Original Research Article

Knowledge, attitude and preventive practices regarding tuberculosis care and control among health care professionals at TB centres: implications for TB control efforts

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ABSTRACT

Background: Tuberculosis (TB) ranks as the leading cause of death from infectious disease. The World Health Organization (WHO) has considered TB a global public health disaster since 1993. Four factors affect non-adherence to treatment-the patient, healthcare systems, pharmaco-therapeutics and the key persons, health care professional (HCP). So, the study was conducted to evaluate knowledge, attitudes and practices regarding TB care and control in HCPs working in TB units.
Methods: This was a cross-sectional, observational, questionnaire-based study conducted in all the HCPs working for the TB care and control.
Results: The responses to the questions of knowledge were variable indicating incompleteness of information, facts, understanding related to TB in HCPs. HCPs show very strong positive attitude for finding every new case of TB is essential. The HCPs disagree to some statements like traditional or alternative medicine assists in wellbeing of TB patients. Practice competency was low with average score 2.32 out of 6, doctors having higher score of 4.62 followed by nurses, lab-technicians, pharmacist and activist with score of 2.57, 1.66, 1.5, 1.25 respectively. The activist are the key persons in the national tuberculosis program, exhibited the least score in this study indicates they do not have much orientation about the practice of TB treatment. Specific deficiencies existed for some knowledge statements of HCWs on TB. There was disagreement in attitudes regarding stigma and traditional medicine, and practice competencies were poor. Improvement in aspect of KAP of HCPs on TB will help India achieve the goal of End TB.
Conclusions: Specific deficiencies existed for some knowledge statements of TB in paramedical staff as compared to doctor participants. There was disagreement in attitudes regarding stigma and traditional medicine, and practice competencies were poor in activists. Improvement in knowledge, attitude and practices of TB in paramedical staff by conducting CME, Workshop, training sessions will help India to achieve the goal of End TB.

Keywords: National tuberculosis program, Questionaire based study, Tuberculosis, DOTS, RNTCP

INTRODUCTION

Tuberculosis (TB) ranks as the leading cause of death from infectious disease. The World Health Organization

(WHO) has considered TB a global public health disaster since 1993. The six components of the stop TB strategy, the global strategy and targets for TB prevention, care and control as approved by WHO are pursue high-quality

directly observed treatment, short-course (DOTS) expansion and enhancement, address TB/HIV, multi-drug-resistant (MDR) TB and other special challenges, contribute to health system strengthening, engage all care providers, empower people with tuberculosis, and communities and enable and promote research.[1]

Following a wide consultation process, WHO defined three new high burden countries (HBC) lists for the period 2016–2020: one for TB, one for MDR-TB and one for TB/HIV. India is featuring on top in the list of 22 high-burden countries in category of TB.[2]

Directly observed therapy (DOT) has now become the accepted standard for TB treatment throughout the world, and has been applied in India. India adopted directly observed treatment - short course (DOTS) under the revised national tuberculosis control program (RNTCP) in 1992 and public - private mix DOTS in 2002. A standard DOT program involves the administration of TB antibiotics to patients under the direct observation of health program staff.

Four factors affect non-adherence to treatment--the patient, healthcare systems, pharmaco-therapeutics and health care professional (HCP).[3] Kigozi et al in their study suggested that the health care professional failed in delivering adequate TB care have aggravated TB control challenges. For instance, drug-resistant forms of TB have risen largely as a result of late detection, poor treatment and management, and failure to retain TB patients on treatment.[4] In a study by Minnery et al it has been reported that the HCPs have proven to be successful components of MDR-TB treatment in some parts of world.[5] TB control is more likely to be achieved if the level of knowledge regarding TB is increased among the HCPs managing high-risk groups. HCPs need to be adequately educated and trained in order to effectively treat TB. The study by Noé provided motivation for specifically designed TB education among health care workers from a high TB burden rural area in Southern Mozambique.[6] On the contrary some research with TB health personnel in other countries has recognized that these key persons often lack knowledge about TB and infection control, which contributes to an increased risk of they themselves getting infected by TB.[7] It is important to note that inefficient case-finding is an important obstacle to successful control of TB. Patients who are involved in several different health care encounters may account for delayed case-finding. Certain reports also suggest that improved interpersonal skills of health centre staff and coordination between private doctors and health centers may substantially improve services for TB patients.[8]

The WHO has estimated that, of the five main obstacles to the expansion of DOT and the successful development of local and national programs, four are directly human resource related. As such if human resources are scarce or under developed the diagnosis and appropriate management of patients with TB and their contacts will be weakened.

