



ISSN: 0975-833X

RESEARCH ARTICLE

ASSESSMENT OF KNOWLEDGE REGARDING TUBERCULOSIS AMONG HEALTH CARE PROFESSIONALS AT A TERTIARY CARE HOSPITAL IN NORTH INDIA

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ARTICLE INFO

Article History:

Received 20<sup>th</sup> March, 2015  
Received in revised form  
07<sup>th</sup> April, 2015  
Accepted 15<sup>th</sup> May, 2015  
Published online 27<sup>th</sup> June, 2015

Key words:

Health care professionals,  
Tuberculosis,  
Knowledge,  
RNTCP,  
DOTS.

ABSTRACT

**Background:** Tuberculosis (TB) is a treatable and curable disease. Junior doctors and nurses working in health-care settings are often the first to identify and manage TB cases. Hence, a thorough knowledge regarding TB disease and its management under Revised National Tuberculosis Control Programme (RNTCP), and recent guidelines on Directly Observed Treatment Shortcourse (DOTS) strategy is crucial for health care professionals.

**Objectives:** To assess the knowledge regarding tuberculosis, RNTCP and DOTS among health care professionals at a tertiary care hospital.

**Methodology:** This cross-sectional, observational, descriptive, and institution based study was done among health care professionals in a tertiary care hospital.

**Results:** Out of 183 participants, 47.5% were junior doctors and 52.5% were nursing staffs. 79.3% of junior doctors and 58.3% of nursing staffs had good knowledge of tuberculosis. 96.6% of junior doctors had received training on RNTCP. 65.5% of junior doctors and 55.2% of nursing staffs had good knowledge regarding treatment monitoring and follow-up of patients.

**Conclusion:** Junior doctors and nursing staffs had a good knowledge regarding TB and recent RNTCP guidelines. RNTCP sensitization should be the part of regular activity of all medical colleges and hospitals to train the health care professionals.

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**Citation:** Siraj Ahmad, Mazher Maqsood, Hepsi Natha and Mohd. Izharulhak, 2015. "Assessment of knowledge regarding tuberculosis among health care professionals at a tertiary care hospital in North India", *International Journal of Current Research*, 7, (6), 16939-16943.

INTRODUCTION

Tuberculosis (TB) occurs in every part of the world. India is the highest TB burden country in the world in terms of absolute number of cases that occur each year. In 2013, largest number (56%) of new TB cases occurred in the South-East Asia and Western Pacific Regions, with India alone accounting for one-fourth of the estimated global TB cases (Park, 2015). TB is a treatable and curable disease. Vast majority of TB cases can be cured when medicines are provided and taken properly. Since 1993, the Government of India has been implementing the WHO recommended Directly Observed Treatment Shortcourse (DOTS) strategy through the Revised National Tuberculosis Control Programme (RNTCP).

DOTS strategy expanded in a phased manner to cover the entire country in 2005 (RNTCP Training Module for Medical Practitioners, 2010). In this strategy, active drug-sensitive TB disease is treated with a standard six-month course of antimicrobial drugs that are provided with information, supervision and support to the patient by a health worker or trained volunteer. Without such supervision and support, treatment adherence can be difficult and the disease can spread. Drug resistance, diabetes, smoking and other associated factors complicate TB scenario further making it difficult to control (TB INDIA, 2012). The long-term goal for RNTCP is to reach and sustain a situation where health care staffs at different levels of the health system has the skills, knowledge and attitudes to successfully implement and sustain DOTS activities and thereby control the disease effectively (RNTCP DOTS-Plus Guidelines, 2010).

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Early detection is essential to ensure an effective TB control. Junior doctors (medical interns and junior residents) and nurses working in health-care settings are often the first to identify and manage suspected TB cases as they take care of the entire spectrum of activities, including case detection, administering and monitoring drug regimens, ensuring a regular supply of medicines, recording and reporting systems. Junior doctors and nurses are responsible for educating and supporting patients with TB, detecting medication side effects, ensuring adherence to and completion of treatment. They have a role in educating and supporting patients at home through follow-up clinics. They are also responsible for screening those who have been in close contact with patients with infectious TB. Hence, a thorough knowledge regarding TB disease, RNTCP, and the current guidelines of DOTS strategy, is crucial for health care professional working in tertiary care hospitals. Some studies in India have documented inadequate TB knowledge among practicing physicians (Baxi and Shah, 2006; Yadav *et al.*, 2006; Dasgupta and Chattopadhyay, 2010; Datta *et al.*, 2010; Khadse *et al.*, 2011). Few studies done among medical interns and post graduate medical students in our country showed inadequate knowledge of TB (Rajpal *et al.*, 2007; Bogam and Sagare, 2011; Kutare *et al.*, 2012; Mehta *et al.*, 2012). With this background, the present study was done to assess the knowledge regarding TB, RNTCP and DOTS strategy among the junior doctors and nursing staffs of a tertiary care hospital in North India.

