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### RESEARCH ARTICLE

#### PRIVATE SECTOR INVOLVEMENT IN TUBERCULOSIS CONTROL IN A TRIBAL DISTRICT OF MAHARASHTRA, INDIA

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#### Abstract

**Introduction:** In India, the private sector caters about seventy percent of TB patients. The majority of private practitioners (PPs) are not updated with current National Tuberculosis Elimination Program (NTEP) guidelines resulting in wrong diagnosis and treatment leading to irrational use of the anti-tuberculosis drugs favoring the emergence and spread of drug resistance.

**Objectives:** 1) To assess the knowledge of PPs about diagnosis and management of tuberculosis as per NTEP guidelines 2) To know the difficulties faced by PPs during the treatment of TB patients and measures to address them as per their perspective.

**Methodology:** Study design & study setting:- a cross-sectional study was undertaken in a tribal district of Maharashtra. 86 PPs interviewed with the help of a structured questionnaire and later conducted focused group discussion (FGD). The data was analyzed with percentages and proportions.

**Results:** The majority 65(75%) of PPs had knowledge about NTEP guidelines but only 21(25%) PPs were updated with the latest changes in the program. PPs expressed concern over the non-availability of diagnostics for extra-pulmonary TB, occasional shortage of drugs, unawareness of patients about the gravity of the disease, and treatment compliance. To address it, they felt the need for awareness activities on social media continuously, round-the-clock services for investigations, incentive for successfully completing treatment to patients along with timely updating PPs about recent updates on NTEP.

**Conclusion:** Continuous quality training regarding basic knowledge and recent updates in NTEP for PPs should be imparted; NTEP implementation at the district needs to be strengthened to overcome the difficulties mentioned by PPs.

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**Introduction:-**

Worldwide, around 10 million people fall ill with tuberculosis (TB) each year. TB is one of the top ten causes of death, and the leading cause ranking above HIV/AIDS. Its cause was remain unknown until 24 March 1882, when Dr Robert Koch announced his discovery of the bacillus subsequently named *Mycobacterium tuberculosis*.<sup>1</sup>

The disease can affect anyone anywhere, but most people who develop TB are adults (about 90%), the male: female ratio is 2:1, and case rates at the national level vary from less than 50 to more than 5000 per 1 million population per year.<sup>2</sup> Targets for TB that are consistent with those set in the End TB Strategy have been included in WHO's Thirteenth General Program of Work, 2019–2023 (GPW 13). Global targets for the funding to be mobilized for TB prevention and care (at least US\$ 13 billion per year by 2022) and TB research and development (US\$ 2 billion per year) were defined for the first time, and new targets set for the total numbers of people to be reached with treatment for disease (40 million globally) and infection (30 million globally) between 2018 and 2022.<sup>3</sup> In India, the private sector, which is estimated to include 80% of all qualified doctors, 75% of dispensaries, and 60% of hospitals, remains an important healthcare provider, catering to between 50% to 80% of those seeking healthcare in urban and rural areas.<sup>4</sup>

It is found that the majority of private practitioners are neither updated with current recommended guidelines nor following them resulting in wrong diagnosis and treatment leading to irrational use of the few available anti-tuberculosis drugs i.e. over-prescription of drugs which may favor the emergence and spread of drug resistance.<sup>5</sup> This finding is substantiated by various studies in India.<sup>6,7</sup> Most PPs do not keep records of their patients and do not have any mechanisms to ensure treatment adherence also mostly they are not aware about recent changes in the treatment and management guidelines and they feel detached. Subsequently, treatment completion in the private sector ranges between 5% and 59%.<sup>8</sup> Little information is available on TB patients in private clinics and very few studies have investigated TB management practices of PP.<sup>9</sup>

**Objectives:-**

1. To assess the knowledge of private practitioners about diagnosis and management of tuberculosis.
2. To know the difficulties faced by PPs during the treatment of TB patients

