

## Original Research Article

# Impact of educational intervention on the tuberculosis knowledge among the medical students, Chennai

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## ABSTRACT

**Background:** Knowledge of tuberculosis has recognized as important tool to prevent the occupational risk of contracting tuberculosis among the medical students. Though tuberculosis health education has been recognized in the medical college's curriculum, the studies suggest the lack of knowledge of this killer disease among the medical students. This study was conducted with objective to assess level of knowledge of tuberculosis among the medical students and impact of education intervention on their knowledge.

**Methods:** A quasi experimental study was conducted in a tertiary care teaching hospital, Chennai from January to March 2019 with a sample size of 119. The participants were assessed using a pre-tested, semi-structured questionnaire. An educational intervention was given through audio visual aid and post-test was conducted after one month. The median scores were calculated and Wilcoxon signed ranks test was applied.

**Results:** Among the study participants, the mean age was 20.32±0.7 years. There was a significant improvement in the adequate knowledge of etiology, risk factors, clinical features and treatment following health education intervention. The post-test median score was statistically significant in all the domains of knowledge.

**Conclusions:** The study showed poor existing knowledge of tuberculosis among the medical students which improved with an educational intervention which implies a need to revamp the undergraduate curriculum to improve the knowledge and practices among medical students.

**Keywords:** Educational intervention, Medical curriculum, Medical students, Tuberculosis

## INTRODUCTION

Tuberculosis remains as one of the major infectious diseases globally. Though the causative organism for Tuberculosis was discovered nearly 10 decades ago, it still remains a major public problem.<sup>1</sup> According to the Global Tuberculosis Report of 2017, nearly 6.7 million people were notified.<sup>2</sup> The High-income countries reported only less than 10 new cases per lakh population, whereas the low- and middle-income countries reported nearly 150-400 cases per lakh population. According to

WHO, nearly 1.674 million died from tuberculosis in 2016. It was also reported that one fourth of the Tuberculosis incident cases are from India. It was shown that in 2016, India, China and Indonesia accounts for 45% of global tuberculosis cases.<sup>1</sup> The World Health Organization has implemented newer strategy- END TB strategy with the target to reduce Tuberculosis mortality by 95%, to cut down the incident cases by 90% between 2015 and 2035 and to end the global Tuberculosis epidemic.<sup>3</sup> Centre for disease control and prevention published a revised guideline for the prevention of

transmission of Tuberculosis infection in health care facilities in 2005.<sup>4,5</sup> In 1998, WHO has specified recommendations, knowledge, attitude and skills for a doctor to handle Tuberculosis cases.<sup>6</sup> According to a study conducted in Pune, there is a 15-fold higher estimated incidence of tuberculosis among the medical trainees than in the community.<sup>7</sup> There is a drastic public health consequence of active TB in the medical trainees. They can transmit the infection secondarily to their peers, patients and family members. A knowledge lack among the medical students may contribute to the increased risk of development of diseases.<sup>8</sup> Knowledge of Tuberculosis among the medical students should be important, as they have the higher risk of significant exposures and thereby higher risk of infection.<sup>9</sup> Being a future physician, they should be aware of the determinants, epidemiology, diagnosis and management of Tuberculosis.<sup>10</sup> But studies have reported that knowledge of tuberculosis among the medical students is not sufficient.<sup>11-13</sup> With this background the study was conducted with an objective to assess the level of knowledge of Tuberculosis among the medical students and also to assess the impact of education intervention on their knowledge.

## METHODS

### *Study design and setting*

A quasi-experimental study was conducted in a tertiary care teaching hospital, in Kancheepuram district, Tamil Nadu. The study was done for a period of 3 months (January to March 2019).

### *Study population*

Third year medical school students in a tertiary care teaching hospital were included in the study. Students of both gender and more than 18 years of age and willing to participate in the study were included.

### *Sample size calculation*

Sample size calculation was done using the formula,  $N = (Z_{\alpha} + Z_{\beta})^2 / (E/S)^2$ , with assumption of minimal effect size (E) = 0.5, SD of change in outcome (S) = 1.91,  $Z_{\alpha} = 1.96$ ,  $Z_{\beta} = 0.842$  and 80% power and 0.05  $\alpha$  error, the calculated sample size was 119. In the present study a total of 119 participants were included.

### *Study tool*

All the participants were given a pre-tested, semi-structured questionnaire. The questionnaire had 5 sections. Section 1 was about the basic information on Tuberculosis, Section 2 contains questions to test the knowledge on aetiology, risk factors and features of

tuberculosis, section 3 was about diagnosis, Section 4 on treatment and section 5 was on health program guidelines. Assessment of the adequate knowledge was done by assigning scores to each section. A correct knowledge of more than 80% in each domain was considered to be adequate.

### *Intervention*

Before the educational intervention, students were administered the study tool for the collection of pretesting information. The educational intervention was given for one hour using the lecture method with the help of audio-visual aids such as powerpoint presentation and videos. After 1-month, same study tool was used to collect the post test data.

### *Statistical analysis*

Data was entered in Microsoft excel Spread Sheet and after checking the normality, the data was analysed using Statistical Package for Social Sciences version 22. (IBM-SPSS v.22.0) Descriptive statistics was presented as percentages and inferential statistics was analysed with Mc Nemar test and Wilcoxon Signed Rank test. A p value of <0.05 was considered to be significant.

### *Ethical considerations*

Study was conducted after getting institutional ethical committee clearance. Written informed consent was obtained prior to the start of the study.