For this reason, it is necessary to conduct assessments of the knowledge and attitudes about TB amongst front-line health personnel in charge of TB care, in order to identify potential problems, limitations and areas for improvement. Front-line TB health personnel in this context can be defined as health personnel who form the primary contact point amongst the community for accessing the national TB control program. They may include medical doctors, nurses, nurse technicians, health care workers and other allied health personnel. For this study we broadened this term to include laboratory staff, given their integral role in primary TB services.

Assessing the knowledge, attitude and practices of front-line TB health employees working in the National TB control program is mandatory to determine knowledge gaps in key areas relating to tuberculosis control and prevention. With greater understanding of the gaps which face these two areas of TB control it may be possible to contribute to strengthening the National TB control program.

The study was carried out to determine the level of knowledge, identify attitudes and assess preventive practices regarding TB care and control among HCPs in TB units.

METHODS

Study area

This was a cross-sectional, observational, questionnaire-based study conducted in front-line health personnel in charge of TB care. The study was carried out in a District Tuberculosis Center (DTC) of a tribal district in eastern Maharashtra, India. In this district there is one tertiary care teaching institute attached with one district hospital and 42 primary health care centers (PHCs).The data was collected from the different PHCs and DTC over three months period from April-June 2019.

Selection criterion

The study was conducted in 114 front-line health personnel in charge of TB care which included treating doctors (medical officers having first degree qualification and higher qualification), lab technicians, activists, nurses, dispensing pharmacists. For the study only medical staff is included and as administration and support staff are not supposed to provide health education therefore they are excluded from the study.

Designing of the questionnaire and data collection

A questionnaire was developed to obtain information on the knowledge attitude, practices of tuberculosis, RNTCP

and DOTS using the a set of relevant questions from previous published similar studies.[6] Content validity was assessed by distributing the questionnaire to 10 health care professionals recruited to complete the validation process. The final form of the questionnaire consisted of healthcare professionals demographic data, and a total of 41 open and closed ended questions that can assess respondents knowledge attitude and practices towards tuberculosis, RNTCP and DOTS. In the last the participants were asked for suggestions /remarks, if any. For the participants who were not well versed with English, a vernacular version validated form of the questionnaire was made available for them. After due permission from DTC, the study was conducted in an interview format as a standard, but self-administered if the HCW repeatedly (more than two times) reported they had insufficient time for an interview. The questionnaire took 15 to 20 minutes to administer with no external assistance.

The knowledge section contained 24 questions and was sub-divided into sections: prevention, transmission, diagnosis and treatment of TB. Responses were established as correct or incorrect. If a question was left unanswered, the question was marked as incorrect. The attitudes section posed 12 questions encompassing the subjects of quality of education of HCWs, community awareness, access and barriers to the NTP (National Tuberculosis Program), resources devoted to the NTP, treatment adherence and local TB control program priorities. The responses to these questions were obtained using a 5-point likert scale and were collapsed into agreement, neutral or disagreement for analysis.

Responses to attitude questions were obtained as strongly agree, agree, neutral, disagree and strongly disagree. Practices were not directly observed, rather one common practice scenario was presented and questions were asked on basis of the present case regarding the management. The responses are analyzed on the basis of the possible answers.

Ethical consideration

Study was approved by institutional ethics committee (Reg no.ECR /1033 /Inst / MH2018) and written informed consent was obtained from each participant before enrolment. A total of 103 health care professional meeting the inclusion and exclusion criteria were enrolled in the study.

Data treatment and analysis

All the questionnaires were identified by instituting an identification number and the questions were coded. The filled questionnaires were analyzed as per the objectives of the study based on the professional differentiations. The data entered into an electronic database using the MS Excel 2010. Data was export from completed questionnaires and prepared for analysis. Answers were scored and means and percentages were treated as continuous variables.

