

Can Students Learn from Their Co-Students About Tuberculosis? Outcomes from Student-Friendly Quasi-Experimental Intervention Study in India

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Abstract

Background: The World Health Organization's "End TB Strategy" aims to end global tuberculosis (TB) epidemic through a holistic combination of health and social interventions placing the patients and communities at the heart of the response. This study aimed to assess the effectiveness of utilizing school children as ambassadors in TB advocacy. **Materials and Methods:** We adopted a quasi-experimental intervention design where students' awareness level was assessed before and after the intervention. A total of 185 student ambassadors were trained to conduct interventions in schools, and 920 students were randomly selected to assess the impact of the ambassador's intervention. A structured questionnaire was used to assess the correct and incorrect knowledge on specific aspects of TB. This intervention study was implemented in a phased manner which involved a participatory formative phase. A student-friendly and culturally relevant educational materials and activities for providing TB knowledge for the study student population were developed. Data collected from the baseline and end-line evaluation surveys were analyzed using STAT Ver. 16.0.– Stata Corp., June 2016, USA. **Results:** A significant increase (>80%; $P < 0.05$) in the correct knowledge on diagnosis and prevention for TB was noted among sampled students ($n = 818$) before and after intervention. Reduction in incorrect knowledge, like understanding TB as hereditary disease, was found to be less (50%; $P < 0.05$). **Conclusions:** School students lead intervention could significantly improve correct knowledge on TB and could be replicated.

Keywords: Advocacy, awareness, control, intervention, students, tuberculosis

INTRODUCTION

School health interventions are considered helpful to improve awareness and knowledge on health, bring in positive behavior change, and enable preventive health measures among school children. Especially preventive school health interventions are considered to have major health implications in resource-poor countries which have meagre resources spend on treatment and health care for its population.^[1] India is a home for one-fourth of the global tuberculosis (TB) burden, of which 10% is suffered by the children.^[2] TB remains a stigmatized social disease in India, and the knowledge and awareness related to TB remain low in spite of being a major killer disease.^[3] While school health interventions in India have focused on aspects of hygiene, nutrition, dental health, reproductive health, obesity, mental health, and related issues, still TB-related school interventions are yet to be mainstreamed in spite of

the national mission to eliminate TB by 2025.^[4] There is a lack of evidence on participatory intervention models to promote TB-related knowledge and awareness among school children in India which could be sustainable in long run. We undertook an intervention study in the public schools of an Indian megacity, in which we utilized the school students themselves as educators for their co-students about TB and evaluated the outcomes.

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MATERIALS AND METHODS

Ethics committee of the Indian Council of Medical Research-National Institute for Research in TB approved this quasi-experimental study which was aimed at evaluating a student ambassador lead TB awareness intervention in public school settings. Between June 2017 and June 2019, we implemented and evaluated a school children lead participatory intervention to improve TB knowledge among their co-students in the public schools of Chennai metropolitan city, South India. Our study population comprised students enrolled from Class 7th to Class 9th that fall in the age bracket of 13–18 years.

A structured questionnaire was used the knowledge and awareness level of the school students before and after they were exposed to the ambassador lead interventions in their respective schools. The sample size for this evaluation was calculated as 920. This was consideration of the baseline prevalence of TB (40%) related knowledge in the community. Assuming that the intervention would cause a (5%) increase in the number of students who knew this information at follow-up, with $\alpha = 5\%$ and power = 80%, the required minimum sample size was calculated while considering a 20% loss to follow-up. The required sample size was proportionally divided within the selected five zones. Within each zone, two schools were selected by population proportion to size method. The students for interview evaluation were selected randomly using the class attendance register. Every 10th student in the class was selected to reach the required sample size in each school the sampling frame of the schools.

Intervention description

Formative phase: Exploration and identification

During the formative phase, the study team was involved in developing a student-friendly intervention training module for TB awareness purposes. A series of informal interviews were conducted with teachers and students of the selected school to get insights about their needs, preferences, and likes in terms of health information with reference to TB. Inputs on the different forms of TB sensitization, messages, and the different modes of communication were inquired, explored. Overall, the feasibility and acceptability of the TB sensitization interventions were explored and understood.

Intervention development

Based on the inputs from the explorative phase, it was identified that “audiovisual communications” and “TB talks” were feasible, acceptable, and preferred methods of TB awareness intervention for the study population. With the support of professional IEC managers, the following audiovisual materials were developed.

Care was taken that the visuals and languages used in these contents are ethically acceptable for school students, parents, and the teacher’s. The content of the materials was developed such that it provided all basic facts and information about TB. These intervention materials were developed with uniformity so that it could be replicated easily across schools. In addition, a variety of

participatory activities involving forms such as folk arts, street theatre, and role-play were developed to involve and equip the student ambassadors in TB awareness activity for their peers.