## MATERIALS AND METHODS

**Study Design:** This cross-sectional, observational, descriptive, and institution based study was done among junior doctors and nursing staffs. Institutional research and ethical approval was obtained and the study was conducted in April, 2015.

**Sampling technique:** Purposive sampling was done.

**Study Material:** Junior doctors and nursing staffs working at the hospital during the study period.

**Inclusion criteria:** Those junior doctors and nursing staff willing to participate in the study and were present on that day of data collection.

**Exclusion criteria:** Those not willing to participate and absent on the day of data collection.

**Study subjects:** A total of 183 health care professionals consisting of junior doctors and nursing staffs were selected for the study.

**Method:** Informed consent was obtained from the participants after explaining the purpose of study. The anonymity of the participants was maintained throughout the study. Study tool was an English language, pre-designed, pre-tested, self-administered semi-structured questionnaire containing both open ended and close ended questions. Information was sought from participants to assess the knowledge regarding TB, RNTCP and DOTS. The questionnaire had 24 questions consisting of 6 questions related to knowledge about TB disease, 6 questions regarding RNTCP and its guidelines, 6

questions on new DOTS guidelines, and 6 questions on treatment monitoring and follow-up of TB patients. Each question was allotted one score for correct answer and the level of knowledge was assessed on the basis of the score obtained by the participant. The score was graded as poor (0 – 2), satisfactory (3 – 4), and good (5 – 6).

**Statistical analysis:** Data from the interview schedule was transferred to a computer. The SPSS Data Editor Software version 19 was used for analysis of the data. Chi-square test was performed and  $p$  value  $\leq 0.05$  were considered statistically significant.

## RESULTS

Total 183 participants were included in the study. 38.8% were males and 61.2% were females. The mean age of participants was  $31.99 \pm 8.27$  years. Majority of the participants (42.8%) were in the age group of 20 – 29 years (Table 1).

**Table 1. Distribution of participants according to age and sex**

Age (in years)	Male	Female	Total
20 - 29	47 (43.5%)	61 (56.5%)	108 (100%)
30 - 39	13 (32.5%)	27 (67.5%)	40 (100%)
40 - 49	6 (26.1%)	17 (73.9%)	23 (100%)
50 - 59	5 (41.7%)	7 (58.3%)	12 (100%)
Total	71 (38.8%)	112 (61.2%)	183 (100%)

$\chi^2 = 3.288$ ;  $df = 3$ ;  $p = 0.349$

$\chi^2 =$  Chi-Square test;  $df =$  degree of freedom.  $p < 0.05$  was considered as statistically significant.

Among the 183 participants, 87 (47.5%) were junior doctors, and 96 (52.5%) were nursing staffs. Among the junior doctors 96.6% had received training on RNTCP. Among the nursing staffs 81.2% had received training on RNTCP. This was statistically significant (Table 2).

**Table 2. Distribution of participants according to RNTCP training status**

Participants	RNTCP Training received		Total
	YES	NO	
Junior doctors	84 (96.6%)	3 (3.4%)	87 (100%)
Nursing staffs	78 (81.2%)	18 (18.8%)	96 (100%)
Total	162 (88.5%)	21 (11.5%)	183 (100%)

$\chi^2 = 10.519$ ;  $df = 1$ ;  $p = 0.001$

RNTCP = Revised National Tuberculosis Control Programme  
 $\chi^2 =$  Chi-Square test;  $df =$  degree of freedom.  $p < 0.05$  was considered as statistically significant.

Among the junior doctors 79.3% had good knowledge and 16.1% had average knowledge of tuberculosis disease. Among the nursing staffs 58.3% had good knowledge and 25.0% had average knowledge of tuberculosis disease. This was statistically significant (Table 3).

**Table 3. Assessment of knowledge about tuberculosis disease**

Participants	Knowledge about tuberculosis disease			Total
	Good	Satisfactory	Poor	
Junior doctors	69 (79.3%)	14 (16.1%)	4 (4.6%)	87 (100%)
Nursing staffs	56 (58.3%)	24 (25.0%)	16 (16.7%)	96 (100%)
Total	125 (68.3%)	38 (20.8%)	20 (10.9%)	183 (100%)

$\chi^2 = 10.767$ ;  $df = 2$ ;  $p = 0.005$

$\chi^2 =$  Chi-Square test;  $df =$  degree of freedom.  $p < 0.05$  was considered as statistically significant.