## RESULTS

A total of 119 participants were included in the study. The mean age of the participants was 20.32±0.7 years. Majority of the participants were females (61.3%) and 38.7% were males. Adequate knowledge for basic information on tuberculosis, aetiology and risk factors, diagnosis, treatment and program guidelines were 47.9%, 8.4%, 49.6%, 5% and 5% respectively before the intervention. Percentage of adequate knowledge was improved significantly for the basic information on tuberculosis, aetiology, Treatment and Program guidelines which was 73.9%, 40.3%, 31.9% and 42% respectively (Table 1).

### *Scores*

Each domain had a maximum score of 7. There was a significant improvement in the median scores in all the domains after the intervention (Table 2).

The total median pre-test score was 17 and it was improved to total median post-test score of 23 (Figure 1).

**Table 1: Comparison of adequate knowledge of the study participants before and after intervention (n=119).**

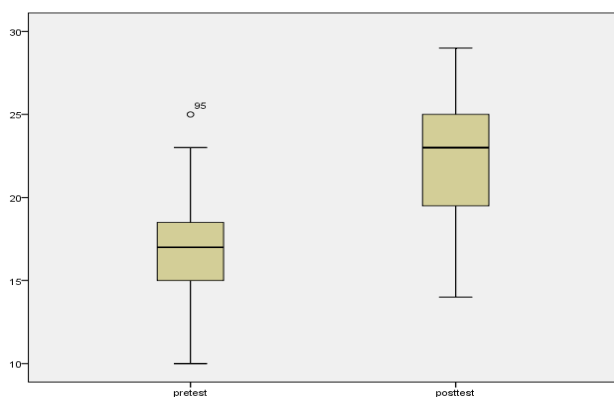
Domain	Knowledge adequacy	Pre test N (%)	Post test N (%)	P value*
Tuberculosis basic information	Adequate	57 (47.9)	88 (73.9)	0.000
	Inadequate	62 (52.1)	31 (26.1)	
Etiology, risk factors, features	Adequate	10 (8.4)	48 (40.3)	0.000
	Inadequate	109 (91.6)	71 (59.7)	
Diagnosis	Adequate	59 (49.6)	73 (61.3)	0.088
	Inadequate	60 (50.4)	46 (38.7)	
Treatment	Adequate	6 (5)	38 (31.9)	0.000
	Inadequate	113 (95)	81 (68.1)	
Program guideline	Adequate	6 (5)	50 (42)	0.000
	Inadequate	113 (95)	69 (58)	

\*Mc Nemar’s test was used.

**Table 2: Comparison of the pre-test and post-test scores of tuberculosis domains among the medical students (n=119).**

Domains	Pre-test score median (IQR)	Post-test median (IQR)	Wilcoxon Z score	P value*
Tuberculosis basic information	4 (4-5)	5 (4-6)	-3.87	0.000
Etiology, risk factors, features	3 (2-4)	4 (4-5)	-7.53	0.000
Diagnosis	4 (2-5)	5 (3-6)	-3.59	0.000
Treatment	3 (2-3)	4 (3-5)	-6.42	0.000
Program guidelines	3 (2-3)	4 (4-5)	-7.53	0.000

\*Wilcoxon signed ranks test.



**Figure 1: Comparison of pre-test and post-test total scores of the study participants (n=119).**

## DISCUSSION

The present study was conducted among medical undergraduate students which included 119 study participants of tertiary care teaching hospitals. The mean age of the study participants was 20.32±0.7 years in which majority were females (61.3%). Similarly, Montagna et al showed the mean age 22.5±3.7 years and majority included female participants.<sup>9</sup> Ou et al showed a significant results in which increase in the age acquired more knowledge regarding epidemiology, prevention than treatment.<sup>1</sup> The adequate knowledge about basic information of tuberculosis, etiology, risk factors and

clinical features which radically increased followed educational intervention which was found significant in the current study. Similarly Panalingan et al showed improved in the basic knowledge of tuberculosis among study participants from 65.22% to 86.83% which was statistically significant (p<0.001) following a health education intervention.<sup>14</sup> Thilakavathi et al study in rural south India showed the impact of health education intervention improved adequate knowledge about tuberculosis from 18% to 58%.<sup>15</sup> The above results strongly suggest that a clear health education on tuberculosis with audio-visual aid can significantly improve the current basic knowledge in any study settings.

In the current study, the post-test median scores of basic information on tuberculosis, etiology, risk factors, clinical features, diagnosis, treatment and program guidelines was high when compared to pre-test median scores which was found statistically significant. The most significant change in score was found in basic knowledge of tuberculosis and treatment aspects. Similarly, a study in Vellore showed improvement of mean score from 7.05 (64%) to 9.15 (83.2%) in pre and post-test respectively and the significant change in score was found higher for treatment domain.<sup>16</sup> The result suggests that educating and improving the knowledge of a priority diseases among the medical students, can disseminate this knowledge among their patients, paramedical workers and their family members. It is evident from the study

conducted by Bhole et al where health education intervention about leprosy among the study participants shows significantly high knowledge acquisition among their parents and among them 18.4% of parents reported their children were the source of information.<sup>17</sup>

There is a common fallacy that medical students have less risk of development of tuberculosis because of their better health and socio-economic status when compared to general population. In developing countries like India, the incidence of pulmonary tuberculosis is highly associated with occupational exposures when compared to developed countries.<sup>2</sup> The results of current study showed there is lack of knowledge of tuberculosis among the medical students and the need of health education interventional module to prevent and control of tuberculosis in the work place and community.

## CONCLUSION

The present study showed a knowledge gap in tuberculosis and which improved significantly with the health education intervention. Though the RNTCP has been widely accepted and India is on the way to achieve the global target of tuberculosis, the knowledge of tuberculosis among the medical students was found to have lacunae. Revamping the existing medical education, in which medical students should undergo mandatory postings in DOTS clinic during their each academic years and practicing the various aspects of RNTCP would improve the knowledge and has a direct impact on patient management and prevention and control of tuberculosis at the community level.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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