Awareness and perception regarding tuberculosis among patients and their relatives attending a tertiary care hospital in Uttarakhand: A hospital-based exploratory survey

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ABSTRACT

Background: Awareness about disease among tuberculosis (TB) patients plays a crucial role toward successfully achieving targets for control, prevention, and their relatives treatment adherence and is not well studied or documented. This study sought to explore the awareness and perceptions of TB patients in a tertiary care centre in northern India. Methods: This was an exploratory study conducted between January and December 2016 among 1,000 pulmonary TB patients and their relatives. Structured and validated interview schedule was used to assess participants knowledge and perception regarding TB, which comprised of 41 questions. Ethical clearance was taken and written informed consent was obtained from each study participants. Data analysis was done using SPSS 22.0 version. Results: A total of 1,000 study participants (mean age 40.2 ± 9.6 years, females 51%) were enrolled. More than two-third of the study participants were from Uttarakhand. Study participants had highest knowledge score (61.85%) regarding sign and symptoms, followed by scores in the aspect of prevention and treatment of TB (52.7%). However, a lower proportion (51.5%) knew about its causation. Overall knowledge score was 54.8%. Around half of the subjects (49.7%) disagreed that TB is a major health problem. Conclusions: Regardless of non-satisfactory knowledge of participants, their perception regarding TB was better. As to the associated factors, we found that participants’ knowledge had significant association with religion, educational status, occupation, family income per month, type of family, and source of health information. Although there was insignificant difference between family monthly incomes, source of health information and perception regarding TB.

Keywords: Awareness and perception of tuberculosis, knowledge, tuberculosis

Introduction

Despite the availability of treatment, tuberculosis (TB) is still considered to be a stigma and people are either afraid of it or unaware about it. Global Health Strategies (GHS) has worked closely with the Central TB Division to raise public discourse and build awareness on TB in India through audience-specific materials and communications strategies.[⁶]

India contributes one-fifth of the global incidence of TB with 2 million new TB cases each year. It is estimated that about 40% of the Indian population is infected with mycobacterium TB bacteria, majority of whom have latent rather than active...
TB disease. Uttarakhand facing a problem of a large number of people afflicted with TB, both in the hills and plains. A quarterly (Jan–April, 2014) report of the Revised National TB Programme Control (RNTCP) Uttarakhand has listed that the state has 3,389 TB patients, of which over 1,300 were cases of fresh infections.[9]

According to the Annual Health Survey 2011–2012, Uttarakhand, the census reported 235 and 242 cases per lakh population in rural and urban areas, respectively.[10] The other problem which is faced by the state is the patients who were on treatment under the DOTS (Directly Observed Treatment, Short Course), they discontinue taking drugs midway and thus multiple drug-resistant TB (MDRT) is a new threat in the state. WHO recently changed guidelines regarding TB, and has encouraged people who suffer from loss of appetite for a period of 2 weeks to visit the nearest health centre and get tested for TB.[11]

