

# Perception of tuberculosis among general patients of tertiary care hospitals of Bengal

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## ABSTRACT

**Introduction:** Tuberculosis is a public health problem in India. The patients of Tuberculosis hide their disease from family, relatives, and community due to the presence of stigma. This study was conducted to assess the knowledge, awareness, and perception regarding social variables of tuberculosis among patients and to associate the awareness with their literacy status. **Materials and Methods:** Type of study was observational, descriptive, and epidemiological. Study design was cross-sectional. Study setting was general out-patient department of tertiary care hospitals of West Bengal. Sample size was 464 (Four hundred sixty four) patients. The collected data were tabulated, analyzed, and interpreted by proper statistical methods (by percentage and Z test). **Results:** 60.34% of study population was male. More than one third was illiterate (37.93%). Majority (91.38%) had heard about tuberculosis (TB). Correct answer on cause (infection) was responded by 16.81% patients. About 72.41% had heard about TB from an informal contact. The correct response on mode of spread of TB was told by 31.47% patients. About 62.07% correctly answered that cough was the commonest symptom. 82.76% knew about curability of the disease. Isolation of patient (08.62%) and avoidance of sharing of food (06.03%) were reported as preventive measures. The literacy status had a significant influence on awareness about TB. **Conclusion:** An attempt could be made in future to improve awareness among illiterates to remove myths and misconceptions, to allay the social stigma attached with it, to decrease TB transmission.

**KEY WORDS:** Awareness, general patients, literacy association, tuberculosis

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## INTRODUCTION

Tuberculosis is a public health problem in India, accounting for one fifth or 21% of the global incidence. It was estimated that almost 2 million incident cases were from India in 2009, among which 0.87 million cases were infectious. Moreover, in India, the estimate of MDR TB among new cases was 2-3% and among re-treatment cases, it was 14-17%. In 2009, TB patients with known HIV status was 17% and tested TB patients with HIV positive was 12%.<sup>[1]</sup> Revised National Tuberculosis Control Program (RNTCP) based

on the internationally recommended Directly Observed Therapy Short-course (DOTS) strategy was started as pilot in Oct 1993, launched in 1997, expanded across the country in a phased manner with support from World Bank. Full nationwide coverage was achieved in 24<sup>th</sup> March 2006. By December 2009, more than 11 million patients have been initiated on treatment – largest cohort in the world. In 2007, the global target of case detection rate (CDR) of 70% had been achieved while maintaining the treatment success rate of more than 85%.<sup>[2]</sup> RNTCP has been revised to provide “universal access to quality TB care to all patients” by 2015, which was marked by the launch of a new DOTS logo from 24<sup>th</sup> March of World TB day 2011. These encouraging trends were showing that RNTCP was on the right path towards achieving by 2015 the Millennium Development Goal related to TB. The 2nd phase of TB started in 2005, and all components of new Stop TB Strategy were incorporated in the 2nd phase.<sup>[2]</sup> However, lack of public awareness along with limited involvement of communities and non-governmental organizations (NGOs) had been identified

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as challenges impeding progress toward TB control. It is seen that the patients of TB hide their disease from family, relatives, and community due to stigma, which is again due to lack of knowledge, and India lags far behind the developed countries in managing TB due to this social stigma and lack of proper knowledge. The World Health Organization (WHO) has identified the need for innovative approaches and recommended an Advocacy, Communication and Social Mobilization (ACSM) framework for national TB Programs.<sup>[3]</sup> ACSM activities have seen as an important and necessary step to elicit greater awareness and engagement in TB control in order to achieve global TB targets.<sup>[4]</sup> Therefore, to achieve the goal of RNTCP, community participation, by way of creating awareness about the etiology, symptoms, mode of spread, source of information etc. is necessary to remove fear and stigma. A very few studies in India have highlighted the awareness and knowledge regarding TB among general population. With this background, we conducted a study with the objective to identify the knowledge, awareness, and perception regarding social variables of tuberculosis and to associate the awareness with their literacy status.