RESULTS

Out of 114 health care workers (HCWs), 103 HCWs participated in the study, giving response rate of 90%. The most common reason for refusal was a lack of time to participate in the study. 56.31 per cent of respondents were women with doctors and activist being the most common profession taking part (28.15% and 27.18%, respectively). 29.12% percent of respondents reported never having had TB-specific training.

Knowledge

In the knowledge section we had designed 24 questions. The average knowledge score was 18.48 points out of a total possible score of 24 points. Socio-demographic characteristics and service-related variables of the study participants were explained in Table 1. Respondents Knowledge of TB and its profession wise relationship is explained in Table 2 and 3 respectively. Table 4 shows the variable responses (in percentage) of HCPs to knowledge related questions of TB.

Table 1: Socio-demographic characteristics and service related variables of the study participants (n=103).

Characteristic	N (%)
Age (in years)	
<40	66 (64.66)
>40	37 (35.92)
Gender	
Male	45 (43.68)
Female	58 (56.31)
Job category	
Doctors	29 (28.15)
Lab-technician	15 (14.56)
Nurse	21 (20.38)
Pharmacist	10 (09.70)
Activist	28 (27.18)

Continued.

Characteristic	N (%)
Duration of work (years)	
<1	12 (11.65)
1-5	24 (23.30)
<10	25 (24.27)
>10	42 (40.77)
Received infection control training?	
Yes	73 (70.87)
No	30 (29.12)
Direct involvement in TB control activities?	
Yes	99 (96.11)
No	04 (03.88)

Table 2: Resident's knowledge of TB (n=103).

Question /statement related to TB	Correct responses (N)	%
What is the causative agent of TB?	97	94.17
Is TB a transmissible disease?	103	100
How does TB spread?	97	94.17
Higher risk of developing TB is with patients of?	49	47.57
The likelihood they will develop active TB?	57	55.33
What preventive measures can you take as HCP?	64	62.13
Signs of pulmonary TB?	40	38.83
Diagnostic tool for TB?	93	90.29
Is diagnosis in children more difficult than in adults?	86	83.49
Number of sputum samples necessary for diagnosis?	79	76.69
Sputum sample should be taken?	80	77.66
How should sputum sample be stored?	70	67.96
Is tuberculosis a curable disease?	101	98.05
How long is the first line treatment of pulmonary TB?	93	90.29
Does tuberculosis treatment in children have a longer period?	31	30.09
How many drugs are used in the first line treatment of tuberculosis?	78	75.72
Do you know what is DOTS?	103	100
Do you know what is MDR TB?	89	86.4
In which population is MDR TB most likely to occur?	57	55.33
When should the first follow up sputum sample be carried out following the commencement of treatment of a confirmed case of TB?	79	76.69
The major element to assess TB T/t cure?	45	43.68
The consequences of incomplete T/t?	30	29.12
Is there a vaccine for TB?	85	82.52
Time for BCG vaccination?	103	100

The attitude of respondents is shown in Table 5. More than half (63.10%) of the patients strongly agreed that TB is a life threatening disease in India of the HCPs strongly agreed to and suggested that finding every new case of TB is essential for control of the disease. Nearly sixty (59.22%) percent of the respondents said that there is a substantial increase in treatment completion rates if DOTS is used. But only 42.71% HCPs strongly agreed to that public awareness regarding TB as a health problem in India is adequate. Only 17.47% respondent said that

traditional or alternative medicine assists in wellbeing of TB patients. 29.12% respondents strongly agreed and said that the first line therapies for TB are accepted by patients.

About one third 26.21% HCPs were uncertain whether the lab service at their health centre is adequate for the diagnosis of TB. (75.72%) HCPs strongly suggested that teaching TB patients regarding cough hygiene is important. 80.58% respondents said that Infection control is an important means to prevent transmission of TB.

78.69% HCPs were uncertain about the working capacities of the patients after infected by the TB. HCPs found the association between HIV and TB.

Table 3: Knowledge score of respondents according to their profession.

Profession	Score (mean±SD)
Doctor	18.86±2.62
Nurse	18.57±1.93
Activist	17.47±2.65
Lab technician	18.06±2.18
Pharmacist	16.8±2.65

Practice

There was a total of 6 questions in the practice assessment part of the questionnaire dealing with the differential diagnosis treatment duration and drugs used in the treatment in a given case scenario. Every right answer was given +1 while a wrong answer was not awarded any marks. The average score of all the 103 cases was found to be 2.55.

