A PATIENT CENTRED APPROACH TO THE MANAGEMENT OF PATIENTS SUFFERING FROM LUNG TUBERCULOSIS IN INDIA:

A SYSTEMATIC REVIEW

Submitted in fulfilment of the requirements for the degree of

Master of Medicine

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2019, Kaunas
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SUMMARY

Author: Kim Thomas

Title: A patient centred approach to the management of patients suffering from lung tuberculosis in India: a systematic review

Introduction: Tuberculosis (TB) is a chronic granulomatous disease caused by the bacteria *Mycobacterium Tuberculosis* complex. TB most commonly affects the lungs, and this is known as pulmonary TB. In 2011, the World Health Organisation (WHO) estimated a global incidence of 9.6 million TB cases [1]. Of this, India was considered to be the highest TB burden country with an estimated incidence of 2.2 million cases out of the global incidence and about 150,000 to 350,000 deaths per year [1, 2]. In 1997, the government of India had introduced a scheme known as the Revised National TB Control Program (RNTCP), as a solution to combat this problem. However, India has a very fragmented health care system, mainly involving the public and private health sectors. Patient centred care and their appropriate TB management depends heavily on the type of healthcare provider one approaches in India.

Objectives: The aim of this systematic review is to study the patient centred approaches for the management of pulmonary TB patients by physicians in India. The study will review the awareness of private practitioners in particular in diagnosing and treating TB against three main RNTCP standards:

Standard 2: Awareness or practices of sputum smear for persons with presumptive pulmonary tuberculosis

Standard 8: Awareness or practice of correct treatment regimen for new TB case (any drug regimen as meeting this standard as long as it contained the correct drugs and duration of treatment [e.g. 2 months of isoniazid, rifampicin, pyrazinamide and ethambutol, followed by 4 months of isoniazid and rifampicin], irrespective of whether the regimen was daily or intermittent)

Standard 9: Awareness or practice of a supervised (including directly observed therapy [DOT]) approach for the treatment of tuberculosis
**Method:** Numerous reliable websites were accessed such as Patient.co.uk, NHS.co.uk, WHO reports. Databases such as PubMed, MEDLINE and ScienceDirect were used extensively. MeSH terms such as “patient pathway in managing tuberculosis in India”, and Boolean phrases such as “public sector AND private sector” were used to generate articles relevant to my study. Inclusion criteria such as “patients with pulmonary tuberculosis in India” and exclusion criteria such as “patients with pulmonary tuberculosis in other countries” were also set.

**Results:** Overall, there was less than 50% adherence against all three standards. Only one study noted a greater than 50% adherence to Standard 2. Comparatively, only few private practitioners were aware or put into practice Standard 2. Surprisingly, there was least awareness/practice of prescribing the correct anti-TB regime (Standard 8). Two studies noted a greater than 50% adherence to Standard 9 and findings suggested that overall private practitioners were more aware of Standard 9.

**Conclusion:** In order to correctly manage TB and deliver appropriate patient centred care, private practitioners should be made aware of the importance of referring and following the RNTCP guidelines. They should become more compliant to the important diagnostic investigations, work on implementing them and report their cases systematically.

**ACKNOWLEDGEMENTS**

I would like to express my sincere gratitude towards my supervisor, Head Prof. Skidriaus Miliauskas for giving me this opportunity to complete this review. I would also like to thank my beloved family for supporting my decision to go to India to study more about tuberculosis and for all the love and support I receive from them daily.

**CONFLICTS OF INTEREST**

The author reports no conflicts of interest.
ABBREVIATIONS

AYUSH- The Ministry of Ayurveda, Yoga, Unani, Siddha and Homeopathy

DOT- Directly Observed Treatment

ESR- Erythrocyte Sedimentation Rate

MDR-TB- Multi-Drug Resistant Tuberculosis

RNTCP- Revised National Tuberculosis Control Program

TB- Tuberculosis

WHO- World Health Organisation
INTRODUCTION

Tuberculosis (TB) is a chronic granulomatous disease caused by the bacteria *Mycobacterium Tuberculosis* complex [3]. It is most commonly spread between person to person through air droplets, i.e. when people sneeze or cough. Most commonly it affects the lungs, and this is known as pulmonary TB [3]. TB has many extra pulmonary forms which can affect bones and other organs.