**National scenario**

A cross-sectional study conducted in a tertiary care hospital in patients >18 years of age attending general outpatient department, among 420 patients. Study results reported that about 86.19% knew that India had high TB burden, 72.86% were aware of the infective etiology. 51.19% thought it affected all ages with a male preponderance (63.09%). 80.48% considered cough as the most common symptom. Only 48.10% knew about DOTS centres, 40.95% of the free treatment available, 53.10% of the curability of the disease, and 55.48% about the fact that TB can lead to death. Study concluded though the awareness of symptoms, causative agent, mode of spread were reasonably good, but knowledge on availability of DOTS centres, free treatment, curability and TB possibility leading to death is still poor among rural population.[11] Another cross-sectional study to know the sociodemographic profile of patients with TB and to assess knowledge and awareness regarding TB among patients with TB was conducted. Purposive sampling technique was used and total 151 patients registered. Information was collected regarding their health status, DOTS (directly observed treatment short course) therapy, and their awareness regarding TB. Study finding suggest that poor knowledge about cause, symptoms, and transmission of the disease was observed in females and in illiterate patients. More than 50% patients with TB were aware of person-to-person transmission of TB. About 62 (41.05%) patients of TB knew mode of spread of TB and 95 (62.91%) correctly answered that cough was the most common symptom. About 91 (60.26%) patients said that TB can be prevented by BCG vaccine, 99 (65.56%) knew about DOTS clinic, 40 (26.9%) knew about TB from doctor, and only 90 (59.6%) believed that TB was curable.[11] In an urban slum in south India, level of awareness about TB in terms of knowledge about TB, symptoms, spread, diagnosis, treatment, and prevention of TB was assessed. Study finding showed that there were 94% respondents who had heard about TB. Majority of the respondents (82%) were aware that cough is a symptom of TB. Approximately 79% of study subjects reported awareness regarding diagnostic test of TB and out of that only 40% reported sputum examination as a method of diagnosis for TB. Study concluded that level of awareness about TB among urban poor in a slum area is good. Knowledge about “free treatment” and “duration of treatment” has to be stressed during health education activities.[10] In a population based cross-sectional study was carried out to assess the awareness, attitude, and treatment seeking behavior regarding TB in rural Tamil Nadu. Out of 1,985 people interviewed, 56% had heard of TB, however 80% weren’t aware regarding the cause and mode of spread of TB. 45% participants gained majority of information regarding TB through television. Only few participants (34%) were aware that treatment for TB was available free of cost. More than 80% people preferred to visit Government Hospital, if developed TB, whereas 54% actually sought treatment from Government Hospital for cough more than 3 weeks.[7] In a study conducted in a tertiary care centre from Delhi, the knowledge and attitude toward TB was assessed among 208 adults. Only 12.6% were aware regarding duration of TB treatment and very few, that is, 1.7% knew about preventive role of BCG. Tendency to discriminate TB patients was evident from the findings as 71% respondents were in favor of isolating TB patients from the family, 74.1% on avoiding the patient in food sharing, on quitting job by the patient (33%), prohibiting wedding of the patient (27.6%), turning away from attending social functions (18%). Extensive health education leading toward attitudinal amendment by community involvement is required to form awareness and take away myths concerning TB in such areas.[13]

Other challenges associated with TB control are low case detection, little community involvement, a lack of empowerment of people affected by the disease, and low political commitment and resources for TB control.[13] There is a range of social and cultural barriers to access TB care. These social and cultural barriers are addressed by information dissemination and behavior change communication initiatives. Efforts are still needed to improve the health seeking behavior especially in the cases of poor or uneducated. Disease is curable, and if treated in time can be cured easily. The mindset has to be changed, toward prevention and treatment of TB; therefore, the investigators were keen to identify the awareness and perception regarding TB and to help authorities to initiate action appropriate.

**Methodology**

An exploratory survey was conducted to assess the knowledge and perception regarding TB among 1,000 patients and their relatives visiting outpatient department of AIIMS, Rishikesh. All the patients and their companions above the age of 18 years and those who were willing to participate was selected through convenience sampling technique to participate in the study. Patients who were critically ill, psychologically unstable, practicing health professionals and those who couldn't understand Hindi or English were excluded from the study. Structured interview schedule was used to assess patients’ knowledge and perception regarding TB. The survey contained 41 questions pertaining...
to three different areas: demographics, TB knowledge, and perception. The tool was found to be valid and reliable (r = 0.84). Permission for conducting study was obtained from the concerned institutional authorities and ethical consideration was kept in mind. Consent was obtained from the study participants. Data analysis was done using descriptive and inferential statistics based on study objectives with the help of SPSS 22.0 version (IBM Corp., Armonk, NY, USA).