**Methodology:-**

The present mixed-method study was undertaken in one of the tribal district of Maharashtra. As per the 2011 Census, the district had a population of 2,990,116 and had basically tribal population (Konkni, Warli, Koli, Agri) of 1433497, that is 48% of total population. It has all the three categories of the lifestyles, Urban (Nagari), Coastal (Sagari) and Mountains-Hilly Region (Dongari). Regarding public health infrastructure, there was no tertiary care health facilities like civil hospital or government medical college, so complicated cases were being referred nearby districts. Along with hilly and hard to reach areas, means of transport were also not adequate. All these factors responsible for increased morbidity and mortality. Contribution of PPs in NTEP was very less as per Nikshay based record of the past years. Details of registered private practitioners sought from civil surgeon office and Indian Medical Association. Most of the PPs practice OPD basis only and there were very few hospitals.

**Study Procedure-**

All 112 private practitioners working in the district were explained about the nature of the study and invited to participate. After obtaining informed consent from all the participants, pretested semi-structured questionnaire detailing socio-demographic information with knowledge, attitude, and practices regarding Tuberculosis control was distributed online with the help of Google form. The participants were followed up online as well as telephonically a maximum of three times. Eighty six (77%) had answered and returned back the questionnaire. The remaining 23% did not revert back due to their busy schedule, patient overload along with Covid-19 pandemic and therefore excluded from the study. To know the difficulties faced by PPs during the treatment of TB patients and measures to address them as per their perspective, the leading practitioners from all blocks were requested for focused group discussion as per their convenience. The discussion was recorded, transcribed, and analyzed after generating domains. The study was completed from May 2021 to July 2021. Strict confidentiality was maintained during the process of data collection, the data was entered in Microsoft Excel and analyzed. All the required permissions, including ethical clearance, were obtained before conducting a study. After data collection, data analysis was done using statistical software trial version of SPSS version 23.

**Results:-**

This study was conducted among 86 PPs in the district .Their socio-demographic distribution is as follows

**Table No.1:-** Socio-demographic distribution of private practitioners.

Parameter	Variable	Frequency	Percentage
<b>Age group</b>	25-40	61	71
	41-50	19	22
	51-60	6	7
<b>Gender</b>	Male	56	65
	Female	30	35
<b>Qualification</b>	MD/MS	4	5
	MBBS	2	2
	BAMS	58	68
	BHMS	22	25
<b>Duration of service</b>	<5 years	25	29
	5-10 years	23	27
	10-15 years	29	34
	>15 years	9	10

As shown in Table-1, total 86 private practitioners participated. Out of them, majority were 58(68%) Ayurveda doctors (BAMS) followed by Homeopathic doctors (BHMS) which were 22 (25%). The rest were MBBS & MD/MS. Most of the participant i.e. 61 (71%) were in the age group 25-40 years while 19 (22%) were in the 41-50 years age group and 6 (7%) belonged to the 51-60 years age group. The mean age of the participants was 39.86 years. As far as gender was considered, male 56(65%) outnumbered females 30(35%). The mean years of practice in the private health setup was 11.19 years.

**Table No.2:-** Current knowledge, Attitude and Practice of PPs about NTEP.

Questions	CORRECT	WRONG
Suspect symptoms	65(75%)	21(25%)
Samples for diagnosis	35(41%)	51(59%)
Medicine for cure	82(95%)	4(5%)
Cure period of sensitive TB	86(100%)	0(0%)
Follow-up during treatment	79(92%)	7(8%)
Prophylaxis for children	25(29%)	61(71%)
If the patient has DM, suspect?	32(37%)	54(63%)
Dot provider	38(44%)	48(56%)

In this study, as shown in Table-2, the majority 65 (75%) of doctors were aware about TB suspect symptoms while few doctors 21(25%) were updated with the latest changes in the number of samples required to diagnose TB. It was very good to find that 95% of PPs knew which medicines used in the treatment of TB while all the 86 i.e. 100% participants had knowledge of correct duration of treatment of TB. Similarly, most of the treating doctors (92%) had an idea about when to call patients for follow-up during the course of the treatment. Regarding prophylaxis that should be prescribed to children below the age of 6 years in case any one of the family member is diagnosed as pulmonary TB, in such scenario only 25(29%) doctors were aware and used to prescribe prophylactic medicines to the eligible children.