In pulmonary TB, the body’s macrophages engulf the foreign organisms and carry them to the hilar lymph nodes in order to defend the body from infection [3]. From here, the organisms could spread to other sites in the body via the blood stream or lymphatics. Small granulomas are formed in these sites of the body within which the mycobacterium remain [3]. This could then take one of few routes – they could heal spontaneously (80% of cases), remain dormant within an otherwise healthy individual (latent TB) or develop into active TB [3].

In those with latent TB, the World Health Organisation (WHO) estimates a 10% lifetime risk of them becoming affected [4]. In persons with compromised immune systems, such as people living with human immunodeficiency virus (HIV), malnutrition, overcrowded population with poor surroundings and smokers, the risk is thought to be much higher [4].

In 2011, the WHO estimated a global incidence of 9.6 million TB cases [1]. Of this, India was considered to be the highest TB burden country with an estimated incidence of 2.2 million cases out of the global incidence [1, 2]. This is due to the rapidly rising population; consequently leading to overcrowding, poverty, unhygienic surroundings and malnutrition [2].

India suffers from a very fragmented health care system, making it difficult to tailor treatments to each patient or develop a fixed patient centred approach towards the management of TB. In India, access to the healthcare system is either through the public or private sector [5]. For most patients, rich or poor, the private sector is the first point of contact with the healthcare system [5]. Approximately two thirds of the inpatients and three fourths of the outpatients in the country are catered for by the private sector [5]. At least 2.2 million patients with TB annually are being diagnosed and treated within this sector, while about 1.5 million TB patients are treated by public hospitals [6]. Yet, there still is a discrepancy in the number of patients with TB who are left untreated. In fact, it is estimated that only 16% of patients with drug resistant TB are receiving appropriate treatment [6]. This review will label this increasing number of untreated TB patients as Dilemma 1 that India faces in controlling TB. It was thought that the reason for this dilemma was inadequate treatment due patients being unable to afford TB medications. As per consequence, their
disease condition does not improve; thereby contributing to the poor and alarming response rate of patients acquiring TB. Another dilemma, Dilemma 2, is that in 2016 at least 40% of 10.4 million TB cases were either undiagnosed or unreported [5]. India was responsible for 25% of these ‘missing cases’ globally [5]. Therefore, in order to combat TB, these two dilemmas need to be addressed.

Both these issues can only be tackled by the country’s healthcare system. In order to combat Dilemma 1, free treatment should be provided by the government to TB patients. For Dilemma 2, there needs to be a rigid, effective and efficient system that can be accessed by the healthcare professionals of the country to notify cases, diagnose and treat patients successfully.

In an effort to address these issues and eliminate further aggravation of the situation, the government of India introduced a scheme known as the Revised National TB Control Program (RNTCP) in 1997 [7]. The RNTCP, a national health programme aims to provide free care and treatment to all patients in India with TB [7]. The objective of this programme is to treat patients with TB in India immediately, without a waiting period, and without a charge for diagnosis or treatment [8]. The programme complies with the WHO recommendations for the diagnosis and management of TB. These RNTCP guidelines are outlined in Table 1. The WHO recommended a strategy known as Directly Observed Treatment (DOT). This was adopted by RNTCP and aimed to treat more than a billion people in 632 districts [8, 9]. These DOT centres are responsible for dispensing treatment, observing treatment doses swallowed, patient follow-up and patient retention in care [8]. The service is delivered through designated institutions across the country; to both public and private sectors [7].
Table 1. Revised National Tuberculosis Control Programme standards

Satyanarayana et al [7]

