



Original Research Article

## Knowledge and Attitude of DOT Providers and Treatment Outcome of TB Patients of Tuberculosis Unit, Patiala

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### ABSTRACT

#### Aims and Objectives:

1. To test the knowledge about RNTCP among the DOT Providers.
2. To know the attitude of the DOT Providers and their beliefs regarding the tuberculosis and the treatment.
3. To see the treatment outcome of TB patients and the problems faced by the DOT Providers.

**Material and Methods:** The study was conducted in one of the Tuberculosis Units of district Patiala TB centre i.e. TU Patiala. There are 25 Government DOT centres in T.U. Patiala & there were 52 DOT providers in these centres including pharmacists, nurses, MPHWF, class IV, treatment organizer & radiographer. Out of 52 DOT providers, 50 gave consent for study. A pre-tested questionnaire was used to collect the relevant information from all the DOT providers. The questionnaire consisted of questions regarding their knowledge and attitude about Tuberculosis, RNTCP and DOTS. Their beliefs and perceptions regarding TB were also asked. The information regarding the TB patients registered from July 2008 to September 2008 and their treatment outcome was collected. The data collected from all the DOT providers was compiled and analyzed and the results are discussed after applying suitable statistical methods in the observation and discussion part.

**Results and Conclusions:** After assessing the knowledge and attitude of DOT providers regarding Tuberculosis various gaps were found. The study highlights the need to impart the training to DOT providers before they start giving DOTS therapy. Reorientation courses should be organized periodically to update the knowledge of DOT providers regarding the TB disease, its diagnosis, treatment and follow up of patients. Constant monitoring and supervision is required by trained staff in Tuberculosis Unit.

**Key Words:** DOT Provider, RNTCP, Knowledge And Attitude

### INTRODUCTION

Tuberculosis is an airborne infectious disease, caused by infection of bacteria, called *Mycobacterium tuberculosis* (MTB). It is most commonly found in the

lungs (70%) known as pulmonary Tuberculosis or in any other part of the body (30%) referred to as extra-pulmonary Tuberculosis. Tuberculosis is spread from

person to person by droplet nuclei from people with pulmonary or respiratory TB during expiratory action such as coughing, sneezing or singing and inhaled by a susceptible contact. <sup>(1)</sup> It has been estimated that three million people die from tuberculosis in the world each year. <sup>(2)</sup> Globally it is estimated that one third of the population is infected with TB, and as a consequence, at risk of developing active disease. Each year, more than 8 million people develop disease and there are approximately 1.9 million deaths ever. Amongst these deaths, 90% occur in developing countries and disproportionately 75% occurs amongst the 15 - 54 age groups. This has a negative effect on the economy because this group contributes greatly to the workforce. <sup>(3)</sup> Though India is the second-most populous country in the world, India has more new TB cases annually than any other country. In 2011, out of the estimated global annual incidence of 9 million TB cases, 2.3 million were estimated to have occurred in India. <sup>(4)</sup>

India had a national Tuberculosis programme (NTP) in operation since 1962. After initial success, programme didn't attain the achievements that it promised. Through it only 1/3<sup>rd</sup> of total patients receiving treatment used to complete the treatment. <sup>(5)</sup>

Govt. of India (GoI) decided to pilot test RNTCP in 1993. RNTCP was pilot tested in 1993 as phase-I project covering population of 118 million. <sup>(6)</sup> After a successful pilot in 1993 which established the technical and operational feasibility of strategy, expansion of DOTS services took place on a larger scale in India from 1997. The past eleven years have witnessed a rapid expansion of RNTCP, covering whole nation by March, 2006. Compliance is a major problem for tuberculosis control programme. It is not possible to predict a defaulter. Therefore to overcome the

problem of default by patient, direct observation of the treatment is of paramount importance.

In DOT, an observer (health worker or a trained community volunteer who is not a family member) watches and supports the patients taking drugs. It is this DOT provider who ensures that the patient takes right drugs in right doses at right interval for right duration. DOT providers should be accessible, acceptable and accountable. <sup>(7)</sup>

The information and education provided by the health care worker and the subsequent relationship of the TB client and their provider is an essential component in the successful treatment of the disease. <sup>(8)</sup>

Compliance to therapy is one of the important factors that affect the outcome of therapy. Compliance can be defined as the extent to which a patient's behavior coincides with medical advice. Non-compliance to self administered multi-drug tuberculosis treatment regimens is common and most important cause of failure of initial therapy and relapse. Non-compliance may also result in acquired drug resistance, requiring more prolong and expensive therapy that is less likely to be successful than the treatment of drug susceptible tuberculosis. The adoption of DOT has been associated with reduced rate of treatment failure, relapse and drug resistance. <sup>(9,10)</sup>

DOT training needs to be imparted to the treatment providers and health personnel of both public as well as private sectors through perusal of training strategies for individual categories of trainees. Existing training limitations need to be resolved. Key training players have played a vital role in initiating the DOTS training process all over country and need to sustain the efforts. Both training and research complement each other and need encouragement for the effective TB control. <sup>(11)</sup>

### ***Aims and Objectives***

The present study was conducted with the following aims and objectives:

- To test the knowledge about RNTCP among the DOT Providers.
- To know the attitude of the DOT Providers and their beliefs regarding the tuberculosis and the treatment.
- To see the treatment outcome of TB patients and the problems faced by the DOT Providers.

