

Awareness about tuberculosis and RNTCP services among rural people in Nalgonda district, Telangana

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ABSTRACT

Background: Tuberculosis (TB), an infectious disease caused by *Mycobacterium tuberculosis* discovered in ancient centuries still remains a major public health problem in India. Lack of awareness about the cause, risk factors, treatment and prevention of TB among rural people is a major challenge to be addressed to reduce disease transmission. **Aims:** To assess the knowledge of TB among rural people. To assess the awareness about RNTCP services. **Settings and Design:** Cross-sectional study was conducted in six randomly selected villages attached to a medical college. **Methods and Materials:** Houses were selected by systematic random sampling method and younger person was identified as study subject. Data were collected from a sample of 300 by predesigned pretested semi-structured questionnaire. **Statistical Analysis Used:** Data were presented in proportions with confidence interval and Chi-square test was applied to find the association between variables by using SPSS ver. 23. **Results:** The study showed that 79.6% knew that the cause of TB is bacteria. Majority of the participants 93.6% (95% CI: 90.3, 96.1) knew that TB primarily affects lungs. Subjects were aware of free diagnostic services (85.3%), free treatment services (89%) available in the govt setup. **Conclusions:** Although the awareness of symptoms, causative agent, mode of spread was reasonably good, knowledge on availability of DOTS centres, services offered through RNTCP is still poor among rural population.

Keywords: Cough, lungs, RNTCP, rural people, tuberculosis

Introduction

Tuberculosis (TB), an infectious disease caused by *Mycobacterium tuberculosis* discovered in ancient centuries still remains a major public health problem in India. In India, TB is mainly a disease of poor. Smoking, older age, overcrowding, comorbidities like diabetes, HIV and other immunosuppressive diseases,

malnutrition, and poverty are the major predisposing risk factors for TB. The incidence of TB in India was ~ 27 lakhs as per global TB report 2019.^[1] In addition to the existing burden of TB, the pandemic of HIV has further aggravated the incidence of TB.

Government of India launched National TB Programme (NTP) in 1962 which was renamed as Revised National TB Control Programme (RNTCP) in 1993. The RNTCP formulated and adopted the directly observed treatment short course (DOTS) strategy as the most systematic and cost-effective approach to control TB in India. The objectives were achievement of at least 85% of cure rate and detect at least 70% of estimated cases. In 2014, WHO has approved end TB strategy with vision of a world with zero death, disease, and suffering due to TB.

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India developed National strategic plan (2017/2025) with an aim to achieve elimination of TB by 2025.^[2] Despite of many comprehensive methods to end TB, there are many lacunae and there is still long way to go.

Lack of awareness about the cause, risk factors, treatment, and prevention of pulmonary TB particularly among people living in rural areas is a major challenge to be addressed to reduce disease transmission. Therefore, much importance must be given in sensitisation of community about tuberculosis and the services offered through the programme in order to end the disease.

The rationale of this study is to explore awareness among rural people regarding TB and services offered, thus identifying gaps in the delivery of programmatic services at primary level of healthcare. This study also emphasises the need to take necessary action in order to promote community participation and utilisation of the services offered to TB patient in the Government setup rather than visiting private setup. With this background, the present study was planned to assess rural people awareness regarding TB and services offered through RNTCP in Telangana state.

Subjects and Methods

Study design, setting, and subjects

The study was a descriptive, community-based cross-sectional study conducted from 1st February 2019 to 1st April 2019 in 6 randomly selected villages out of 11 villages attached to a medical college in Nalgonda district of Telangana state. Study participants were villagers aged 15 years and above of both genders. Ill and moribund patients, any person or family with history of TB in past or present, participants of pilot study and people who were not willing to participate in the study were excluded.

Sample size and sampling technique

Sample size was estimated using formula of $n = 4pq/d^2$ where $P = 22.8\%$ ^[3] (p was taken from findings of previous study), $q = 77.2$, precision (d) as 5. The calculated $n = 281.6$ which is rounded off to 300 and hence final sample size was 300. On the basis of proportionate sampling method, it was decided to collect data of 92 subjects from Cherlapally village, 63 subjects from Marrigudem village, 41 from Arjalabavi village, 42 from Kanchanapally village, 52 from Anaparthi village, and 10 from Dasarigudem village. Houses were selected by systematic random sampling method. After visiting the selected house, irrespective of sex, younger eligible subject among the available was included in the study.