## MATERIALS AND METHODS

Type of study was observational, descriptive, epidemiological study. Study design was cross-sectional in nature. Study setting was general out-patient department of tertiary care hospitals of West Bengal. Study period was April 2011. Study population was patients attending general OPD of the hospitals. Study tool was a pre-designed pre-tested schedule, containing both open-ended and close-ended questions. Study variables were age, sex, religion, residence, education, occupation, type of family, per capita monthly income, different aspects of TB knowledge i.e. heard of TB disease, cause and mode of transmission, symptoms, prevention, curability, and place of treatment. Study technique was by exit interview. Sample size was 464 (four hundred sixty four) patients. Sampling technique was systematic random sampling (every 10th patient), with a random start of all attending general and medical OPD patients in all days of the month. Before actual study, a pro-forma was designed in consultation with 3 experts on the subject of data collection, and pre-testing of the same was done to assure its validity. Necessary correction and modification was adopted in the pro-forma for smooth operation in data collection. Patients were informed about the purpose of the study, and their informed verbal consent was taken. They were assured about their confidentiality and anonymity. Then, data were collected from patients in that month by an exit interview method. Finally, the collected data tabulated, analyzed, and interpreted by proper statistical methods (by percentage and Z test).

## RESULTS

A total of 464 patients of tertiary care hospitals of Bengal were interviewed, and their socio-demographic profile was

revealed [Table 1]. Their age ranged from 20 to 65 years, out of which 60.34% were males and rest 39.66% were females. It was seen that majority of the respondents were in the age group of 36 to 45 years (41.38%), and minimum number (12.07%) were in the age of less than 25 years, which means adults were over-represented. Almost half of them were Hindus (50.86%), and half were Muslims (49.14%). Majority (65.52%) were from nuclear families. 56.89% belonged to rural areas. More than one third study population was illiterate (37.93%). Almost all females were home-makers (95.00%), and majority of males were in service (65.00%), followed by business (29.00%). The mean per capita monthly income was Rs. 565.

The findings related to tuberculosis [Tables 2 and 3] revealed that most of all (91.38%) had heard about TB. When they were asked about the cause of TB, the only correct answer, "infection," was told by only 16.81% of respondents. Smoking was told by 17.24%, poor diet by 06.03%, and mal-nutrition by 42.24%. Other answers were weakness (09.48%) and bad water (04.31%). One-fifth (20.69%) of respondents were unable to specify any cause. About 72.41% had heard about TB from an informal contact i.e. either from their family (51.72%), friends (16.38%), or from neighbors (4.31%), 14.66% had their knowledge from mass media i.e. from radio, television, or from posters and only 12.93% from any health professionals. Regarding the mode of spread of TB, the correct response was (cough, spit, or sputum-droplet, air-borne) told by 31.47% of patients. Eating with TB carrier (08.62%), talking face-to-face (05.17%), and unhygienic conditions (05.17%) were also reported. 49.57% of patients didn't have any idea about mode of spread of TB. 62.07% of them correctly answered that cough was the commonest symptom, followed by hemoptysis (30.17%), fever (25.00%), chest pain (05.17%), weight loss, and breathlessness. 'Not known' was told by 34.48% of participants. There were multiple responses in respect of symptoms. 82.76% knew about curability of the disease. When they were enquired that if they had TB, how they would keep from giving it to others, acceptable answer like modern treatment was told by 87.07% of respondents, followed by covering mouth during coughing (18.10%) and proper disposal of sputum (12.93%). Isolation of patient (08.62%) and avoidance of sharing of food (06.03%) were reported as preventive measures. Many respondents told more than one precaution. However, regarding place of treatment, 72.41% patients told about hospitals and health centers, and only 01.72% knew about DOTS clinic. Many of them perceived about preventable nature of the disease, but there was a tendency to discrimination and stigmatization regarding how to prevent it i.e. by isolation, avoid sharing food etc. The literacy status [Table 4] had a significant influence on awareness about TB. It was evident that literates were significantly more aware than illiterates regarding communicability, cause, mode of transmission, symptoms curability of TB, and place of treatment.

**Table 1: Socio-demographic profile of the study population (n = 464)**

Characters	Specified characters	Number	Percentage
Age (years)	<25	56	12.07
	25-35	136	29.31
	36-45	192	41.38
	>46	80	17.24
Sex	Male	280	60.34
	Female	184	39.66
Religion	Hindu	236	50.86
	Muslim	228	49.14
Residence	Urban	200	43.11
	Rural	264	56.89
Education	Illiterate	176	37.93
	Primary	48	10.35
	Middle school	128	27.58
	Secondary	48	10.35
Type of family	Higher secondary and above	64	13.79
	Nuclear	304	65.52
Per capita monthly income (Rs)	Joint	160	34.48
	<1001	264	56.89
	1001-3000	152	32.77
	3001-5000	28	06.03
	≥5001	20	04.31