### **MATERIALS AND METHODS**

The study was conducted in district TB Centre Patiala. There are 4 Tuberculosis Units (TU) in districts TB Centre Patiala which are: TU Patiala, TU Nabha, TU Samana, TU Rajpura. The study was conducted in one of the Tuberculosis Units of district Patiala TB centre i.e. TU Patiala. There are 25 Government DOT centres in T.U. Patiala & there were 52 DOT providers in these centres including pharmacists, nurses, MPHWF, class IV, treatment organizer & radiographer. Out of 52 DOT providers, 50 gave consent for study. A pre-tested questionnaire was used to collect the relevant information from all the DOT providers. The questionnaire consisted of questions regarding their knowledge and attitude about Tuberculosis, RNTCP and DOTS. Their beliefs and perceptions regarding TB were also asked. The information regarding the TB patients registered from July 2008 to September 2008 and their treatment outcome was collected. The data collected from all the DOT providers was compiled and analyzed and the results are discussed after applying suitable statistical methods in the observation and discussion part.

### **RESULTS**

Out of 50 DOT providers 37 (74%) were females and 13 (26%) were males.

There were 21 (42%) MPHWF, 15 (30%) pharmacists, 5 (10%) nurses, 7 (14%) class IV, 1 (2%) radiographer and 1 (2%) treatment organizer. The mean age of the DOT providers was 40 years. The minimum age of the DOT providers was 25 years and maximum age was 52 years. 88% of DOT providers were in age group of 31-50 yrs. All the DOT providers were having work experience under RNTCP. Most of the DOT providers (90%) knew about the most common presentation of tuberculosis i.e. Pulmonary TB. All DOT providers had knowledge about spread of infection by droplets. But Simultaneously 16% DOT providers said that it can spread from mother to child and. Each of 8% DOT providers said that it can spread via feco-oral route and blood route respectively. All the DOT providers knew that cough with expectoration is the symptom of tuberculosis. Majority of the DOT providers i.e. 78% knew the other symptoms like, evening rise of temperature, blood in sputum, pain chest, weight loss or family history of tuberculosis.

According to 96% DOT provider, tuberculosis is more common in lower socio-economic status. Thirty nine (78%) DOT providers said that Sputum examination is the first line investigation to diagnose tuberculosis, while 9 (18%) said sputum examination with X-ray is done and they consisted of 4 pharmacists, 3 MPHWF and 2 class IV37 (74%) DOT providers said that 3 samples are needed to diagnose pulmonary tuberculosis, only 10 (20%) were aware about need of only two sputum samples according to new guidelines and 3 (6%) were not sure about this. 47 (94%) DOT providers knew that National Program for Tuberculosis followed at present is RNTCP (Revised National Tuberculosis Control Program). Only 32 (64%) DOT providers knew about full terminology of DOTS i.e. Directly Observed Treatment

Short-course & 36% did not know the correct terminology 42 (84%) out of 50 DOT provider had received training under RNTCP. Source of latest information about tuberculosis to DOT providers were health officials (78%), books (22%), seminars (10%), media (10%).

Forty six (92%) of the DOT providers knew that drugs in Intensive Phase are given in thrice weekly doses. On statistical analysis it was found that difference in the knowledge about treatment schedule between trained & untrained DOT Providers is highly significant with Chi-square = 6.49 (with Yates correction)  $p < 0.01$ . All the DOT providers had knowledge about duration of intensive phase of category I and III i.e. 2 months but 48 (96%) knew about duration of IP in category II treatment. correct duration of continuation Phase of treatment in category I, II and III was known to all the DOT providers. 36 (72%) DOT providers knew correctly about

follow up sputum examination in category I, 31 (62%) about category II and 35 (70%) about category III. On statistical analysis it was found that difference in the knowledge about Follow up Sputum Examination between trained & untrained DOT Providers is highly significant.

38 (76%) knew correct combination of drugs used in intensive phase of category I treatment. About continuation phase only 36 (72%) knew the correct combination of drugs. out of 50 DOT providers only 36 (72%) knew correct combination of drugs in intensive phase of cat II treatment. About drugs used in continuation phase of cat II treatment 32 (64%) were aware of correct combination of drugs. 36 (72%) DOT provides knew about correct combination of three drugs used in intensive phase of category III treatment and 32 (64%) knew correct combination of two drugs used in continuation phase of category III treatment.

