

Catch them young: Knowledge gaps about drug resistant tuberculosis among Homoeopathy college interns: A pre and post-test study

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Abstract

Background: India is the highest Tuberculosis (TB) burden country in the world. It also has the second highest burden of Multidrug-resistant TB globally. Many precious lives are lost due to Drug-resistant TB (DR TB) every day. To achieve the goal of TB elimination in India, robust primary health care is mandatory. Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH) practitioners provide a quarter of primary health care in India. Since interns working at Homoeopathic Medical college will be the future primary care providers, their awareness about DR TB will help reach the target of End TB by 2025. **Objective:** The study objective was to assess the knowledge gained by Homoeopathy college interns in the diagnosis and treatment of DR TB following a single-day training session. **Materials and methods:** This cross-sectional study was carried out among 33 interns of Bharati Vidyapeeth (Deemed to be University) Homoeopathic Medical College, Pune. A questionnaire was given in the form of a pre-test before the training session. The training comprised the epidemiology of DR TB, its diagnosis, treatment, counseling, and need for referral. After completion of training, a post-test was given, and scores were calculated. A two-tailed paired sample t-test was used to assess gain in knowledge. The proportion of participants with correct responses for every question was determined and compared before and after training using the McNemar test. $P < 0.05$ was considered statistically significant. **Result:** The mean pre-test score was 2.30 ± 1.24 , while the mean post-test score was 4.24 ± 2.00 ($p < 0.001$). There was less knowledge about the regime for DR TB, pre-treatment evaluation, gene Xpert method, and empirical Anti-tuberculosis Treatment. **Conclusion:** This study highlights that there are significant gaps in knowledge about DR TB among Homoeopathy college interns. It also showed that a short training session significantly improved their knowledge.

Keywords

Tuberculosis, AYUSH, Homoeopathy, Drug-resistant TB (DR TB), National Tuberculosis Elimination Programme (NTEP)

Introduction

India has been scourged by tuberculosis (TB) since time immemorial. It is the country with the highest TB burden in the world, contributing to almost 30% of the global burden⁽¹⁾. In 2021, the incidence of TB in India was 210 per lakh population, while the mortality rate was 37 per lakh population⁽¹⁾. This mortality rate translates to almost two deaths every three minutes. TB cases have been divided into two groups, namely Drug-Sensitive TB (DS-TB) and Drug-resistant TB (DR TB), depending on susceptibility to first and second-line Anti-Tuberculosis Treatment (ATT). Among DR TB cases, the most common is Multi-Drug Resistant TB (MDR-TB). The number of MDR-TB cases in India is 9.1 per lakh population⁽²⁾.

Considering the high burden of disease in our country, it is imperative that there should be early diagnosis and early initiation of treatment to curb the spread of TB. According to a study in Mumbai, the average time from seeking health care to diagnosing TB is 42 days⁽³⁾. Physicians who form the first point of contact for patients, therefore, play a crucial role in

the goal of ending TB. A burgeoning private sector comprises the major chunk (75%) of Indian health care at the primary level⁽⁴⁾. Among the private sector, around a quarter (24%) is provided by non-MBBS doctors, including alternative medical practitioners with degrees in Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH) providers⁽⁵⁾. The factors responsible for this large contribution by AYUSH are low fees, easy accessibility, and clinics being open even after work hours⁽⁵⁾. In 2019, a landmark decision to integrate AYUSH into the National Tuberculosis Elimination Program (NTEP) was taken, wherein AYUSH practitioners would assist in the screening, diagnosis, contact tracing, monitoring of Adverse Drug Reaction (ADR), counseling of patients (regarding nutrition, de-addiction, and treatment adherence), follow-up and referral, when required⁽⁶⁾. As per NTEP-AYUSH guidelines, orientation and sensitization of final year undergraduate students, interns, post-graduate students, and faculty of AYUSH on TB prevention, diagnostics, and treatment has to be done through lectures, e-platform and Continued Medical

Education (CME) programs⁽⁶⁾. As of now, formal teaching of TB diagnosis and treatment is not a part of Homoeopathy college curriculum for undergraduates. AYUSH teaching colleges have been advised to conduct 15 day orientation program for all interns as per collaboration with NTEP⁽⁶⁾.