## DISCUSSION

India is the highest tuberculosis burden country in the world.<sup>[1]</sup> Knowledge and awareness regarding various aspects of tuberculosis among masses is very important to address this problem. RNTCP is characterized by free of cost TB diagnosis and treatment. However, the mass survey carried out by the Central TB Division, Ministry of Health, Government of India, reported poor level of awareness among general population. Government of India has initiated an ACSM (Advocacy, Communication and Social Mobilization)) program on TB to empower patients and to make people understand when and where they should seek health care through improved knowledge, changed attitudes, and participation. This massive education program through mass media i.e. TV, radio etc. in India has been proved to make a great impact on the enhancement of public knowledge about TB, which was reflected in our study where almost all people have heard about TB. Some other studies also showed similar results.<sup>[5-8]</sup> In a study in China by Wang *et al.*,<sup>[5]</sup> 99.20% of general population had heard about TB. The corresponding figures were 86.80% in Ethiopia by Mesfin *et al.*,<sup>[6]</sup> 99.10% in Delhi by Sharma *et al.*,<sup>[7]</sup> and 93.20% in Bihar by Devey.<sup>[8]</sup> However, in a study in Tamil Nadu by Kar *et al.*, only 56% of respondents had heard about TB<sup>[9]</sup> and another study in Punjab by Singh *et al.* revealed that this rate was 75.5%.<sup>[10]</sup> In this study, a minor proportion of patients told about germ or infection as the cause of TB, which indicates an incomplete perception of TB among general population in spite of such massive education program that arouse our consideration on the ACSM whether it was a successful campaign. Wang<sup>[5]</sup> in China (16.00%), Devey<sup>[8]</sup> in Bihar (14.00%), and Singh<sup>[11]</sup> in slum of Delhi (23.00%) showed

**Table 2: Distribution of study population according to knowledge about tuberculosis (n = 464)**

Characters	Specified characters	Number	Percentage
Heard of TB disease	Yes	424	91.38
	No	40	08.62
Cause of TB (multiple responses)	Smoking	80	17.24
	Mal-nutrition	196	42.24
	Infection	78	16.81
	Poor food	28	06.03
Mode of spread	Water	20	04.31
	Weakness	44	09.48
	Not known	96	20.69
	Coughing/Spit/Sputum	146	31.47
	Eating with TB carrier	40	08.62
Source of knowledge	Talking face to face	24	05.17
	Unhygienic conditions	24	05.17
	Don't know	230	49.57
	Family (informal)	240	51.72
	Friends (informal)	76	16.38
Symptoms*	Neighbors (informal)	20	04.31
	Health personnel	60	12.93
	Mass media	68	14.66
	Cough	288	62.07
	Fever	116	25.00
	Hemoptysis	140	30.17
	Chest pain	24	5.17
Others (weight loss, breathlessness)	72	15.52	
	Not known	160	34.48

\*Multiple response

more or less similar results. A study at Rajasthan by Yadav *et al.*<sup>[12]</sup> showed that only 1.60% and at Ethiopia by Mesfin *et al.*,<sup>[6]</sup> only 09.60% had actual perception about cause of TB, whereas some other studies showed much higher results.<sup>[7,10,12-17]</sup> A study conducted at rural Delhi in 2006 showed very encouraging result where more than 95% participants were aware of cause of TB.<sup>[18]</sup> In our study, and in some other studies<sup>[10,15-17,19]</sup> also, there was some wrong beliefs about cause of TB e.g. poor diet, malnutrition, smoking, alcohol, heredity, curse, pollution etc., which may affect the timely response of potential TB patients in the health facility. Regarding the modes of transmission, the only correct answer droplet or air-borne was told by a sizable amount of respondents i.e. less than half of participants, and this was similar to few previous studies.<sup>[14,20,21]</sup> Higher figures for the same were reported by some other studies<sup>[7,12,13,15-17]</sup> and in contrast, lower figures by some other studies.<sup>[8,9]</sup> There were some wrong perceptions about modes of transmission e.g. eating together, sharing food and utensils, talking face-to-face etc. in our study and in some previous other studies,<sup>[7,8,11,14-16]</sup> and this indicates that there was a wide knowledge gap regarding TB among the public after 14 years of DOTS implementation. In the present study, majority of the participants perceived cough with sputum as the commonest symptom of TB, followed by fever and hemoptysis. There were multiple responses by participants. Split, Croatia<sup>[15]</sup> study reported that 92.2% participants were able to identify cough and/hemoptysis as principal symptoms. Delhi study by Malhotra *et al.*<sup>[13]</sup> reported 73.7, 34.30,