As we have controlled communicable diseases very well but at the same time there is a surge in non-communicable diseases. Diabetes Mellitus (DM) is one of them. TB is one of the opportunistic infections in diabetes. So it is routinely advised to check random blood sugar if a patient is diagnosed with TB. So one or two-day cough in diabetes patients should be considered as suspect, but only 32(37%) treating doctors were updated about this fact. The same results were found regarding changes in the definition of DOT provider i.e only 38(44%) PPs were aware about who can be a DOT provider.

**Table No. 3:-** Current knowledge, Attitude and Practice of PPs (Faculty/pathy wise) about NTEP.

Variables	CORRECT RESPONSES			TOTAL (86)
	MBBS,MD/MS (6)	BAMS(58)	BHMS(22)	
Suspect symptoms	6(100%)	41(71%)	18(81%)	65(76%)
Samples for diagnosis	6(100%)	18(31%)	11(50%)	35(41%)
Medicine for cure	6 (100%)	55(95%)	21(95%)	82(95%)
Cure period of sensitive TB	6(100%)	58(100%)	22(100%)	86(100%)
Follow-up during treatment	6(100%)	49(84%)	14(67%)	79(92%)
Prophylaxis for children	5(83%)	13(22%)	7(32%)	25 (29%)
If the patient has DM, suspect?	6 (100%)	15(26%)	11(50%)	32 (37%)
DOTS provider	4(67%)	25(43%)	9(41%)	38 (44%)

As shown in Table-3, as per medical curriculum, obviously allopathic doctors have more knowledge than other faculties/pathys, while ayurvedic and homeopathic doctors had more or less equal knowledge about NTEP.

**Table No. 4:-** Current knowledge, Attitude and Practice of PPs about NTEP.

Outcome Indicators	CORRECT	WRONG
Co-testing HIV	77(90%)	9(10%)
Nutrition scheme	52(60%)	34(40%)
After diagnosis, test for DM	26(30%)	60(70%)
TB notifiable?	64(75)	22(25%)
Confirmatory test of TB	37(43%)	49(57%)
MDR TB	52(60%)	34(40%)
Practice question	40(47%)	46(53%)
The best method to contain TB	71(83%)	15(17%)

As shown in Table-4, HIV–AIDS is immune-compromised disease syndrome, opportunistic infections are common in such patients, TB is the most common in HIV–AIDS patients.so as per NTEP guidelines, mandatory testing sputum for AFB in HIV positive cases and mandatory testing of HIV in diagnosed TB cases i.e. bidirectional screening has been advised and most of the doctors 77(90%) were aware and used to advise about it.

In our study, 52(60%) doctors have correct updates about Nutrition Scheme launched by Government of India in order to improve nourishment status of TB patient. Few doctors 26(30%) usually advice test for random blood sugar if patient get diagnosed as TB. It was good finding that recently majority of doctors 47(75%) started to notify TB cases diagnosed by them to the government facility. It was found that still there was confusion among treating doctors about confirmatory test for TB as about half of the doctors 37(43%) consider and advise X-ray chest, Montoux test & ESR instead of sputum for AFB and CBNNAT as confirmatory for TB

Fifty two (60%) PPs knew what is Multi Drug Resistant(MDR)Tuberculosis. When patient was sputum negative but X ray was abnormal, 47% of the PPs used to start AKT directly &53% of the PPs advice CBNAAT for confirmation along with routine antibiotics. Most of the PPs thought that the best method to contain TB is early detection of TB and early initiation of AKT.