The longer it takes to diagnose TB and initiate treatment, the longer the patient is infected, causing a public health concern. Thus, early diagnosis and treatment is paramount to reduce the country's disease burden. If primary care physicians are armored with knowledge regarding TB, this goal becomes easier to achieve.

This study was conducted to assess basic knowledge about DR TB among interns working at Homoeopathy College and their capacity building in the form of training. Since interns will join the workforce as soon as they pass out, they will be the first point of contact for many TB patients. Thus, knowledge about DR TB, its prevention, diagnosis, treatment, and referral are important for the implementation of the TB elimination program at the grassroot level.

Materials and Methods

The sensitization program was conducted at Bharati Vidyapeeth (Deemed to be University) Homoeopathic Medical College in Pune, Maharashtra. The study was conducted over a period of one month in the year 2023. The time taken for preparation was two weeks; data collection was done in one day, and analysis was done over the next two weeks. The study site was the Homoeopathy College auditorium, where the sensitization program was conducted. The study intended to include all interns working at the Homoeopathy College. The inclusion criterion was the submission of completed pre and post-test questionnaires. The exclusion criteria were the lack of consent and failure to submit one or both questionnaires.

Training was provided by a senior chest physician and senior medical officers associated with NTEP. The training included the current epidemiology of TB in the country, diagnostic

modalities available; treatment including preventive tuberculosis treatment and adverse drug reactions of commonly used anti-tuberculosis drugs, as well as goals and achievements of the National Strategic Plan (NSP) 2017-2025 for Ending TB. The sessions were conducted over a period of four hours at the auditorium of the Homoeopathic Medical College in the form of PowerPoint presentations and interactive lectures by the faculty. Data was collected in the form of a questionnaire, which comprised 11 open-ended questions pertaining to knowledge about DR TB. Before the session, the questionnaire was given to the participants as a pre-test. The same questionnaire was given in the form of a post-test after completion of the training session.

Statistical analysis

Demographic data were presented in the form of percentages. Continuous data were presented as mean± Standard Deviation (SD). Each question was scored as 1 for correct and 0 for incorrect response. The overall score was calculated before and after training. IBM Statistical Package for Social Sciences (SPSS) Version 29.0, 2022 software was used for data analysis. The proportion of participants with correct responses for every question was determined and compared before and after training using the McNemar test. A two-tailed paired sample t-test was used to assess gain in knowledge. All statistical tests were two-sided at alpha=0.05.

Result

A total of 48 interns attended the training session. However, only 33 interns completed both the pre and post-test questionnaires and were included in the study. Amongst these, 76% were female and 24% were male. The age of all participants was ranging between 22 and 26 years. The mean pre-test score was 2.30±1.24 while the mean post-test score was 4.24±2.00 and this difference was statistically significant (p<0.001) (Table 1).

Table 1: Interns' mean scores of knowledge

	Mean (SD)	Mean Difference (SD)	95% CI	p-Value
Pre-test score	2.30 (1.24)	-1.93 (1.83)	-2.59 to -1.28	<0.001
Post-test score	4.24 (2.00)			

The majority (73%) of the participants had improvement in scores after the training session, while 21% had no change

(Table 2). Two participants had a reduction in score after training.

Table 2: Change in knowledge scores after training

Change in score	n (%)
Improvement in score	24 (73)
No change in score	7 (21)
Reduction in score	2 (6.1)

There was no significant difference in the improvement of scores among females versus males. Table 3 illustrates the

various TB knowledge statements assessed by the questionnaire and improvement after training.

Table 3: Results of interns' knowledge about TB before and after training

TB knowledge statements	Correct in pre-test	Correct in post-test	p-value
	Number (%)	Number (%)	
Universal DST	6 (18.2)	24 (72.7)	<0.001*
NSP 2017-2025	5 (15.2)	9 (27.3)	0.219
DR TB Regimen	0 (0)	7 (21.2)	0.016
Requirement for pretreatment evaluation	19 (57.6)	29 (87.9)	0.006
Pretreatment evaluation	0 (0)	5 (15.2)	0.063
ADR of DS-TB treatment	15 (45.5)	16 (48.5)	1.000
Duration of MDR TB Treatment	8 (24.2)	14 (42.4)	0.109
Pre-requisites for Gene Xpert	0 (0)	13 (39.4)	<0.001*
Empirical ATT	3 (9.1)	0 (0)	0.250
TB preventive treatment	7 (21.2)	9 (27.3)	0.727
Challenges faced by HCP	13 (39.4)	14 (42.4)	1.000

* p<0.05: significant

Abbreviations: DST: Drug Susceptibility Test, NSP: National Strategic Plan, TB: Tuberculosis, DR TB: Drug Resistant TB, ADR: Adverse Drug Reaction, DS-TB: Drug Sensitive TB,

MDR: Multidrug-resistant, ATT: Anti-tuberculosis Treatment, HCP: Health care Professionals.