### Results

Table 1 explains about the sociodemographic characteristics of 1,000 study participants. Mean age was 40.2 ± 9.6 years with 514 (51.4%) females and nearly 486 (48.6%) males. Maximum numbers of respondents were belonging to Hindu religion 689 (68.9%). More than one-third of the respondents (313, 31.3%) had completed higher secondary, 249 (24.9%) had completed primary school, and only 192 (19.2%) had no formal education. As for occupation, 370 (37%) of the samples were unemployed or housewife, and only 164 (16.4%) were in Government service. There were 473 (47.3%) respondents who earn Rs. >6,000/month and 163 (16.3%) participants earn Rs. ≤2,000/month. Majority of the participants 675 (67.5%) were residents of Uttarakhand, and 2 (0.2%) study subjects were from Nepal. A little over half of the respondents (544, 54.4%) were from nuclear family. On asking about the source of health information, 384 (38.4%) and 326 (32.6%) responded that they got the health information through media and health personnel, respectively. Out of total 1,000 studied participants, 761 (76.1%) had no history of smoking. 189 (18.9%) patients reported that they had history of TB among self, family, and relatives and out of 189 patients with history of TB among self, family, and relatives, 111 (11.1%) of patients’ family had TB in the past, 45 (4.5%) patients’ relatives suffered from TB and only 33 (3.3%) patients themselves suffered from TB in the past.

Study participants had highest knowledge score (61.8%) regarding sign and symptoms of TB with four items. This was followed by score in the aspect of prevention and treatment of TB (52.7%) with seven items, however a lower proportion (51.5%) knew about TB and its causation with four items. However, overall knowledge score of the participants was 54.8% with total 15 items.

Perception was assessed using 15 agree–disagree statements regarding patients’ subjective belief about TB. Around half of the subjects (49.7%) disagreed that TB is a major health problem and only 0.6% strongly agreed to the fact, while 48.6% of participants disagreed and 14.2% were strongly disagreed poverty as one major factor responsible for TB. Very few (6.4%) patients responded that TB affects mostly in male and on the contrary 30.7% disagreed to the same. Nearly half of the participants (47.2%) disagreed that TB can affect all the age group and around 29.4% agreed that treatment of TB is very long. Almost half of the participants disagreed to the statement that treatment for TB is curable. Almost one-third of the study population (32.4%) agreed that treatment of TB can be discontinued when symptoms resolve, although 24.8% had neutral response to the same statement. About 46.5% participants disagreed that TB can lead to death, followed by 44.3% with the statement that smoking can cause TB and 31.4% with the fact that patients with HIV/AIDS are more prone to get TB. Nearly 30.8% agreed and 40.7% shared neutral response when asked that whether bland diet is recommended during the

### Table 1: Sociodemographic characteristics of the respondents (N=1,000)

| Variables                              | Frequency | Percentage (%) |
|----------------------------------------|-----------|----------------|
| Gender                                 |           |                |
| Male                                   | 486       | 48.6           |
| Female                                 | 514       | 51.4           |
| Religion                               |           |                |
| Hindu                                  | 689       | 68.9           |
| Muslim                                 | 189       | 18.9           |
| Christian                              | 60        | 6.0            |
| Sikh                                   | 62        | 6.2            |
| Educational Status                     |           |                |
| No Formal Education                    | 192       | 19.2           |
| Primary                                | 249       | 24.9           |
| Higher Secondary                       | 313       | 31.3           |
| Graduation and above                   | 246       | 24.6           |
| Occupation                             |           |                |
| Government Service                     | 164       | 16.4           |
| Self-Employed                          | 276       | 27.6           |
| Agriculture/Domestic Worker           | 190       | 19.0           |
| Unemployed/House Wife                  | 370       | 37.0           |
| Family Income Per Month (Rs.)          |           |                |
| ≤2,000                                 | 163       | 16.3           |
| 2,001-6,000                            | 138       | 13.8           |
| 4,001-6,000                            | 226       | 22.6           |
| >6,000                                 | 473       | 47.3           |
| Type of Family                         |           |                |
| Joint                                  | 392       | 39.2           |
| Nuclear                                | 544       | 54.4           |
| Extended                               | 64        | 6.4            |
| Source of Health Information           |           |                |
| Media                                  | 384       | 38.4           |
| Health Personnel*                      | 326       | 32.6           |
| Friends and Neighbors                  | 192       | 19.2           |
| Relatives                              | 97        | 9.7            |
| Habit of Smoking                       |           |                |
| Yes                                    | 239       | 23.9           |
| No                                     | 761       | 76.1           |
| Place of Residence                     |           |                |
| Uttarakhand                            | 675       | 67.5           |
| UP                                     | 285       | 28.5           |
| Others                                 | 37        | 3.7            |
| Nepal                                  | 02        | 0.2            |
| H/O TB among self/family/relatives     |           |                |
| Yes                                    | 189       | 18.9           |
| No                                     | 811       | 81.1           |
| Who had TB in Family (n=189)           |           |                |
| Self                                   | 33        | 3.3            |
| Family                                 | 111       | 11.1           |
| Relatives                              | 45        | 4.5            |