**Table No. 5:-** Current knowledge Attitude and Practice of PPs(Faculty/pathy wise) about NTEP.

Variables	CORRECT RESPONSES			P value	TOTAL (86)
	MBBS,MD/MS (6)	BAMS (58)	BHMS (22)		
Co-testing HIV	6(100%)	49(84%)	12(55%)		77(90%)
Nutrition scheme	5(83%)	29(50%)	16(73%)		52(60%)
After diagnosis, test for DM	4(67%)	14(24%)	8(36%)		26(30%)
TB notifiable?	6(100%)	47(81%)	11(50%)		64(75)
Confirmatory test of TB	6(100%)	22(38%)	9(41%)		37(43%)
MDR TB	5(83%)	31(53%)	11(50%)		52(60%)

Practice question	4(67%)	27(47%)	9(41%)	40(47%)
The best method to contain TB	<b>5(83%)</b>	<b>44(76%)</b>	<b>12(55%)</b>	71(83%)

As shown in table-5, as per medical faculty, obviously Allopathic doctors have more knowledge than other pathy, while Ayurvedic and Homeopathic doctors had more or less equal knowledge about NTEP.

### **Focussed group discussion (FGD)**

The FGD was conducted with the leading PPs of the tribal district. It lasted around 3 hr & 45 min. Prior consent was taken. Privacy and confidentiality was maintained. It was recorded. Co-investigator accompanied while FGD. He wrote the transcript of the FGD.

When asked about issues/problems faced in implementation of NTEP, one of the participant said that though pulmonary TB was most prevalent, extra-pulmonary TB cases were there but due to lack of diagnostic facility in their practice area, remain undetected. Also in addition ignorance and poverty made the situation worst. PPs expressed concern over the non-availability of diagnostics for extra-pulmonary TB.

Few of them complained about drug shortage at government facilities as most of the patients were referred for free drugs but “sometimes there was no stock at district TB center”, one of PPs pointed out. Already there was long duration treatment and it was very difficult to keep adherence to treatment, in that shortage of drugs caused harassment to the patients mentally as well as economically leading treatment failure cases.

Another practitioner expressed anguish over irresponsible behavior of government staff as many patients were misguided or denied services when they approached health facility. In case TB patient requires admission, no indoor facility was available, such serious patient had to travel to tertiary care hospitals in nearby district or Mumbai. Also, there was shortage of staff in government facilities which was affecting health care services to TB patients. They also expressed concern over unawareness of patients about the gravity of disease, patient reliability more on Bhagat (traditional healer) than modern health system and treatment compliance. One of the PPs said, “Ohh! It is very difficult to find out each and every case, really Poverty and illiteracy is curse.”

It is responsibility of district administration to aware us whatever changes going to take place in the program on continuous basis so that we could work accordingly. In the last moment of interview, one of the participant said “we were not updated with current guidelines, we felt disconnected from NTEP.

**Current problems/difficulties most commonly faced by PPs in NTEP:-** Lack of diagnostic facility to diagnose extra-pulmonary TB cases with drug and human resource shortage at government facilities were major issues raised by PP as most of the patients were referred for free drugs and NAAT testing.

There was no any single indoor facility for TB patients in the district along with irresponsible behavior of government staff as many patients were misguided or denied services when they approached health facility.

Lastly genuine issue was the unawareness of patients about the gravity of disease, patient reliability more on Bhagat (traditional healer) than modern health system and treatment compliance

### **Measures to address these problems/difficulties faced by PPs in NTEP:-**

To address it, they felt need of awareness activities on social media continuously. Availability of round the clock diagnostic as well as treatment services in the block level health facilities along with adequate staff and drug stock should be very much essential. They expect incentives for successfully completing treatment to patients indirectly will improve compliance.

In the last, all PPs urged the government to create robust system for monitoring and regular refresher training as well as current guidelines to be circulated among private sector on continuous basis to make India TB free. These hurdles can be removed and TB can be eliminated only when public and private health sector work with hand in hand.

### **Discussion:-**

Private healthcare provider plays a major role in delivering health services in most low-income countries, including to the poorest communities and their Involvement is crucial in increasing case detection and improving treatment

outcomes. A large proportion of TB patients in India are first seen by PPs and treated by them. TB Elimination programs in given area can't achieve their goal without the involvement of the Private sector. The findings of our study indicate that PPs had good basic knowledge about the NTEP program but were not aware of recent changes in guidelines while studies<sup>5,7,8,9</sup> conducted elsewhere show that knowledge and involvement of PPs in NTEP was very low.