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
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<tbody>
<tr>
<td>Standard 1</td>
<td>An individual with cough of &gt;2 weeks should be considered a TB suspect</td>
</tr>
<tr>
<td>Standard 2</td>
<td>TB suspects should have two sputum samples submitted for microscopic examination</td>
</tr>
<tr>
<td>Standard 3</td>
<td>EPTB should be diagnosed based on positive tissue culture from an extra pulmonary site, positive histological findings, consistent radiological findings or strong clinical evidence</td>
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<tr>
<td>Standard 4</td>
<td>CXR alone is unreliable for diagnosing TB – sputum examination should be performed for suggestive CXR findings</td>
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<tr>
<td>Standard 5</td>
<td>Criteria for smear-negative diagnosis: four negative sputum samples, failure of cough to improve on broad spectrum antibiotics and CXR findings suggestive of TB: fluoroquinolones, rifampicin and streptomycin should never be used for empiric treatment</td>
</tr>
<tr>
<td>Standard 6</td>
<td>Similar work-up recommended to diagnose TB in children, including sputum examination, CXR, history of contact with an active TB case in the last 2 years and use of TST</td>
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<tr>
<td>Standard 7</td>
<td>A DOT provider should help the patient take medication, thereby ensuring adherence</td>
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<tr>
<td>Standard 8</td>
<td>Same recommended first line regimen and dosing standards, although intermittent (every other day or three times weekly) treatment is preferred; multi blister combi packs containing all the drugs are provided by the government</td>
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<tr>
<td>Standard 9</td>
<td>All standard treatment regimens in RNTCP areas are supposed to be provided by DOT</td>
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<tr>
<td>Standard 10</td>
<td>To monitor response to treatment in smear-positive TB cases, two sputum smears should be repeated at 2 and 4 months and at treatment completion</td>
</tr>
<tr>
<td>Standard 11</td>
<td>DST should be performed for individuals who are close contacts of known MDR-TB patients with a positive sputum smear, those who remain sputum smear-positive after 5 months of treatment and those who default, fail or relapse on a course of treatment with a positive sputum smear (i.e. sputum smear-positive Category II patients)</td>
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<tr>
<td>Standard</td>
<td>Recommendation</td>
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<tr>
<td>12</td>
<td>Patients with suspected MDR-TB shoulder be treated with a standardised regimen of 6 drugs</td>
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<tr>
<td>13</td>
<td>Treatment cards for all patients on treatment should be maintained at RNTCP DOTS centres</td>
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<tr>
<td>14</td>
<td>Routine HIV testing of all newly diagnosed TB patients with unknown HIV status is recommended</td>
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<tr>
<td>15</td>
<td>All HIV co-infected TB patients are considered seriously ill and should be started on anti-tuberculosis treatment expeditiously; these patients should be referred to National AIDS control Programme centres to be considered for initiation on ART and administration of cotrimoxazole prophylaxis</td>
</tr>
<tr>
<td>16</td>
<td>No similar recommendation has been made by the RNTCP</td>
</tr>
<tr>
<td>17</td>
<td>Routine screening for DM should be performed for all TB patients with unknown DM status, relevant comorbid conditions such as smoking and pregnancy should be recorded on the treatment card</td>
</tr>
<tr>
<td>18</td>
<td>All household contacts of individuals with smear-positive TB should be screened for TB symptoms, those with cough should undergo sputum examination</td>
</tr>
<tr>
<td>19</td>
<td>Household contacts &lt;6 years of age who are asymptomatic should receive INH chemoprophylaxis</td>
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<tr>
<td>20</td>
<td>RNTCP guidelines for infection control in hospital settings recommend administrative controls, environmental controls and personal protective measures</td>
</tr>
<tr>
<td>21</td>
<td>All TB cases including those detected in the private sector should be mandatorily notified to designated nodal officers in the districts</td>
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</table>

RNTCP = Revised National Tuberculosis Control Programme; TB = tuberculosis; EPTB = extra-pulmonary TB; CXR = chest X-ray; TST = tuberculin skin test; DOT = directly observed treatment; H, INH = isoniazid; DST = drug susceptibility testing; MDR-TB = multidrug-resistant TB; HIV = human immunodeficiency virus; DM = diabetes mellitus; ART = antiretroviral therapy.

As majority of the patients access the private sector, the RNTCP attempts to deliver public services to the private sector through public-private partnerships (PPP) [5]. In attempt to identify ‘missing cases’, the RNTCP launched Nikshay, an online notification portal accessible to all healthcare providers, laboratories and diagnostic facilities, both public and private, nationwide [5]. RNTCP expects all private healthcare providers to notify patients with TB irrespective of a PPP through
Nikshay [5]. Figure 1 illustrates an example of the expected pathway of a patient suspected to have TB.

Figure 1. Expected pathway of patients seeking TB care at a private tertiary care teaching hospital in Bengaluru, India

Siddaiah et al [5]

AFB, acid-fast bacilli; AKT4, anti-TB medication; DOT, direct observed treatment; ICD-10, International Classification of Diseases 10th Revision; MRD, Medical Records Department; RNTCP, Revised National Tuberculosis Control Programme; TB, tuberculosis; TBHV, TB health visitor
Despite efforts to address both pressing dilemmas, there is still an increasing incidence of TB within India and continues to be a growing burden to the country. India is still considered to be the country with the highest TB burden with about 150,000 to 350,000 deaths per year with an incidence of 2.2 million out of 9.6 million cases worldwide [1].