**Table No.1 : KNOWLEDGE ABOUT VARIOUS SIDE EFFECTS OF ATT DRUGS**

DOT Provider (n=50)	Itching	Nausea	Vom-iting	Jaun-dice	Joint Pains	Vertigo	Visual Disturbance
Pharmacists	8	14	14	14	3	4	2
Nurses	4	5	4	4	3	3	3
MPHWF	11	16	17	12	6	6	4
Class IV	1	2	2	2	0	0	0
T/t Organizer	0	1	1	1	0	0	0
Radiographer	1	1	1	0	0	0	0
<b>Total</b>	<b>25 (50%)</b>	<b>39 (78%)</b>	<b>39 (78%)</b>	<b>33 (66%)</b>	<b>12 (24%)</b>	<b>13 (26%)</b>	<b>9 (18%)</b>

**Table No. 2: RESPONSE TO VARIOUS LEADINQUESTIONS**

DOT Provider (n=50)	Fear of contracting the disease	Work for incentive	T/t of TB Patient should be kept confidential	TB is a social stigma
	Y	Y	Y	Y
Pharmacists	2	0	11	3
Nurses	2	0	3	2
MPHWF	10	0	15	4
Class IV	6	0	6	5
T/t Organizer	0	0	1	1
Radiographer	0	0	1	1
<b>Total</b>	<b>20 (40%)</b>	<b>0</b>	<b>37(74%)</b>	<b>16 (32%)</b>

Only 23 (46%) DOT providers consider treatment failure case if patient is sputum positive at 5<sup>th</sup> month. 41(82%) out of 50 DOT providers said a patient is

labeled as defaulter if he/she is sputum positive after having left treatment for at least 2 months. 41 (82%) DOT provider knew that patient is labeled as a relapse

case, if he returns smear positive after completing treatment and had been declared cured.

33 (66%) DOT providers knew that urine colour will change on taking Rifampicin. Table no. 1 shows the knowledge about various side effects of ATT drugs. Most common reason told by DOT providers for default action of the patient was toxicity of drugs (52%) followed by improvement in symptoms (44%). Other reasons for default were change of address (24%), deterioration (12%) and affordability (8%). Table no. 2 and 3 shows the response

of DOT providers to various leading questions.

Health education given by DOT providers on various aspects of TB were: regarding regular treatment (98%), for taking good diet (94%), proper disposal of sputum (92%), covering of mouth while coughing (94%), personal hygiene (90%), cessation of alcohol and smoking (74%). As shown in table no.4 the treatment outcome in patients taking treatment from Private DOT Providers were not significantly different from the patients treated by the Government DOT Providers on statistical analysis.

**Table No. 3: RESPONSE TO VARIOUS LEADING QUESTIONS**

DOT Provider (n=50)	TB pt. should be isolated	TB pt. should use separate utensils	TB pt. should eat high protein diet	TB Pt. should stay at some hilly areas	Pt. respect you	Any difficulty in the provision of DOTs
	Y	Y	Y	Y	Y	Y
Pharmacists	3	4	7	0	7	1
Nurses	6	9	11	6	12	2
MPHWF	0	3	5	0	4	2
Class IV	10	15	19	3	17	5
T/t Organizer	1	2	3	1	3	0
Radiographer	1	1	1	1	3	1
<b>Total</b>	<b>21 (42%)</b>	<b>34 (68%)</b>	<b>46 (92%)</b>	<b>11 (22%)</b>	<b>46 (92%)</b>	<b>11(22%)</b>

**Table No. 4: TREATMENT OUTCOME OF T.B. PATIENTS**

	Cured	T/t Completed	Defaulted	Died	Transferred Out	Failure	Total
<b>Govt.</b>	75 (34.7%)	110 (51%)	10 (4.6%)	10 (4.6%)	3 (1.4%)	8 (3.7%)	216(78.5%)
<b>Private</b>	17 (28.8%)	26(44%)	5(8.5%)	5 (8.5%)	1(1.7%)	5 (8.5%)	59 (21.5%)
<b>Total</b>	<b>92 (34%)</b>	<b>136 (49.5%)</b>	<b>15 (5%)</b>	<b>15 (5%)</b>	<b>4 (1.4%)</b>	<b>13 (4.7%)</b>	<b>275</b>
<b>Chi-square : 5.70; d.f.: 5; p&gt;0.05 (Non significant)</b>							

## DISCUSSION

In the present study out of 50 DOT providers 37 (74%) were females and 13 (26%) were males. It could be due to more of the Multi Purpose Health Worker Females (MPHWF), who participated in the study.