and 30.00%, Nepalese study by Bhatt *et al.*<sup>[21]</sup> reported 82.00, 72.00, and 72.00%, Rajasthan study by Yadav *et al.*<sup>[12]</sup> reported 45.20, 28.90, and 44.00%, Aligarh study by Khalil *et al.*<sup>[16]</sup> reported 75.0, 47.8, and 31.85%, Safdarjang hospital study by Matta *et al.*<sup>[22]</sup> reported 59.3, 50.6, and 11.3%, South Indian study by Subramanian *et al.* reported 66, 13, and 15% percent,<sup>[23]</sup> Punjab study by Singh *et al.* reported 40, 65, and 42%,<sup>[10]</sup> cough, fever and hemoptysis respectively. Study in China<sup>[5]</sup> revealed that only 16.00% of study population knew cough as the commonest symptom, while a worldwide internet survey<sup>[14]</sup> showed it was 49.50% and another study in Delhi<sup>[7]</sup> showed it was as high as 90.10%, and in another study in Vellore,<sup>[17]</sup> it was 80.4%. This greater awareness about symptoms was encouraging and may improve passive case finding. Following the Orissa ACSM study, a number of ASHAs and AWWs reported that they were now aware of signs and symptoms and new referral guidelines of TB.<sup>[24]</sup> We were very glad to find out that majority of our study population knew that TB was

curable like some previous studies.<sup>[5-7,12,13,15,16,19,20]</sup> In a study at Serbia,<sup>[20]</sup> it was 86.60%, in Ethiopia,<sup>[6]</sup> 69.40%, in China,<sup>[5]</sup> 73.00%, in Split, Croatia,<sup>[15]</sup> 94.80%, and in Rajasthan,<sup>[12]</sup> 90.00%. 94.40% reported by Malhotra<sup>[13]</sup> and 97.00% reported by Sharma<sup>[7]</sup> believed that TB was curable. The most important criteria to assess sufficient knowledge of TB were determined by the answers of 3 questions – cause of TB, mode of spread of TB, and how TB patients would keep from giving it to others as they were all directly related to the preventive aspects, which were vital from an epidemiological standpoint. In Orissa study, patients interviewed in a number of clinics were aware of the symptoms of the disease and understood its transmission, duration of treatment, sputum follow-up schedule, and were confident that DOTS provided an effective cure. A number of patients also reported that they referred other symptomatic persons for sputum examination, demonstrating good social mobilization.<sup>[24]</sup>

**Table 3: Awareness of clients regarding prevention and treatment of tuberculosis (n = 464)**

Characters	Specific characters	Number	Percentage
Curability of TB	Yes	384	82.76
	No	64	13.79
	Don't know	16	3.45
	Modern treatment	404	87.07
How TB patients are kept non-infectious to others (Multiple response)	Covering mouth during coughing	84	18.10
	Proper disposal of sputum	60	12.93
	Isolation of patient	40	08.62
	Avoid sharing of food	28	06.03
	Others (separate utensils, not to smoke, nutritious diet)	20	04.31
	Hospital and health centers	336	72.42
	Place of treatment	DOTS Centre	08
	Others (ayurvedic, homeopathy)	08	01.72
	Don't know	112	24.14

Regarding prevention of TB, 87.07% respondents of our study told modern treatment followed by covering of mouth while coughing and proper disposal of sputum were other responses. Many respondents stated more than one precaution. A study among general population of Delhi by Sharma *et al.*<sup>[7]</sup> showed somewhat higher results where 95.50% respondents told about treatment and 30.00% about cough hygiene. Savicevic in Split, Croatia<sup>[15]</sup> reported early diagnosis and treatment by 90.7% of respondents, followed by hygiene (53.9%) and better nutrition (43.5%). Malhotra<sup>[13]</sup> has reported that treatment, covering mouth while coughing, and proper disposal of sputum were known to 73.70, 46.60, and 38.90% individuals, respectively, while in Bihar study,<sup>[6]</sup> it was very lower where only 33.00% were aware about modern treatment. It was very alarming that even today there was tendency to discriminate TB patients, which was quite evident from preventive aspects of our study and from other studies also. A good number of patients told about isolation of patients, avoidance of sharing of food, and few told others i.e. separate utensils, not to smoke, nutritious diet as preventive measures. This tendency was seen in some previous studies.<sup>[6-8,11-13,16]</sup> Therefore, on one hand, it was very encouraging as we expect individuals to seek health