Among the junior doctors 71.3% had good knowledge and 21.8% had average knowledge regarding diagnosis of tuberculosis under RNTCP. Among the nursing staffs 53.1% had good knowledge and 24.0% had average knowledge regarding diagnosis of tuberculosis under RNTCP. This was statistically significant (Table 4).

**Table 4. Assessment of knowledge about tuberculosis diagnosis under RNTCP**

Participants	Knowledge of tuberculosis diagnosis under RNTCP			Total
	Good	Satisfactory	Poor	
Junior doctors	62 (71.3%)	19 (21.8%)	6 (6.9%)	87 (100%)
Nursing staffs	51 (53.1%)	23 (24.0%)	22 (22.9%)	96 (100%)
Total	113 (61.7%)	42 (23.0%)	28 (15.3%)	183 (100%)

$\chi^2 = 10.177$ ;  $df = 2$ ;  $p = 0.006$

RNTCP = Revised National Tuberculosis Control Programme  
 $\chi^2$  = Chi-Square test;  $df$  = degree of freedom.  $p < 0.05$  was considered as statistically significant.

Among the junior doctors 72.4% had good knowledge and 21.8% had average knowledge regarding DOTS under RNTCP. Among the nursing staffs 54.2% had good knowledge and 26.0% had average knowledge regarding DOTS under RNTCP. This was statistically significant (Table 5).

**Table 5. Assessment of knowledge about DOTS guidelines under RNTCP**

Participants	Knowledge about DOTS under RNTCP			Total
	Good	Satisfactory	Poor	
Junior doctors	63 (72.4%)	19 (21.8%)	5 (5.7%)	87 (100%)
Nursing staffs	52 (54.2%)	25 (26.0%)	19 (19.8%)	96 (100%)
Total	115 (62.8%)	44 (24.0%)	24 (13.1%)	183 (100%)

$\chi^2 = 9.618$ ;  $df = 2$ ;  $p = 0.008$

RNTCP = Revised National Tuberculosis Control Programme.  
 DOTS = Directly Observed Treatment Short Course  
 $\chi^2$  = Chi-Square test;  $df$  = degree of freedom.  $p < 0.05$  was considered as statistically significant.

Among the junior doctors 65.5% had good knowledge and 26.4% had average knowledge regarding treatment monitoring and follow-up of TB patients. Among the nursing staffs 55.2% had good knowledge and 21.9% had average knowledge regarding treatment monitoring and follow-up of TB patients. This was statistically significant (Table 6).

**Table 6. Assessment of knowledge about treatment monitoring and follow-up of TB patients under RNTCP**

Participants	Knowledge of treatment monitoring and follow-up of TB patients under RNTCP			Total
	Good	Satisfactory	Poor	
Junior doctors	57 (65.5%)	23 (26.4%)	7 (8.0%)	87 (100%)
Nursing staffs	53 (55.2%)	21 (21.9%)	22 (22.9%)	96 (100%)
Total	110 (60.1%)	44 (24.0%)	29 (15.8%)	183 (100%)

$\chi^2 = 7.571$ ;  $df = 2$ ;  $p = 0.023$

RNTCP = Revised National Tuberculosis Control Programme  
 $\chi^2$  = Chi-Square test;  $df$  = degree of freedom.  $p < 0.05$  was considered as statistically significant.

## DISCUSSION

Revised National Tuberculosis Control Programme (RNTCP) gives more emphasis on health education, patient counselling

and directly observed treatment shortcourse (DOTS). Tuberculosis treatment is usually domiciliary, but in case of admission in a tertiary care hospital, the patients are in prolonged contact with junior doctors and nurses. Junior doctors and nurses are usually responsible for carrying out routine investigations, treatment management and discharge of patients from the wards. Consequently, the responsibilities of nurses and other paramedical staff have also increased many folds. The patient's queries about the disease during their hospital stay such as mode of spread, prevention, and protection of family members, are often answered by the junior doctors and nurses as they are more readily available than the physicians (Singla *et al.*, 1998).

In our study 96.6% of the junior doctors and 81.2% of the nursing staffs had received training in RNTCP in the form of lectures, group discussions, seminars, and workshops. In a study, 61.7 % of surveyed doctors had received modular training on RNTCP (Basu *et al.*, 2013), which was similar to another study among physicians (Vandan *et al.*, 2008). Studies by Datta *et al.* (2010) and Majumdar *et al.* (2012) have reported low level of training in RNTCP as 22.0% and 11.0% respectively.