The scores were analyzed for each profession (Table 6). Doctors had the highest average score of 4.62 followed by nurses, lab technicians, pharmacist and activist with score of 2.57, 1.66, 1.5, 1.25 respectively.

The score clearly showed that the activist involved in the National TB Eradication Program, who motivate the patients for taking and completing the course of TB do not have much orientation about the practice of TB treatment. On the other hand, since the doctors are directly treating the patients are much more aware about the treatment advances and diagnostic techniques.

The duration of work showed a different result of what was expected. We expected that greater the duration more will be the awareness but to our surprise, the health care professionals who were employed for less than 1 year had highest average score of 3.25 followed by health care professionals employed for 1-5 years, more than 10 years and then 5-10 years with an average score of 3.125, 2.35 and 2 respectively (Table 7). It is important that the health care professionals should receive regular training regarding sample collection, sample storing conditions, newer techniques of diagnosis and treatment guidelines. The results of our study showed that health care professionals who received training and who did not receive training had average score of 2.60 and 2.43 respectively (Table 8).

Table 4: Variable responses (in percentage) of HCPs to knowledge related questions of TB.

>90%	70%-90%	50%-70%	<50%
What is the causative agent of TB?	Is diagnosis in children more difficult than in adults?	What preventive measures can you take as HCP?	Higher risk of developing TB is with patients of?
Is TB a transmissible disease?	Number of sputum samples necessary for diagnosis?	How should sputum sample be stored?	Signs of pulmonary TB?
How does TB spread?	How many drugs are used in the first line treatment of tuberculosis?	In which population is MDR TB most likely to occur?	Does tuberculosis treatment in children have a longer Period?
Diagnostic tool for TB?	Do you know what is MDR TB?		The consequences of incomplete T/t?
Is tuberculosis a curable disease?	When should the first follow up sputum sample be carried out following the commencement of treatment of a confirmed case of TB?		
How long is the first line treatment of pulmonary TB?	Is there a vaccine for TB?		
Do you know what is DOTS?			
Time for BCG vaccination?			

Table 5: Attitude of HCPs towards TB treatment and care (n=103).

Question/statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Not answered
Finding every new case of TB is essential for control of the disease.	90	11	1	0	1	0
There is a substantial increase in treatment completion rates if DOTS is used	61	33	1	5	1	2

Continued.

Question/statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Not answered
Public awareness regarding TB as a health problem in India is adequate	44	27	9	19	2	2
MDR TB is life threatening problem in India	65	24	5	2	4	3
Traditional or alterative medicine assists in wellbeing of TB patients	18	17	17	24	21	6
The first line therapies for TB are accepted by patients	30	63	3	4	2	1
The lab service at my health centre is adequate for the diagnosis of TB	34	42	13	6	7	1
Teaching TB patients regarding cough hygiene is important	78	23	0	1	0	1
Infection control is an important means to prevent transmission of TB	83	19	1	0	0	0
I should know my status of TB (whether I've or had TB	60	17	22	1	1	2
If I got infected with TB, I should be allowed to continue working with my current capacity	24	42	9	21	5	2
There is an association between HIV and TB	68	28	4	0	0	3

Table 6: Profession wise score of practices in HCPs (n=103).

Profession	Average score (total=6)
Doctor	4.62±1.2653
Activist	1.25±1.265643
Lab-technician	1.66±2.126925
Nurse	2.57±1.912366
Pharmacist	1.50±1.715938

Practice average=2.32

Table 7: Score of practices in HCPs according to their working duration (n=103).

Working since	Average score (total=6)
Less than 1 year	3.25
01-5	3.125
05-10	2
More than 10 years	2.35

Table 8: Comparison of score of practices in HCPs with respect to the training (n=103).

HCPs (training received/not received)	Average score (total=6)
Received training	2.60±2.152129
No training	2.43±1.95965

DISCUSSION

The present study was carried out to determine the knowledge, attitude and preventive practices of TB in the first line health workers working in TB units. The responses to knowledge questions of TB was variable with well understanding and excellent positive response (>90%) to some like transmission of TB, DOTS, BCG vaccination, diagnostic tool, the length of first line treatment of pulmonary TB.