**AIM AND OBJECTIVES**

Having recognised the importance of private practitioners in delivering care to majority of the Indian population, the government has tried to target them and include them within programmes such as the RNTCP. Regardless of there being an efficient system as the RNTCP, there still does not seem to be an improvement in the management or eradication of TB. This means the issue needs to be addressed at its core. The knowledge and awareness of private practitioners in appropriately diagnosing and treating TB needs to be reviewed. This is essential to eradicate TB and its burden on the Indian population. Furthermore, the United Nations Sustainable Development Goals outline that, in order to end TB by 2030, the ‘missing’ TB cases are to be identified and treated successfully [5].

The aim of this systematic review is to analyse the patient centred approaches for the management of pulmonary TB patients by physicians in India. In particular, the study will review the awareness of private practitioners in diagnosing and treating TB.

**Objectives of the thesis**

This aim will be met via the following objectives:

1. Define TB and address the need for this literature review.

2. Appraisal of the comprehensive set of literature to identify, highlight and reason the disparity in the management of TB that a patient may face in a fragmented healthcare system as that is seen in India. This will be done by systematically reviewing the literature available within the past ten years done in India.

3. The awareness of private practitioners will be assessed by evaluating against three main standards highlighted in the RNTCP. The following standards have been modified to be broader in order to be able to review against the available literature but in their essence are, as per the RNTCP guidance:
Standard 2: Awareness or practice of sputum smears for persons with presumptive pulmonary tuberculosis.

Standard 8: Awareness or practice of correct treatment regimen for new TB case (any drug regimen as meeting this standard as long as it contained the correct drugs and duration of treatment [e.g. 2 months of isoniazid, rifampicin, pyrazinamide and ethambutol, followed by 4 months of isoniazid and rifampicin], irrespective of whether the regimen was daily or intermittent [7]).

Standard 9: Awareness or practice of a supervised (including DOT) approach for the treatment of tuberculosis.
METHOD

Initially, I searched for the term ‘Tuberculosis’ in Google to have a better understanding of TB and its pathophysiology. I accessed numerous websites such as Patient.co.uk, NHS.co.uk, WHO report as they are reliable sources.

After having read into Tuberculosis diagnosis and management, I did more research into the management of tuberculosis. I referred to National Institute of Health and Excellence (NICE) guidance and read specific articles about this. From what I read, I recognized that there is a dangerously growing problem in India which is multi-drug resistant tuberculosis. During my elective in India, I observed multiple patients suffering from this disease and the difficulty in managing this due to drug resistance, differences in patient care at different hospitals and the role of having economically attractive ways to manage TB. Following different pulmonary physicians in different hospitals, I also noticed that each doctor was using a somewhat different approach to the diagnosis and treatment of TB. There was a stark contrast between patients being treated privately and patients being treated via government funds. I obtained books from the Lithuanian university library and the library website to access databases such as PubMed, MEDLINE and ScienceDirect to gain access to numerous articles in an effort to understand the concept of a literature review. My personal experiences in clinics in India contributed vastly towards my knowledge regarding a TB patient’s mind-set and their treatment pathways.

I have illustrated in the following table the searches that I conducted on the above-mentioned databases. I used MeSH terms such as “management of tuberculosis in India”, “patient pathway in managing tuberculosis in India”, and Boolean phrases such as “public sector AND private sector” to generate articles relevant to my study (Table 3). Of them, I chose articles by reading their abstract. The relevance of the article to my structured review and its correspondence to my inclusion criteria (Table 2) is what I used as a benchmark to select the appropriate systematic reviews.