The present study showed that junior doctors (79.3%) and nursing staffs (58.3%) had good knowledge regarding TB disease. Khan *et al.* (2005) in their study on medical intern's knowledge of TB found that, 96% correctly mentioned the mode of transmission of TB. Busari *et al.* (2008) observed in their study on Knowledge of tuberculosis among medical interns that, 88.1% correctly mentioned the mode of TB transmission. In a study done by Singla *et al.* (1998) showed that substantial number of nurses had inadequate knowledge regarding various aspects of TB disease. Rajpal *et al.* (2007) noted in their study that only 4.2% of the interns had correct knowledge about modes of transmission of TB. Akin *et al.* (2011) reported in their study that the nursing students had poor knowledge about TB.

In our study 71.3% junior doctors had good knowledge and 53.1% nurses had good knowledge regarding diagnosis of TB under RNTCP guidelines. This indicates adequate training of junior doctors during their MBBS course and an adequate RNTCP training conducted for nurses. Rajpal *et al.* (2007) and Aggarwal *et al.* (2011) observed in their study that 65.9% of interns correctly mentioned RNTCP guidelines diagnosing TB. Bogum and Sagare reported correct knowledge about RNTCP guidelines in 86.1% of first year postgraduates after imparting training (Bogum and Sagare, 2011). However, other studies showed that physicians, medical interns and post graduate students had inadequate knowledge about the presenting symptoms of TB (Baxi and Shah, 2006; Yadav *et al.*, 2006; Rajpal *et al.*, 2007; Bogum and Sagare, 2011). Baveja and Dalal reported that only 47% of medical interns had correct knowledge about number of sputum samples required for diagnosis of smear positive case (Baveja and Dalal, 2012). A study conducted in Malaysia revealed that 37.1% knew that tuberculosis is associated with cough (Koay, 2004). Likewise, a study in China reported only 15.1% of participants knew that prolonged cough is associated with tuberculosis (Lu *et al.*, 2009).

In our study 72.4% junior doctors had good knowledge regarding the DOTS guidelines as compared to 54.2% nurses who had good knowledge. This shows the need for update of knowledge and practical approach in training the nurses. In a study Mehta *et al* found that correct knowledge regarding DOTS was seen in 56.0% of medical interns (Mehta *et al.*, 2012). In a study at Kolkata 29.2%, and in another study at Delhi 26.5% of the general practitioners knew that the treatment for TB was given in two phases, intensive phase (IP) and continuation phase (CP) (Dasgupta and Chattopadhyay, 2010; Rajpal *et al.*, 2007). Other studies conducted in North India, Pune and Pakistan, about the prescribing behaviour of interns and postgraduate students reported similar findings (Mehta *et al.*, 2012; Bogam and Sagare, 2011; Khan *et al.*, 2005). In the present study both junior doctors (65.5%) and nurses (55.2%) had good knowledge regarding treatment monitoring and follow-up. In a study 56.5% of the junior doctors were aware of sputum microscopy for AFB as a monitoring tool (Basu and Das, 2014). In another study among private practitioners, 40.0% used smear microscopy as a tool for treatment monitoring and 68.3 % were aware of the fact that Isoniazid (INH) prophylaxis should be given to under 6 children in contact with active tuberculosis as per RNTCP guidelines (Basu *et al.*, 2013). Some other studies also reported similar findings (Datta *et al.*, 2010; Kumar *et al.*, 2011; Srivastava *et al.* 2011). A study reported that 56.7% of the participants suggested avoiding streptomycin if a woman becomes pregnant while on anti-TB treatment (Basu *et al.*, 2013), which was similar to other studies done in Kolkata and Pakistan (Dasgupta and Chattopadhyay, 2010; Rizvi and Hussain, 2001). A study reported that 51.7% of private practitioners knew the drugs to be stopped during jaundice (Basu *et al.*, 2013). A similar study reported that 46.4% of the general practitioners were aware of drugs to be stopped during jaundice (Dasgupta and Chattopadhyay, 2010).

### Conclusion and Recommendations

The level of knowledge regarding TB and RNTCP guidelines amongst the junior doctors and nurses was good. In order to treat patients according to the objectives of the RNTCP programme demands better teaching practices for the medical undergraduates and training programmes for nurses. RNTCP sensitization should be the part of regular activity of all medical colleges and hospitals. Methodologies like role play, demonstration, question- answer session, setting up various examples, film show, printed handouts, posters, and group discussion should be adopted to educate students about RNTCP programme.

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