The mean age of the DOT providers was 39.98 years with standard deviation of 6.09 years. Majority of them i.e. 52% were in age group of 31-40 years. This is similar to those reported by Arora et al. (12) in 2003 (50%) and Balambal. (13) in 2001 (57%). All the DOT providers knew that tuberculosis is

a curable disease. So in this study all the DOT providers were aware that TB is curable because all were having experience under RNTCP. Almost similar results were reported by Arora et al. (12) All DOT providers knew that TB spread by droplets but simultaneously 8 (16%) DOT providers said that it can spread from mother to child and they comprised 4 pharmacist and 4 MPHWF. Shehzadi et al. (14) in 2005 studied Knowledge regarding Tuberculosis among General Practitioners in Northern Areas of Pakistan and found that according to 77

respondents (87.5%), TB was a droplet infection.

In the present study all the DOT providers knew that cough with expectoration is the symptom of tuberculosis. In the KAP survey conducted by Hashim<sup>(15)</sup> 93.2% of health care workers mentioned that the presence of cough for more than 3 weeks should be one of the identifying criteria. It may be because all the DOT providers in our study were trained. 48 (96%) DOT provider, said that tuberculosis is more common in lower socio-economic status which is similar to the study conducted by Johansson et al.<sup>(16)</sup> in 1996 where staff and patients considered Tuberculosis a '**dirty disease**', which mainly affects poor people.

37 (74%) DOT providers said that 3 samples are needed to diagnose pulmonary tuberculosis, only 10 (20%) were aware about need of only two sputum samples according to new guidelines and 3 (6%) were not sure about this. Similarly Thakur et al.<sup>(17)</sup> in 2006 found in his study that 72% of the participants stated that 3 samples are required for diagnosis. In the present study it was found that forty six (92%) of the DOT providers knew that drugs in Intensive Phase are given in thrice weekly doses. While 100% knew that in Continuation Phase treatment is given daily (including pyridoxine). Similarly Balambal<sup>(13)</sup> also found in his study that 78 (80%) out of 97 DOT providers knew the treatment rhythm i.e intermittent during phase-I and daily during phase-II. In our study 38 (76%) knew correct combination of drugs used in intensive phase of category I treatment. About continuation phase only 36 (72%) knew the correct combination of drugs. Balambal<sup>(13)</sup> found that 72 (74%) out of 97 knew about drugs administered in each phase.

In the present study most common reason told by DOT providers for default

action of the patient was toxicity of drugs (52%) followed by improvement in symptoms (44%). Other reasons for default were change of address (24%), deterioration (12%) and affordability (8%). Similarly Pandit & Choudhary<sup>(18)</sup> observed that majority of patients on DOT stopped treatment because of toxicity of drugs. The other reasons were feeling better during treatment and lack of knowledge about various aspects of TB and its treatment. Tekle et al<sup>(19)</sup> also revealed in their study, medication side effects were significantly associated with defaulting.

In our study it was found that that 40% of DOT Providers had fear of contracting the disease, no DOT provider worked for incentives, 74% said that treatment of TB patient should be kept confidential. 32% said that TB is a social stigma. According to 42% TB patient should be isolated and according to 68% TB patient should use separate utensils. 92% said that TB patient should eat high protein diet. 92% said that the patients taking treatment respect them. Only 22% said that they had difficulty in provision of DOTS. These findings are consistent with the findings of Balambal<sup>(13)</sup> that none of the DOT providers worked for compensation. He also found that 72% feel that confidentiality in treatment is needed and only 32% of DOT providers confronted with problems like haemoptysis or breathlessness.

In our study it was found that out of total 275 patients, 92 (34%) were cured of disease. 136 (49.5%) completed their treatment, 15 (5%) defaulted & 15 (5%) died. 4 (1.4%) patients were transferred out & 13 (4.7%) were cases of treatment failure. This is almost similar to those reported by Anunnatsiri et al.<sup>(20)</sup> who studied the factors related to treatment outcomes in 226 smear-positive pulmonary tuberculosis adult Thai patients. In these patients, 31% had a cure or a completion of therapy. Similarly

Vasankari et al. <sup>(21)</sup> studied the Risk factors for poor tuberculosis treatment outcome in Finland and found that a favourable outcome was achieved in 441 (70.1%) of the cases, consisting of those cured 199 (31.6%) and treatment completed 242 (38.5%).

## CONCLUSIONS

The DOT provider's knowledge and attitude is very important in TB treatment. So there is a need to impart the training to DOT providers before they start giving DOTS therapy. Reorientation courses should be organized periodically to update the knowledge of DOT providers regarding the TB disease, its diagnosis, treatment and follow up of patients. Knowledge about new and retreatment cases should be given to them. Constant monitoring and supervision is required by trained staff in Tuberculosis Unit.

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