The responses to some knowledge questions was fair (50%-90%) like preventive measures to be taken, number of sputum samples necessary for diagnosis, storing of samples, number of drugs used in the first line treatment of TB, MDR TB, the time when the first follow up sputum sample be carried out following the commencement of treatment of confirmed case of TB.

However the knowledge level was very poor (<40%) and specific deficiencies existed for some statements like Understanding the risk factors for development of TB, signs of TB, the consequences of incomplete treatment, treatment of TB in children.

These findings were consistent with findings from some studies.[9-12] But in some studies from larger African centers contrast findings were reported.[13-15] In the present study the respondents had poorest knowledge regarding consequences of incomplete treatment and pediatric TB, the diagnostic differences between children and adults. Both these domains are core competency for the HCPs of TB units. If they are updated regarding this issue it will help to overcome important barriers in control of TB in both adult and pediatric population.

While studying the responses to attitude questions in the participants, it was noticed that the study population strongly agreed with the finding every new case of TB is

essential for control of the disease, teaching TB patients regarding cough hygiene is important and infection control is an important means to prevent transmission of TB, there is an association between HIV and TB, MDR TB is life threatening problem in India.

The respondents disagree to some statements like traditional or alternative medicine assists in wellbeing of TB patients, the first line therapies for TB are accepted by patients.

The existence of these attitudes in health workers will definitely help in proper guidance and counseling of patients which is as important as treatment of the disease.

In the current study, a total of 6 questions were asked in practice section. This assessment part of the questionnaire dealt with the differential diagnosis treatment duration and drugs used in the treatment in a given case scenario. Every right answer was given +1 while a wrong answer was not awarded any marks. The average score of all the 103 cases was found to be 2.55. The scores were analyzed for each profession. Doctors had the highest average score of 4.62 followed by nurses, lab technicians, pharmacist and activist with score of 2.57, 1.66, 1.5, 1.25 respectively. The average practice score in our study is 2.32 The score clearly showed that the activist involved in the National TB Eradication Program, who motivate the patients for taking and completing the course of TB do not have much orientation about the practice of TB treatment. On the other hand since the doctors are directly treating the patients are much more aware about the treatment advances and diagnostic techniques. In a study by Noé et al carried out in health workers of Southern Mozambique practice competency was low with the average practice score being 3.2 points out of 9 (35.6%, SD =2.44).[6] Chakaya et al. assessed practice competency in HCWs with comparable methods, finding similar deficiencies in the initial investigation of TB suspects as well as an unfamiliarity with anti-TB drugs and regimens.[11]

Assessment of the practice score in relation to the duration of work of HCPs in TB units showed a different result of what was expected. We expected that greater the duration of work more will be the awareness but it was not so, the health personnel who were employed for less than 1 year had highest average score of 3.25 followed by the ones, employed for 1-5 years, more than 10 years and then 5-10 years with an average score of 3.125, 2.35 and 2 respectively. In another study reported in literature as expected, the practice scores were directly related to duration of service of health professionals.

Those that had never worked with TB patients had lower practice scores than those that had been working with the patients for less than one year and between one and five years.[15] The unexpected finding in our study may be because in government set ups the employees work more

sincerely in the beginning of career and over the time they may not do so. Continuous monitoring by record keeping of assignments and activities of HCPs in each TB unit can help to upgrade and maintain the working pattern of HCPs.

CONCLUSION

In the present study specific deficiencies existed for some knowledge statements of HCWs on TB like understanding the risk factors for development of TB, knowledge of signs of TB, the consequences of incomplete treatment, treatment of TB in children.

There was disagreement in attitudes regarding stigma and traditional or alternative medicine, and practice competencies were poor. Health professionals still are in need of continuing educational programs regarding treatment and control of TB. RNTCP sensitization program needs to be undertaken among nursing and other paramedical staff in each and every hospital on a mass scale. The knowledge about the social stigma should be imparted to the paramedical staff as they play a major role in the counselling of tuberculosis patients. Improvement in knowledge, attitudes and practices of HCWs on TB will thus contribute to effective TB control and in the long term, will help India achieve the goal of End TB.

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