Table 2. Inclusion and exclusion criteria for choosing relevant studies
<table>
<thead>
<tr>
<th>Inclusion criteria:</th>
<th>Exclusion criteria:</th>
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<tr>
<td><strong>Subjects:</strong></td>
<td><strong>Subjects:</strong></td>
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<tr>
<td>• Men and women</td>
<td>• Patients with other types of tuberculosis</td>
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<tr>
<td>• Patients with pulmonary tuberculosis in India</td>
<td>• Patients with pulmonary tuberculosis in other countries</td>
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<tr>
<td>• Aged 20-80</td>
<td>• Children</td>
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<td><strong>Interventions:</strong></td>
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<tr>
<td>• Studies that analysed patient pathways in accessing treatment – i.e. reviewing treatment by private practitioners, public sector</td>
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<tr>
<td>• Reviewed practitioners adherence to the RNTCP guidelines</td>
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<tr>
<td>• Described the</td>
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<td><strong>Studies:</strong></td>
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<td>• Cross sectional studies</td>
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<td>• Systematic review</td>
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<tr>
<td>• Cohort or prospective studies</td>
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<td>• Studies published over last 10 years were considered.</td>
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</table>

*Table 3. PubMed search results*
<table>
<thead>
<tr>
<th>Search ID</th>
<th>Search Terms</th>
<th>Search Options</th>
<th>Hits</th>
</tr>
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<tbody>
<tr>
<td>E1</td>
<td>(tuberculosis) OR tb) AND management) AND India) OR treatment) (Phrase1)</td>
<td><strong>Search modes</strong> - Boolean/Phrase <strong>Sort by</strong>: Relevance</td>
<td>1367800</td>
</tr>
<tr>
<td>E2</td>
<td>Phrase 1</td>
<td><strong>Limiters</strong> - English Language <strong>Search modes</strong> - Boolean/Phrase <strong>Sort by</strong>: Relevance</td>
<td>18790</td>
</tr>
<tr>
<td>E3</td>
<td>Phrase 1</td>
<td><strong>Limiters</strong> - English Language; Human; Linked full text, last 10 years <strong>Search modes</strong> - Boolean/Phrase</td>
<td>1329</td>
</tr>
<tr>
<td>E4</td>
<td>Tuberculosis management by private practitioners (Phrase 2)</td>
<td><strong>Limiters</strong> - Linked Full Text; English Language; Human, last 10 years <strong>Search modes</strong> – SmartText Searching <strong>Narrow by Subject Age</strong> - all adult: 20+ years <strong>Sort by</strong>: Relevance</td>
<td>68</td>
</tr>
<tr>
<td>E5</td>
<td>Phrase 2</td>
<td><strong>Limiters</strong> - Linked Full Text; English Language; Language: English, last 10 years <strong>Search modes</strong> - SmartText Searching <strong>Sort by</strong>: Relevance</td>
<td>42</td>
</tr>
</tbody>
</table>

Similar searches were generated in MEDLINE (EBSCO), Science Direct, Cochrane library.
A number of studies were generated from the above searches. The main studies that are analysed in this literature review were those that reviewed private healthcare system against Standards 2, 8, 9.

RESULTS AND DISCUSSION

The systematic review by Satyanarayana et al compared the care between public and private health sector against these domains and the quality of TB care in India among these sectors.

21 studies assessed the awareness of both public and private practitioners about the importance of sputum smear in diagnosing TB [7]. The study found considerable heterogeneity ranging from as low as 17% to as high as 94% [7, 10, 11]. Only 59% doctors advised patients with cough of 2–3 weeks’ duration to undergo sputum examination (Standard 2) [7]. All 14 studies that assessed awareness of treatment (Standard 8) reported that less than 50% providers were aware of the correct anti-TB treatment for newly diagnosed TB [7]. Of the 4 studies that assessed knowledge of the private doctors, it was reported that more than 90% were aware of DOT or of a supervised treatment approach [7]. Two studies reported that younger doctors or trainees were more likely to believe in the DOT approach [7, 12, 13].

Another study by Achanta et al reviewed the management practices by private practitioners in Andhra Pradesh [14]. The study outlined that less than 40% of them prescribed the standard TB treatment regimens practised by DOT (Standard 8), prescribed culture and drug susceptibility testing or appropriate treatment for drug resistant TB [14]. Less than 40% were aware of the DOT approach [14]. One third of private doctors did not follow standards for suspecting pulmonary TB based on a cough of 2 weeks or more, and less than 45% utilised the sputum smear examination (Standard 2) as the standard diagnostic practice as recommended by the guidelines [14]. Only one private practitioner followed all treatment standards altogether [14].

Similar results were noted in the study by Uplekar et al regarding treatment from private practitioners [15]. The study identified that standard treatment regime was not followed. 77% advised sputum sample (Standard 2) and chest X-ray, and 60% of the practitioners discussed the cases with senior doctors before confirming TB diagnosis [15].