In our study, 63% of doctors advised sputum and CBNAAT as a confirmatory test for diagnosis while it was 12% in a study done at Delhi by Singla et al<sup>7</sup>, while 15% advised X-ray compared to other studies<sup>6,7</sup> which found that among PPs, there was marked reliance on X-ray in studies by Singla et al<sup>7</sup> (85%) and Datta et al<sup>6</sup> (68%) respectively. Similarly, sputum examination was neglected for initial diagnosis treatment monitoring and as a criterion to stop treatment. None of the doctors was giving treatment under supervision in the study conducted at Hoogley<sup>6</sup> district while in our study also 15% PPs advised x-ray during treatment follow-up to know status. In our study, 90% of doctors know about drug regimens along with 6 months Anti Koch's Treatment (AKT) while in studies conducted by Singla et al<sup>7</sup> and Datta et al<sup>6</sup> it was 27% & 29 % respectively. Literature review done by Shah HD et al<sup>9</sup> showed significant increase in notification after public private mix partnership.

The in-depth group discussion pointed out that there is need of continuous quality training regarding recent updates in NTEP for PPs as mentioned in study conducted by Uplekar et al<sup>10</sup> highlights need to educate PPs and their TB patients in such a way that PPs could be meaningfully involved in efforts to revitalize the national TB control program.

PPs also expressed concern over non-availability of diagnostics for extra-pulmonary TB. Also there exist other issues like occasional shortage of drugs, unawareness of patients about gravity of disease and treatment non-compliance. To address it, they felt need of awareness activities on social media continuously along with round the clock services for investigations. In addition, they expected incentives for successfully completing treatment to patients indirectly will improve compliance.

It was also observed that allopathic doctors have better knowledge than other pathys as allopathic curriculum consist of basic knowledge about TB/NTEP.

### **Conclusion:-**

Majority of PPs had knowledge about TB diagnosis, treatment and management but only few PPs were updated with latest changes in the NTEP guidelines. The hurdles mentioned by PPs regarding TB were dire need of their own basic as well as updated guidelines training on continuous basis, non-availability of diagnostics required for extra-pulmonary TB and irregular supply of logistics including drugs.

To address it, they felt need of awareness activities on social media continuously along with round the clock services for investigations, Indian Medical Association (IMA) is always ready to share social responsibility but don't receive appropriate response from public health department. In addition, they expect incentives for successfully completing treatment to patients indirectly will improve compliance, very much essential to cure TB and prevent emergence of drug resistance.

NTEP guidelines regarding treatment and prevention along with digital monitoring tools are changing very often. With holistic approach, to achieve five years early ,TB elimination Goals i.e. till 2025 as compared to rest of the world, GOI launched many new schemes like NIKSHAY MITRA ,TB MUKT PANCHAYAT etc. So it is difficult for PPs to keep pace with updated guidelines.

In the last, all PPs urged the government to create robust system for Monitoring and regular refresher training as well as current guidelines to be circulated among private sector on immediate basis to make India TB free. These hurdles can be removed and TB can be eliminated only when public and private health sector work with hand in hand.

### **Recommendations:-**

Doctors working in the private health set up should be sensitized not only about gravity of TB prevalence but also their role envisaged under National Tuberculosis Elimination Programme. Regular training/refresher

training/CME/workshop such activities should be carried out with coordination with IMA (Indian Medical Association) on continuous basis. Appropriate Public-Private Mix Partnership Model should be created for smooth coordination that result in early detection and early initiation of treatment of all types of TB cases in the society to achieve the goal of TB elimination.

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### **Competing Interest:-**

No conflict of interest.

### **Authors' contributions-**

Dr Deepak designed the study, performed the statistical analysis wrote the protocol and wrote the first draft of the manuscript. Dr.Dhananjay Mankar and Dr.Yogita Bavaskar managed the analyses of the study and Dr.Yogita Bavaskar managed the literature searches and finalised the manuscript. All authors read and approved the final manuscript.

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