Study tool and data collection

Pre-designed and pretested semi-structured questionnaire was used as a study tool and pilot study was conducted on 50 rural people initially and questionnaire was translated into local language as a part of standardization of the questionnaire. The questionnaire consists of sociodemographic variables,

such as age, gender, education, occupation, and possessing white ration card, which indicates low socio-economic status. It also consists of questions regarding knowledge about TB and RNTCP services. Data were collected by face to face interview method.

Ethical considerations

Permission was obtained from Institutional ethics Committee on 23.01.2019, before data collection. The study participants were briefed about the purpose and nature of the study, and informed consent was obtained.

Statistical analysis

Data were analysed using IBM SPSS Statistics for Windows Version 23.0. Categorical and continuous data were expressed as proportions with confidence interval (95% CI) and mean with standard deviation (SD), respectively. Pearson's Chi-square test was applied as test of significance for assessing association between education status and subject awareness about tuberculosis. $P < 0.05$ was considered as statistically significant.

Results

The mean age of study participants was 40.53 years (SD \pm 14.17). Majority of participants were of age group 35-45 years (25.3%), females (57.7%), completed or studying college level education (47.3%), unemployed (44.7%), and belong to below poverty line (60.3%) [Table 1].

Table 1: Demography data of study subjects (n=300)

Age group	Frequency	Percentage
15-25	53	17.7
25-35	57	19
35-45	76	25.3
45-55	61	20.3
55-65	41	13.7
65-75	12	4
Sex	Frequency	Percentage
Male	127	42.3
Female	173	57.7
Education	Frequency	Percentage
Illiterate	27	9
Schooling	131	43.7
College	142	47.3
Occupation	Frequency	Percentage
Unemployed	134	44.7
Unskilled worker	43	14.3
Semi-skilled	26	8.7
Skilled worker	16	5.3
Clerk, Shopkeeper, Farmer	48	16
Semi professional	28	9.3
Professional	5	1.7
Socioeconomic status	Frequency	Percentage
Above poverty line	119	39.7
Below poverty line	181	60.3

Table 2: Awareness about Tuberculosis and RNTCP services (n=300)

Question	No. of subjects answered correctly (%)	95% CI
What is the cause of TB? (Bacteria/Polluted air/evil eye/Don't know)	239 (79.6)	74.7, 84.1
TB is a hereditary disease (True/False/Don't know)	95 (31.6%)	26.4, 37.3
TB affects all ages (True/False/Don't know)	219 (73%)	67.6, 77.9
TB is one of the leading causes of mortality in India (True/False/Don't know)	38 (12.6)	9.1, 17
TB is one of the leading causes of infertility (T/F/Dk)*	13 (4.3%)	2.3, 7.3
Malnutrition predispose to TB (True/False/Don't know)	188 (62.6%)	56.9, 68.2
Diabetes increase the risk to develop TB disease (True/False/Don't know)	40 (13.3%)	9.7, 17.7
Smoking can increase the risk of developing TB (True/False/Don't know)	205 (68.3)	62.7, 73.6
Does excessive alcohol consumption contribute to risk for getting tuberculosis? (True/False/Don't know)	8 (2.6%)	1.2, 5.2
TB can affect any organ in the body (T/F/Dk)*	7 (2.3)	0.9, 4.7
TB primarily affects which organ (lungs)	281 (93.6)	90.3, 96.1
Specimen used to diagnose TB(sputum/blood/feces/urine)	214 (71.3)	65.9, 76.4
Is TB curable? (Yes/No/Dont know)	187 (62.3)	56.6, 67.8
Duration of treatment (612 months) (n=187)	23 (12.29)	8, 17.9
Is TB preventable? (Yes/No/Don't know)	267 (89%)	84.9, 92.3
Is there any vaccine related to TB	131 (43.6%)	38, 49.5
Name the vaccine (n=131)	17 (12.9)	7.7, 20
Have you heard/seen DOTS centre(Yes)	56 (18.6)	14.4, 23.5
Are you aware of free TB diagnostic services available for TB patients	256 (85.3)	80.8, 89.1
Are you aware of free TB treatment services available for TB patients	267 (89)	84.9, 92.3
Do you know that a person will be attached to TB patient for providing drugs and monitoring drug intake	94 (31.3)	26.1, 36.9
Are you aware that during treatment period, Rs. 500 will be given every month for TB patients regarding nutrition support	38 (12.6)	9.1, 17