TB—Tuberculosis, * Doctor/Nurse/Social Health Worker

Disclaimer: This text is a sample and does not reflect the actual content of the provided image.
treatment of TB. Almost one-third of the participants (31.6%) disagreed that skipping of dose during the treatment of TB can produce drug resistance followed by 43.3% who agreed to the statement that person with TB should be separated from the family members. Out of total, 43.3% participants agreed to the statement that person with TB should be separated from the family members; however, 20.8% disagreed to the same. About 40.5% of the participants agreed that the person suffering from TB must take complete bed rest followed by 15.0% who disagreed with the statement [Table 2].

Total score for knowledge and perception ranged from 0 to 15 and 15 to 75, respectively. The mean knowledge score of study population regarding TB was 8.3 ± 3.6. The mean perception score of participants regarding tuberculosis was 50.6 ± 4.4. The maximum mean percentage of participants knowledge score was 55.2%, whereas maximum mean percentage of participants perception was 67.4%. Thus, higher score on perception indicate better subjective belief than understanding regarding TB.

Mean score of knowledge and perception related to TB among respondents according to gender and history of TB were analyzed. It was found that female participants had significantly better perception about TB and respondents with history of TB had better knowledge regarding TB (P < 0.001) [Table 3].

There is extremely strong evidence that demographic variables like religion, educational status, occupation, family income per month, type of family and source of health information had statistically significant association with knowledge scores of study participants regarding TB (P < 0.001) [Table 4].

It was found that there was a statistically significant association between demographic variables (religion, educational status, occupation, and type of family) and perception of respondents regarding TB. However, no association was found between participants’ few demographic variables (family income per month, source of health information) and perception of study participants regarding TB [Table 5].

**Discussion**

The demographic profile of the study subjects who participated in this study like female gender and families living with family monthly income >6,000 are consistent with data from other investigation that are present in scientific literature. Several studies explained that the majority of respondents heard about TB from health workers and media; this study also reported similar findings, that is, 384 (38.4%) and 326 (32.6%) responded that they got the health information through media and health personnel, respectively [Table 1]. On the contrary, Esmael A et al. reported in their study that participants received very little information from the television or media.

In the present study, participants were deficient of knowledge regarding TB, its causes, sign and symptoms, treatment and preventive management. It was found that the mean percentage of patients’ knowledge score was 55.2%. No significant association was observed between gender and knowledge regarding TB. These findings are similar to those of Rathore MS et al., who reported insignificant difference in knowledge regarding TB between males and females. Mean percentage of patients’ perception was 67.45%, which shows higher score on perception indicate better subjective belief than understanding regarding TB. On the other hand, study done by Melaku S et al. concluded that participants had high proportion of negative perception regarding TB.

