctly (streptomycin) whereas 13 (35.1%) interns and 20 (37.7%) PGs answered incorrectly while 2(5.4%) interns and 1(1.9%) PGs did not attempt the question.

Summary of questions showing the significant difference between interns and PGs are listed in table 2.

**Table 2. Summary of questions showing the significant difference between Interns and PGs.**

S. No	Questions	Number of correct responses		p-value
		INTERNS n (%)	Pgs n (%)	
1.	5 cardinal symptoms of tuberculosis	Excellent	0 (0)	0.02
		Good	23(62.2)	
2.	Order of preference of investigation to evaluate a suspected PTB patient- sputum AFB the first choice	17(45)	40(75)	0.024
3.	Screening for HIV in tuberculosis patient	19(51)	50(94)	0.0001
4.	MDR TB definition	6(16.2)	30(57)	0.001
5.	XDR TB definition	1(2.7)	11(21)	0.014
6.	RNTCP 2016 – regimen followed	4(10.8)	19(36)	0.016

**DISCUSSION:**

India has one of the largest numbers of tuberculosis patients in the world<sup>7</sup>. According to recent studies, tuberculosis is a major public health problem in India with a high prevalence of 2.5 million as per 2015 report<sup>8</sup>. Proper awareness along with good knowledge of this major health problem among treating physicians will lead to improved management and effective tuberculosis control<sup>8</sup>.

A study done by Dinesh Mehta et al<sup>9</sup> on the knowledge about tuberculosis management and national tuberculosis program among medical students in Haryana, India, revealed low level of knowledge amongst interns. The number of sputum specimen required for diagnosis under RNTCP was responded correctly by only 57% in their study, while in our study more than 70% (26) of interns and 80% (45) of PGs had given the correct answer. Similarly, in an awareness study done by Sangeetha et al<sup>10</sup> among aspiring doctors in a medical college hospital in Tamil Nadu, India showed that 78.7% doctors had correct knowledge regarding the number of sputum samples required.

In a study done by Rahul et al<sup>11</sup> on knowledge of tuberculosis among postgraduate medical students in Pune, India revealed that 69% postgraduates knew the correct definition of MDR-TB while in our study, 56.6% PGs and only 16.2% interns were able to give the correct definition of MDR-TB. With rising antibiotic resistance, the prevalence of MDR and XDR TB pose a major challenge in eliminating TB, and our study shows that knowledge regarding MDR (p=0.001) and XDR TB (p=0.014) was extremely poor amongst interns when compared to postgraduates.

To the best of our knowledge, till date, no study has compared knowledge about tuberculosis between interns and postgraduates. In a similar comparative study between medical students and nurses done by Sunita et al<sup>12</sup>, they concluded that medical students possessed more knowledge. In our study, we found that knowledge about tuberculosis amongst PGs was better than interns.

In a study done by Ying Zhao et al<sup>13</sup> on a survey of TB knowledge among medical students in Southwest China, they showed that less than 10% were able to identify all the TB symptoms, while in our study 9.4% PGs were able to answer all symptoms of TB while none of the interns were able to answer all the 5 cardinal symptoms. The question related to 5 cardinal symptoms of PTB showed that interns had less knowledge compared to postgraduates(p-value= 0.02). In their study, it was found that most of the medical students obtained knowledge on TB from textbooks, while our study showed that more than 50% of the participants depended on the internet to obtain knowledge.

With recent advances and updates in diagnosis and treatment of TB, our study showed that interns had less knowledge compared to postgraduates regarding RNTCP 2016 guidelines, which was statistically significant (p value= 0.016).

Our study revealed that interns had very poor knowledge regarding mandatory screening for HIV in patients with tuberculosis when compared to postgraduates (p-value = 0.0001).

**CONCLUSION:**

Knowledge and awareness of tuberculosis diagnosis and management especially amongst interns are poor which may have important public health implications. It might be prudent to include routine RNTCP training in the curriculum of teaching institutions. Enhancement of knowledge regarding tuberculosis management and updated guidelines should be imparted on a regular basis to interns and postgraduates.

**References**

1. "Global tuberculosis report". World Health Organization. Retrieved 2017-11-09.
2. Park K. Textbook of Preventive and Social Medicine, 20th ed. Jabalpur: Banarsidas Bhanot Publishers; 2009.p.160
3. Available at //tbcindia.gov.in/
4. Available at http://www.who.int/mediacentre/factsheets/fs104/en/
5. Sunderlal Textbook of Community Medicine, 2nd ed. India: Sathish Kumar Jain; 2009.p.424.
6. "Tuberculosis Fact Sheet No 104". WHO. October 2015. Archived from the original on 23 August 2012. Retrieved 11 February 2016.
7. "Global tuberculosis control". WHO report. WHO/HTM/TB/2006.362. Geneva: World Health Organization, 2006.
8. Bhebhe LT, Van Rooyen C, Steinberg WJ. Attitudes, knowledge, and practices of healthcare workers regarding occupational exposure of pulmonary tuberculosis. Afr J Prm Healthcare Fam Med. 2014; 6(1), Art. #597, 6 pages.
9. Dinesh Mehta, Rishabh Bassi, Manjeet Singh, Chavi Mehta. To study the knowledge about tuberculosis management and national tuberculosis program among medical students and aspiring doctors in a high tubercular endemic country. Annals of Tropical Medicine and Public Health 2012; 5(3): 206-208.
10. S. Sangeetha Balamurugan, Swaminathan, Sivaji Rao. The Awareness about Tuberculosis and DOTS among the Aspiring Doctors in a Tertiary Medical College Hospital, Salem, Tamil Nadu. National Journal of Research in Community Medicine. Vol. 2. Issue 2. July-Sep. 2013 (079-148).
11. Rahul R Bogam, Sunil M Sagare. Knowledge of tuberculosis and its management practices amongst postgraduate medical students in Pune city. NATIONAL JOURNAL OF COMMUNITY MEDICINE 2011 Volume 2 Issue 1, ISSN: 0976 3325.
12. Sunita Bhandari & Rajesh Bande; Knowledge, Attitude and Practice against Tuberculosis Infection Control among Medical Students and Nursing Staff.
13. 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. doi:10.1136/bmjopen-2013-003454.