*T-True; F-False; DK-Don't know

The study showed that 79.6% [95% CI: 74.7, 84.1] out of 300 participants knew that the cause of TB is bacteria. Majority (93.6%) of the participants knew that TB primarily affects lungs. About 13.3%, 68.3%, and 2.6% of the study participants knew that diabetes, smoking, and excessive alcohol consumption can increase the risk of developing TB, respectively. Most (62.3%) of the study subjects knew that TB is curable. Subjects were aware of free diagnostic services (85.3%), free treatment services (89%) available in the govt setup, but most of them were not aware of DOTS centre and DOTS agent [Table 2].

In the present study about 96.3% of the study participants identified cough droplets as main mode of transmission [Table 3].

Most (96.3%) of the participants answered cough more than 2 weeks followed by blood in sputum (56%) as symptoms of presumptive TB case [Table 4].

Most common source of information in the present study was found to be television (59%) followed by health workers (57.3%) and newspaper (39.3%) [Table 5].

Subjects with college level education status were more aware of TB causative organism, affected organ, sputum examination, droplet mode of transmission, curability and preventability of TB when compared to others groups and the difference was statistically significant [Table 6].

Discussion

In the present study most (25.3%) of the subjects fall under 35-45 years age category and were females (57.7%). Majority of the participants were college going (47.3%), unemployed (44.7%), and belongs to below poverty line (60.3%). About 79.6% of the study participants knew the cause of TB is bacteria whereas only 50% of the study participants knew the cause of TB in Solliman MA *et al.* study.^[4] In a study conducted in Ethiopia by Datiko DG *et al.* only 25.8% of the subjects knew bacteria was the causative organism and only 29% of the subjects knew causative organism in De Luca A *et al.* study done on house hold contacts of TB patients.^[5,6] Although an infectious disease, about 31.6% believed that TB is a hereditary disease in the current study which was similar (36.5%) in a study done by Lin K Set *et al.* and 51.35% of the TB patients identified it as hereditary disease in Nautiyal RG *et al.* study conducted in Uttarakhand.^[7,8] TB is one of the leading cause of mortality in India, but only 12.6% of the study participants knew regarding it. In the current study, only 4.3% participants knew that TB is one of the leading causes of infertility in India, whereas it is 30% in Pakistan study conducted by Ali SM *et al.* on hospital attending patients.^[9] About 13.3%, 68.3%, and 2.6% of the current study participants knew that diabetes, smoking, and excessive alcohol consumption can increase the risk of developing TB, respectively. In the present study majority (93.6%) of the participants knew that TB primarily affects lungs which was about 72% in a study done by Pramanik D *et al.* 80% in Datiko DG *et al.* study and only 22.8% of the study subjects in Easwaran M *et al.* study among rural population.^[3,3,10]

Only 2.3% of the subjects in the present study knew that TB can affect any organ in the body. The current study found that 71.3% study subjects answered sputum is used to diagnose TB which was only 6% from a study done by Kala M *et al.* and 94.1% of the private practioners agreed that sputum exam as

Table 3: Awareness about mode of transmission (n=300)

Mode of transmission	Frequency (%)*
Cough droplets	289 (96.3)
Dishes and other articles used by patient	203 (67.6)
Sexual route	64 (21.3)
Don't know	4 (1.3)

* Total more than 100% due to multiple responses

Table 4: Awareness about symptoms of presumptive TB case (n=300)

Symptoms	Frequency (%)*
Cough more than 2 weeks	289 (96.3)
Fever more than 2 weeks	73 (24.3)
Significant weight loss	124 (41.3)
Blood in sputum	168 (56)
Any abnormality in chest X-ray	121 (40.3)
Don't know	2 (0.6)

* Total more than 100% due to multiple responses

Table 5: Source of information about TB (n=300)*

Source	Frequency (%)
Television	177 (59)
Radio	67 (22.3)
Newspaper	118 (39.3)
Internet	71 (23.6)
Health workers	172 (57.3)
Magazines	37 (12.3)
Friends	109 (36.3)
House hold members	41 (13.6)
Relatives	32 (10.6)
Hoardings	92 (30.6)

* Total more than 100% due to multiple responses

Table 6: Association between education of the subjects and awareness about Tuberculosis and RNTCP services(n=300)