The above results regarding the percentage adherence to each Standard by private practitioners in each of the above studies is illustrated in Figure 2.

**Figure 2. A bar chart to illustrate the percentage of adherence to the three standards (outlined in objectives) by private practitioners.**

*Study 1 Satyanarayana et al [7], Study 2 Achanta et al [14], Study 3 Uplekar et al [15]*
Overall, the results showed a less than 50% adherence against all three standards. Only one study noted a greater than 50% adherence to Standard 2 [15]. In fact, more tests than the recommended Chest X-ray and sputum microscopy such as erythrocyte sedimentation rate (ESR), Mantoux test and urine test were advised by almost all practitioners [15]. In the study by Achanta et al, 34% doctors advised the patients for chest X-ray [14]. This perhaps means that only few doctors rightly suspected a correct diagnosis of TB. Upon receiving the results of a chest X-ray and sputum microbiological examinations, only 47% doctors were able to detect TB [14]. This is evidence that there is an over reliance on additional tests, such as ESR count and other serological tests in the culture of private practices. Achanta et al suggests that this maybe a direct impact of the mounting pressure on private doctors to deliver immediate results to the clients and hence, have had to resort to more prompt methods of investigation often not in line with current recommendations [14].

Surprisingly, there was least awareness or practice of prescribing the correct anti-TB regime (Standard 8). The study by Achanta et al explained that 79 different treatment regimens were prescribed by a total of 105 private doctors including different combinations of medications including streptomycin, isoniazid, rifampicin, pyrazinamide and ethambutol [14]. These prescribing practices can only be changed if doctors constantly keep abreast of newer standard diagnostics and the RNTCP guidelines. It is the responsibility of the district to ensure their physicians are up-to-date and adhering to the recommended guidelines [16]. This effort could be supplemented by establishing programmes that encourage private drug and diagnostic companies to market their products [16]. Although there are RNTCP led training workshops, attendance by private
practitioners were low. Satyanarayana et al identified six studies that noted, in comparison to the 73-92% government providers who attended formal RNTCP led training workshops on TB care, only 17-58% of private practitioners attended such education [7].

It is likely that this lack of awareness of appropriate investigations of TB is the reason for ‘dilemmas’ stated earlier in this review. The cases are not being appropriately identified (the ‘missing cases’ - Dilemma 2) and those that are left untreated as a result (Dilemma 1).

Two studies noted a greater than 50% adherence to Standard 9 [7, 15]. Findings suggested that overall private practitioners were more aware of Standard 9. However, although doctors are aware of these protocols, they are not always putting them to practise. One study found that private practitioners found TB notification too time consuming as they were unfamiliar with Nikshay [17]. Furthermore, practitioners were concerned about patient confidentiality through this system [17]. 7 of 10 studies in Satyanarayana et al reported that less than half of the providers used DOT or a supervised approach [7, 18]. Most of their TB patients received unsupervised treatment. But, the same study identified that 90% doctors were aware of this approach [7]. In 2017 only 19% of patients who received care from the private sector were reported to the RNTCP as compared with 81% from public sector [5].

67% of patients remained with the private sector while 34% shifted to the public sector for further treatment during the first 6 months of follow up [15]. The main reason that stood out for not availing government facilities for the treatment of tuberculosis was their dissatisfaction with the services (51.7%) [15, 19]. Secondly, about 18% of the individuals cited non-availability of government facilities in the neighbourhood as a reason for attending private practitioners [11]. Among the studies by Satyanarayana et al, eight studies provided comparisons between private and public sectors for each Standards 2, 8, 9 [7, 20-26]. Five studies reported that public sector providers were more likely to know that sputum smear examination is the primary test for TB (Standard 2) [7, 21, 22, 24, 27]. In all studies but one [25], adherence to all standards was found to be consistently higher in the public sector (P <0.05) [7]. Therefore, this study shows that the knowledge of TB among doctors of the public sector were superior to that of the private sector doctors [7, 10, 19, 25, 28-30].

Despite the apparent accelerating confidence in private practitioners, the above findings indicate that these doctors have a long way to go to be capable of adequately treating the condition. There appeared to be a vast variance amongst their practices in advising appropriate diagnostic tests and in correctly managing TB [31-34]. There seems to be a dearth of information when it comes to
providing patient-centred care; this pleads for a dire need of further educational input for private doctors in treating TB [31, 34].