Discussion

Although a lot has been achieved in the past, India still has a long way to go in its fight against TB. Since its implementation, the National Strategic Plan (NSP) 2017-2025 has set very optimistic goals of ending TB in the country by 2025. For Government programs to percolate to the level of primary healthcare there needs to be integration of services among all healthcare providers, including public and private sectors. A novel strategy was undertaken in Mumbai from 2014 to 2017 to engage private providers for the treatment of TB. The researchers reported an almost doubled TB notification rate and high treatment completion rate. This study had policy implications as it demonstrated that private providers can be effectively engaged in TB control in India⁽⁷⁾. A large proportion of India's private sector health care is provided by alternative medicine practitioners, broadly known as AYUSH⁽⁸⁾. Integration of AYUSH with NTEP has been a major decision because it ensures the detection of TB at the earliest by non-MBBS doctors practicing at the periphery.

In our study, we found a significant improvement in knowledge scores after the training of interns. Around three-quarters of participants had an improvement in score. This highlights the impact of training on healthcare providers.

Assuming that a small, one-day training program can improve knowledge significantly, it can be expected that a structured program aimed towards capacity building will have a major impact on the knowledge of TB among primary care physicians⁽⁹⁾. This improved awareness will account for increased early case detection, ultimately bringing us closer to the goal of ending TB by 2025. The lack of improvement in scores of 21% of participants and reduction in the score of two participants may be attributable to various factors like difficulty in understanding complex concepts in a single session, not attending all sessions by these participants, or the presence of any other distractions at the time when the relevant concept was being covered. The basic knowledge in the interns was Poor. Based on Table 3, focus areas where there is a lacuna in knowledge among interns can be interpreted. There is less knowledge about the regime for DR TB, pre-treatment evaluation, gene Xpert method, and empirical ATT. This tells us that further training modules need to incorporate these topics in detail. Also, this sensitization session needs to be followed by a structured, longer-duration training program so that knowledge gained during this training session can be consolidated. This also emphasizes the need for a more interesting and engaging curriculum and teaching methods in this structured program. Soon after passing out, these interns are going to be the

primary point of care at the grassroots level. They should be armored with basic knowledge about the diagnosis and treatment of TB, as well as counseling about adherence to treatment and referral so that delay in diagnosis can be reduced. For implementation of NTEP policies, similar training sessions are a must at all Homoeopathy medical colleges.

The shortcoming of this study was the small sample size, so the data cannot be representative of the community.

Conclusion

In our study, we found significant gaps in knowledge about DR TB among the participants. So, in the orientation program being planned by the NTEP-AYUSH collaborative group, the focus area should be suspicion, diagnosis, and treatment of DR TB. Our study showed that a short training session significantly improved the knowledge about DR TB among Homoeopathy interns. It highlights the importance and need of training in a structured, longer-duration format towards increasing knowledge among physicians practicing alternative medicine.

Recommendations

Homoeopathy college interns are not posted routinely in TB/DR TB clinics during their internship. A 15-day rotation posting in such clinics will enhance their knowledge with its application in clinical practice. Also, keeping in line with the NTEP-AYUSH guidelines, all Homoeopathy colleges should compulsorily conduct a 15-day orientation program for interns.


NTEP should be a part of academic curriculum for AYUSH disciplines and interns should have a basic understanding of the epidemiology, clinical presentation, diagnostic modalities, and treatment of both DS and DR TB. This is a promising approach to preparing primary care physicians for the goal of ending TB in India.

Conflict of Interest: Nil

Source of Support: Nil

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Ethical consideration

Institutional Ethics Committee was obtained. Written informed consent was taken from the interns.

Authors' Contribution

PC: Design, data collection, implementation, data analysis, interpretation; AS: Conceptualization, design, data collection, implementation, data analysis, interpretation, and manuscript writing.

Data availability statement

Data will be available with corresponding author on request.

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