Question	Illiterates (%) (n=27)	School (%) (n=131)	College (%) (n=142)	Chi-square P
What is the cause of TB?Bacteria	5 (18.5)	95 (72.5)	139 (97.9)	0.001
TB is a hereditary disease?False	4 (14.8)	37 (28.2)	54 (38)	0.031
Smoking can increase the risk of developing TB?True	18 (66.7)	93 (71)	94 (66.2)	0.683
TB primarily affects lungs?True	21 (77.8)	123 (93.9)	137 (96.5)	0.001
Specimen used to diagnose TB?Sputum	16 (59.2)	82 (62.6)	116 (81.7)	0.001
Is TB curable?Yes	11 (40.7)	79 (60.3)	97 (68.3)	0.020
Is TB preventable?Yes	9 (33.3)	121 (92.4)	137 (96.5)	0.001
Mode of transmission?Droplet	21 (77.8)	129 (98.5)	139 (97.9)	0.001
Heard/seen DOTS centre?Yes	3 (11.1)	22 (16.8)	31 (21.8)	0.323
Aware of free TB diagnostic services?Yes	19 (70.4)	116 (88.5)	121 (85.2)	0.051
Aware of free TB treatment services?Yes	21 (77.8)	120 (91.6)	126 (88.7)	0.111
Aware of DOTS agent?Yes	6 (22.2)	39 (29.8)	49 (34.5)	0.395
Are you aware that during treatment period, Rs. 500 will be given every month for TB patients regarding nutrition support?Yes	4 (14.8)	6 (4.6)	28 (19.7)	0.001

more reliable test in Patil SK *et al.* study done in Karnataka.^[11,12] Present study found that 62.3% thought that TB can be cured and proportion was 53.1% in Bindu T *et al.* study done in Chennai by.^[13] In the studies conducted by Ali SM *et al.*, Samal J, and Luba TR *et al.*, majority of the participants (87%, 76%, 80.5%) identified TB as a curable disease.^[9,14,15] Regarding treatment duration, 12.29% participants from the present study were aware of duration of TB treatment which was completely contrary where 66% of study subjects were aware of it in a study done by Pramanik D *et al.*, in rural area of West Bengal.^[10] Majority of the participants knew about treatment duration in studies conducted on TB patients by Nautiyal RG *et al.* (82.9%) in Uttarakhand, Dzeyie KA *et al.* (98%) in New Delhi, Huddart S *et al.* (94.3%) in India, and Kigozi NG *et al.* (93.7%) in South Africa, which can be attributed to the knowledge gained in the course of disease management.^[8,16-18] About 43.6% of study participants knew that there is a vaccine related to TB, out of which only 12.9% named the vaccine. In the study conducted by Aggarwal R *et al.* on nurses, 89% of the subjects knew about BCG vaccine and surprisingly only 4.4% and 13.5% of the TB patients knew about the vaccine in Kigozi NG *et al.* study and Nautiyal RG *et al.* study, where as 42.6% of the TB patients were aware of TB vaccine in Ato ML *et al.* study conducted in Ethiopia.^[8,19-20] Majority (89%) participants in the present study answered that TB is preventable, whereas in a study done by Angeline GG *et al.* only 35% knew that transmission of TB is preventable.^[21]

Regarding mode of transmission of TB, 96.3% of the current study participants answered cough droplets as main mode of transmission, which was about 78.3% in a study done by Luba TR *et al.* in China, 63% in Samal J study, 91% in Ali SM *et al.* study and 75.4% in Nigatu DT *et al.* study.^[9,14,15,22] In the present study, 67.6% participants also answered dishes and other articles used by patient and 21.3% opted sexual route as mode of transmission, which indicates lack of awareness regarding TB in the community. In the study conducted by Ali SM *et al.* in Pakistan 51% of the

subjects opted sexual contact as mode of transmission, whereas in other studies conducted on TB patients, 85% opted sharing tooth brush in Kigozi NG *et al.* study and 70% subjects opted sharing dishes as mode of transmission in De Luca A *et al.* study.^[6,9,18] The study conducted by Easwaran M *et al.*, on rural population of Tamil Nadu showed that only 26.1% subjects knew about most common mode of transmission.^[3]