This situation prompts the further study regarding the lapses in patient care in the private sector. As this discussion has been stating, there is much evidence shown in the studies that there is a very true lack of compliance in the technical as well as quality of care standards of TB patients [35, 36]. Both these aspects are critically paramount to the control of TB in India. Nevertheless, as seen above, patients seem to prefer this system of care in India, as opposed to the public sector; perhaps owing to a geographical advantage, much shorter waiting periods, confidentiality and the availability of doctors. Therefore it is imperative that these doctors are mandated to follow national guidelines regarding TB management and document their cases systematically to identify and solve ongoing issues amongst private clinicians.

There were some limitations to this literature review. The studies did not reiterate if the providers were ‘mutually exclusive’- it could be that doctors working in the government hospitals are also working nights or weekends in the private sector. In addition, it has to be taken into consideration that the studies were not wholly representative of how patients tackle their condition all across India. The analyses from most studies were mainly based on results from the urban population, thereby not giving an accurate representation of all regions of the country. The disparity between the qualities of patient centred care in rural centres versus urban centres needed to be assessed. Finally, it is difficult to say whether the lapses in diagnostics and treatment at the various centres are primarily due to patient load or health care facilities or an unidentified factor at the centres. This is not mentioned in the studies, making it impossible to come to a conclusion regarding this aspect.

Potential ‘publication bias’ was not investigated as the type of data used in this review could not be statistically tested. There were fewer studies focusing on the care provided by the public sector, despite the large patient load they treat, and much more studies on the care sought at the private sector.

From this literature review, it is understood that a proper patient centred approach of care by the private sector is not delivered despite this being the first choice of contact by majority of patients. Instead, patients are more prone to respond poorly to treatment, develop drug resistance and have poor adherence to treatment. The need for further research into the reason and solution for the lack of knowledge amongst physicians, the lack of implementation of standards and the large disparity between private sector approaches towards patient care is imperative.
It is beyond the scope of this literature review; however it would be worthwhile reviewing treatment for TB within alternate branches of medicine to understand whether better treatment is being provided. India has alternate branches of medicine such as homeopathy and Ayurveda, whom a large population of patients seek privately. The RNTCP, in their efforts to engage the private sector, do not recognise these practitioners [7]. However, upon scrutiny of data, it was found that doctors from these other paths of medicine, such as those trained in The Ministry of Ayurveda, Yoga, Unani, Siddha and Homeopathy (AYUSH), had better adherence to the diagnostic and treatment standards of TB than those doctors with medical and specialist degrees [7, 14]. This may be because AYUSH doctors have less extensive training in TB, therefore it is imperative that they have strict diagnostic and treatment standards [14]. In the study, 15% of the sample of providers constituted of AYUSH providers, thereby suggesting that these practices are important in India and should be realistically not neglected by the RNTCP [7].

CONCLUSION

TB is a chronic granulomatous disease caused by the bacteria *Mycobacterium Tuberculosis* complex. Most commonly it affects the lungs, and this is known as pulmonary TB. In 2011, the WHO estimated a global incidence of 9.6 million TB cases [1]. Of this, India was considered to be the highest TB burden country with an estimated incidence of 2.2 million cases out of the global incidence with about 150,000 to 350,000 deaths per year [2, 9]. Despite the government’s efforts to address the issues of expensive treatment and ‘missing cases’ by introducing RNTCP, TB is still on the rise and continues to be a burden. The aim of this systematic review is to analyse, in particular the awareness of private practitioners in diagnosing and treating TB. This is because majority of patients access the private health care in India. Results were reviewed against three standards identified by the WHO. These included diagnosis through sputum samples (Standard 2), management regimens of TB (Standard 8) and follow up specialist treatment (Standard 9). Overall, results suggested that there was less than 50% adherence against all three Standards. Only one study noted a greater than 50% adherence to Standard 2. Two studies noted a greater than 50% adherence to Standard 9 and there was least awareness or practice of prescribing the correct anti-TB regime (Standard 8). As patients have a lot of trust in private practitioners, this study recommends that it is essential that the private sector is educated about the RNTCP guidelines. Private practitioners are to be made aware of referring to RNTCP. They are required to be educated on the importance of being compliant to the appropriate diagnostic investigations, work on implementing them and reporting their cases systematically. This type of development goal by all health sectors in India would pave way for effective control of TB, thereby making TB a winnable battle for India.
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