| Perception Regarding Tuberculosis                                                                 | Strongly agree | Agree | Neutral | Disagree | Strongly Disagree |
|-------------------------------------------------------------------------------------------------|---------------|-------|---------|----------|------------------|
|                                                                                                 | n             |       | n       | n        | n                |
| Tuberculosis is a major health problem.                                                          | 66            | 0.6   | 47      | 4.7      | 55               | 5.5              | 497               | 49.7             | 395               | 39.5             |
| Poverty is one of the major factors responsible for TB                                           | 31            | 3.1   | 131     | 13.1     | 210              | 21.0             | 486               | 48.6             | 142               | 14.2             |
| TB affects mostly males                                                                          | 64            | 6.4   | 235     | 23.5     | 269              | 26.9             | 307               | 30.7             | 125               | 12.5             |
| TB can affect all age groups                                                                     | 15            | 1.5   | 80      | 8.0      | 207              | 20.7             | 472               | 47.2             | 226               | 22.6             |
| Treatment of TB is very long                                                                      | 140           | 14.0  | 294     | 29.4     | 237              | 23.7             | 283               | 28.3             | 46                | 4.6              |
| Duration of treatment of TB is very long                                                          | 27            | 2.7   | 69      | 6.9      | 195              | 19.5             | 461               | 46.1             | 248               | 24.8             |
| TB is curable                                                                                    | 17            | 1.7   | 63      | 6.3      | 150              | 15.0             | 481               | 48.1             | 289               | 28.9             |
| Treatment of TB can be discontinued when symptoms resolve                                         | 99            | 9.9   | 324     | 32.4     | 248              | 24.8             | 230               | 23.0             | 99                | 9.9              |
| TB can lead to death                                                                              | 48            | 4.8   | 104     | 10.4     | 193              | 19.3             | 465               | 46.5             | 190               | 19.0             |
| Smoking can cause TB                                                                             | 17            | 1.7   | 69      | 6.9      | 155              | 15.5             | 443               | 44.3             | 316               | 31.6             |
| Patients with HIV/AIDS are more prone to get TB                                                  | 21            | 2.1   | 123     | 12.3     | 354              | 35.4             | 314               | 31.4             | 188               | 18.8             |
| Bland diet is recommended during the treatment of TB                                              | 122           | 12.2  | 308     | 30.8     | 407              | 40.7             | 131               | 13.1             | 32                | 3.2              |
| Skipping of a dose during the treatment of TB can produce drug resistance                         | 25            | 2.5   | 109     | 10.9     | 397              | 39.7             | 316               | 31.6             | 153               | 15.3             |
| TB patients should be separated from family members                                               | 145           | 14.5  | 433     | 43.3     | 189              | 18.9             | 208               | 20.8             | 25                | 2.5              |
| TB patient must take complete bed rest                                                            | 176           | 17.6  | 405     | 40.5     | 214              | 21.4             | 150               | 15.0             | 55                | 5.5              |
The current study revealed that, out of all sociodemographic variables tested, religion, educational status, occupation, family income per month, type of family and source of health information had significance association and became predictive of overall high knowledge regarding TB. Results from ANOVA are described in Table 4. The study results are similar to a study concluded that occupation, family size, and household income/month had significant association with knowledge.[13]

Some studies revealed that perception of TB was not associated with any of the socioeconomic factors tested.[15,16] Present study also revealed the same as there was no significant association found between family monthly income, source of health information and participant’s perception. On the contrary it was found that religion, educational status, occupation and type of family had an influence over participants’ perception [Table 5].

Primary healthcare physicians or family physicians play an important role in TB control through early detection of the disease, referral for treatment, and involvement in directly observed treatment. This article will help primary care physicians to better understand the poor knowledge about disease among patients and their attendants and need to spend more time with TB patients for better counselling and improving treatment compliance.

**Conclusion**

The assessment of knowledge and perception regarding TB provides valuable information, it is concluded that participants’ knowledge regarding TB was not satisfactory. Regardless of the level of knowledge by the participants, their perception regarding TB was better. As to the associated factors, we found that participants’ knowledge had significant association with religion, educational status, occupation, family income per month, type of family, and source of health information, although there was insignificant difference between family monthly income, source of health information and perception regarding TB.

**Recommendations**

The findings of the study can be used to plan for in-depth health education programme for spreading more awareness regarding TB in rural areas. It can help to promote early diagnosis and treatment for Tuberculosis. Health programmes based on these findings can help to reduce stigma associated with TB at community level.
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Conflicts of interest
There are no conflicts of interest.

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