Most (96.3%) of the participants in the current study answered cough more than 2 weeks followed by blood in sputum (56%), significant weight loss (41.3%) and any abnormality in chest X-ray (40.3%) as symptoms of presumptive TB case. Only 24.3% subjects identified fever more than 2 weeks as presumptive TB symptom. In a study done by Afolabi BM *et al.* among rural women in Nigeria, ~35%, 19%, and 16% of the respondents agreed that coughing up blood, weight loss, and chest pain are signs and symptoms of TB.^[23] Surprising results were observed in Samal J study, which stated that 97% of the slum dwellers of Chhattisgarh were aware of TB symptoms and in another study conducted by More BD *et al.* among second year medical graduates, only 60.6% were aware of symptoms.^[14,24] In the study conducted by Nigatu DT *et al.* in the societies of Holeta town, 34.2% of the subjects opted cough, 33.6% opted weight loss, and 17.5% opted persistent fever and in another study conducted by Datico DG *et al.* among general population of Ethiopia, 85.5% identified cough and 17.1% opted fever as symptoms of TB.^[5,22]

Adequate knowledge was present among present study participants regarding free diagnostic services (85.3%) and treatment services (89%) offered by Government to TB cases. As Government hospitals in Telangana provide services for free of cost, people might be assuming the same with TB. Similar results were observed in Samal J study conducted on slum dwellers, which stated that 75% subjects were aware of free treatment services for TB patients in Government hospitals.^[14] The present study also highlights the poor reach of information education and communication (IEC) activities related to TB by the findings that only 18.6% subjects heard about DOTS, whereas in a study done by Bindu T *et al.* about 48.10% study subjects had heard about DOTS.^[13] A study done by Das P *et al.* in Bengal revealed only 2.7% of general population in hospital knew about DOTS.^[25] Present study found that only 31.3% subjects knew that a person will be attached to TB patient for providing drugs and monitoring drug intake. Ministry of Health and Family Welfare, Government of India has announced “Nikshay Poshan Yojana” scheme, which provides incentives for nutritional support to TB patients.^[26] Only 12.6% of the study subjects are aware that during treatment period, Rs. 500 will be given every month for TB patients regarding nutrition support.

Most common source of information in the present study was found to be Television (59%) which was similar (59.3%) to a study done by Hashemi SHB *et al.*, among school students in rural areas of southern Iran.^[27] Other sources of information are from Health workers (57.3%), Newspaper (39.3%),

Friends (36.3%), and Hoardings (30.6%). These findings highlight the importance of health workers in disseminating the health-related information to community and their commitment is directly related to success of any health programmes. In the studies conducted by Datico DG *et al.* and Pengpid S *et al.* Family and friends were most common source of information and in Nigatu DT *et al.* study, it was Media (33.9%) followed by Health Professionals (32.7%).^[5,22,28] Deogaonkar VN *et al.* study on suspected and confirmed TB cases found health staff (76%) as most common source of information.^[29]

Subjects with higher level education status were more aware of TB causative organism, affected organ, sputum examination, droplet mode of transmission, curability, and preventability of TB when compared to others groups and the difference was statistically significant. This difference can be attributed to their exposure to mass media like television, newspaper, knowledge gained from books and as well as teachers. Similar finding was observed in Datiko DG *et al.*, and Huddart S *et al.* studies, but no association was observed between education status and knowledge about TB in De Luca A *et al.* study in India conducted on adult house hold contacts of TB patients.^[5,6,17]

Relevance to the practice of primary care physicians

As India is aiming to eliminate TB by 2025, Primary care physicians and his team plays a key role in promoting National programme activities and sensitise the people regarding TB. As a first point of contact in rural areas, Primary care physicians should be aware of knowledge levels of community regarding TB and RNTCP services in order to plan appropriate sensitisation activities and the current study will come in handy for planning the activities.

Conclusion

Although the awareness of symptoms, causative agent, mode of transmission was reasonably good, knowledge on availability of DOTS centres, services offered through RNTCP and TB possibility leading to death is still poor among rural population. There is a need for proper health education and awareness especially in rural communities and breach the barriers for approaching DOTS centre in the community instead of visiting private clinic, where patient need to spend money out of his pocket. It is the responsibility of every citizen to take part in the activities directed to eliminate TB by 2025 in our country.

Strengths and limitations

Highlighting the awareness in the community regarding TB and related programme services which is the most essential component in eliminating TB is the strength of the study. However, few limitations could not be avoided, particularly restricting to only 6 villages with a small sample size which limits the generalization of the results.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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