**Table 4: Awareness level about tuberculosis according to literacy status (n = 464)**

Awareness	Literate (n = 288)	Illiterate (n = 176)	Total (n = 464)	Z, P value
Is it communicable disease	248 (86.11)	80 (45.45)	328 (70.69)	Z = 9.35, P < 0.05
Is it caused by germ	60 (20.83)	20 (11.36)	80 (17.24)	Z = 2.65, P < 0.05
Is it spread by droplet	140 (48.61)	52 (29.50)	192 (41.38)	Z = 4.09, P < 0.05
Is it curable	264 (91.66)	120 (68.18)	384 (82.76)	Z = 6.60, P < 0.05
Symptoms (Multiple response)				
Cough	188 (65.28)	100 (56.81)	288 (62.06)	Z = 1.95, P < 0.05
Fever	80 (27.78)	36 (20.45)	116 (25.20)	Z = 1.80, P < 0.05
Hemoptysis	100 (34.72)	40 (22.72)	140 (30.17)	Z = 2.76, P < 0.05
Chest pain	16 (05.56)	08 (04.54)	24 (5.17)	Z = 0.44, P > 0.05 (low sample)
Place of treatment				
Hospitals and health centers	236 (81.94)	100 (56.81)	336 (72.42)	Z = 3.22, P < 0.05
DOTS clinic	08 (2.77)	00 (00.00)	08 (01.72)	Low sample

care as early as possible. On the other hand, it reflects the fear, apprehension, and stigma towards the disease. Efforts should be made to allay this fear. Orissa ACSM study showed that in communities where TB patients had been integrated into community groups, stigmatizing attitudes were reduced and a number of suspects had been referred for treatment directly by the cured patient.<sup>[24]</sup> IFNGOs should take a lead in the formation of district level patient's associations, which would work to build TB awareness and to reduce stigmatizing attitudes.<sup>[24]</sup> Regarding place of treatment, majority of participants of our study believed that the care is given by hospitals and other health care facilities, whereas only very meager (1.72%) of our study population was aware about DOTS center, which indicates the need of massive ACSM activities among general public so that they can go to the nearest right place for treatment. In Orissa ACSM study, general populations also services, and their nearest health facilities demonstrated confidence about the location of TB.<sup>[24]</sup> Malhotra,<sup>[13]</sup> Kar,<sup>[9]</sup> Ganapathy<sup>[19]</sup> also reported that major population was in favor of government facility for treatment of TB, and in sharp contrast, Sharma<sup>[7]</sup> reported that major participants preferred DOTS center and hospitals. Orissa study also showed that demand for DOTS has been increased by the public as a result of improved mobilization of health workers.<sup>[24]</sup> Source of information about TB can be utilized to improve the existing level of knowledge and to bring about a positive change in the practice of people regarding TB. Almost three-fourth of respondents of our study had their knowledge about TB from interpersonal contact i.e. from family, friends, and neighbors. This finding was quite similar in a study at Ethiopia,<sup>[6]</sup> at Bihar,<sup>[8]</sup> at Rajasthan,<sup>[12]</sup> and at slum of Delhi.<sup>[11]</sup> Minority of our study population got their awareness from mass media, which again tells the same story that the influence of mass media was not substantial in disseminating information like other studies.<sup>[6,9,12]</sup> But, Delhi study by Malhotra<sup>[13]</sup> as well as Nepalese study<sup>[21]</sup> revealed an opposite picture. However, in a very recent study in Orissa about ACSM, TB knowledge, attitude, and behavior were interviewed among general population where traditional healers were seen by a number of community respondents as more trusted source of information.<sup>[24]</sup> In the present study, only few had their information from doctors and other health care personnel, similar to Bihar study<sup>[8]</sup> and Tamil Nadu study<sup>[9]</sup> but not similar with the study of Delhi<sup>[13]</sup> and Ethiopia.<sup>[6]</sup> This may be assumed that literates were better informed and were more aware about various aspects of TB as compared to illiterates, which was revealed clearly from our study. Different other studies also showed similar results.<sup>[7-9,11,12,15,16]</sup> An attempt could be made in future to improve an awareness among illiterates to remove myths and misconceptions, to allay the social stigma attached with it to decrease TB transmission, indirectly to prevent drug resistance improving the efficacy of DOTS, by greater emphasis on the methods, which don't require a person to read. The involvement of AYUSH medical practitioners to counsel suspects about TB and advocate DOTS at the community level should also be observed during

evaluation in ACSM program as done in Orissa State.<sup>[24]</sup>

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#### Announcement



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