Student tuberculosis ambassador recruitment

Through a series of informal interaction and motivation sessions in the intervention schools, the study team recruited a total of 185 “student ambassadors” who were willing to be part of the proposed TB awareness intervention. The consent of the students’ parents and also the concerned school teachers were obtained for this. The role of student ambassadors was explained, and care was taken that their role was in agreement with their routine school responsibilities and tasks and does not affect their schooling.

Intervention implementation

The recruited student ambassadors were oriented and educated on TB-related knowledge using the student-friendly audiovisual materials and TB talks which were developed during the formative phase of the study. The orientation training for ambassadors was provided in two sessions, each extending for an hour.

Preparatory session 1

Audiovisual materials were used which provided all basic facts and information about TB which included using a PowerPoint TB causes, symptoms, modes of transmission, treatment, and prevention. In addition, the TB talk provided information and motivation on the role of student ambassadors in TB advocacy within their respective schools.

Participatory session-2

Ambassadors were trained on various participatory art forms, street theater, and role-play which conveyed TB-related knowledge in an artful and culturally acceptable way.

Post training intervention lead by ambassadors

Oriented and trained ambassadors were involved on providing TB knowledge at their respective school’s school level. The school meeting times, especially the prayer period at the morning session, were utilized for this purpose.

Intervention evaluation

To assess the outcomes of the ambassadors’ intervention in the school, school students who attended the TB awareness intervention were assessed on their TB knowledge. The intervention period for individual school was approximately 1 month in which the first 15 days were used to identify and orient the student ambassadors, and next 15 days in which the student ambassador lead intervention was implemented in the school for one or two times till all the students in the school were covered.

RESULTS

From a total of 4742 students across 20 intervention schools, 185 student ambassadors comprising 46% (87) male and 54% (98) female students were selected, trained, and involved in TB knowledge interventions. Of the 920 students sampled

and evaluated for their TB knowledge before and after intervention, we were able to enroll 818 (88.9%) at both time points. Table 1 shows that when compared to preintervention period, the highest change (>80%; $P < 0.05$) in the correct knowledge about TB among students was related to the use of X-ray and Sputum test for TB diagnosis, prevention of TB by maintaining cough hygiene, and loss of appetite as a symptom of TB. Overall, correct knowledge related to TB treatment was found to have increased moderately (16%–45%; $P < 0.5$), and knowledge related to TB symptoms was found to have increased by more than half (50%–80%; $P < 0.5$). The correct knowledge about the treatment availability in private hospitals was found to have reduced postintervention.

DISCUSSION

While multiple studies in the past have assessed the knowledge and awareness about TB among school children in India, we have developed, implemented, and evaluated a school student-driven intervention for TB awareness. The importance of this study finding is twofold. First, as an outcome which could be attributed to our intervention, the specific and correct knowledge on all aspects of TB, including its transmission, prevention, and treatment, were found to have increased by almost 40%–60% among students. While it is encouraging to achieve such significant levels in TB knowledge, contrarily, the level of decline with regard to the incorrect knowledge about TB in terms of its causes, transmission, and diagnosis was

found to be moderate. Such contrasting finding indicates that knowledge and awareness programs must not only priorities imparting accurate facts about TB but equally must impart unlearning of incorrect facts.^[5] This has practical implications since the incorrect facts about TB transmission routes and diagnosis could still dominate the health-seeking behaviors of the individual, especially students here in long terms. Second, the study highlights that students as a community could be effectively engaged for TB prevention activities and thereby providing a means to combat the social stigmatization surrounding TB at a young age in the community.^[6] The limitations of the present study are that, we have not conducted our intervention as a randomized trial and there could be confounders which could bias our findings on the knowledge improvement about TB.

CONCLUSIONS

Imparting knowledge about TB for school students through their co-students was found feasible and had resulted in positive improvements in knowledge level about TB in our study. The participatory nature of the intervention model has the advantage of scalability and replicating across school settings in India and thus could help in two ways to spread knowledge and could be a potential way to combat social stigmatization surrounding TB.

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Table 1: Students correct and incorrect knowledge about tuberculosis ($n=818$) before and after intervention

	Baseline		End-line		Change (%)	P*
	n (%)	95% CI	n (%)	95% CI		
Students accurate knowledge about TB ($n=818$)						
Mode of transmission of TB						
Airborne	369 (45.2)	41.6-48.5	770 (94)	92.2-95.6	52.0	<0.001
Knowledge on causes of TB						
Bacteria	254 (31.1)	27.8-34.3	635 (78)	74.6-80.4	60.0	<0.001
Knowledge of TB symptoms						
Cough with or without sputum	269 (32.8)	29.6-36.2	622 (76)	72.9-78.9	56.8	<0.001
Loss of appetite	77 (9.5)	7.5-11.6	424 (52)	48.3-55.3	81.7	<0.001
Weight loss	124 (15.1)	12.7-17.8	421 (51)	47.9-54.9	70.6	<0.001
Fever	130 (15.8)	13.4-18.5	326 (40)	36.4-43.3	60.3	<0.001
Night sweats	19 (2.3)	1.4-3.6	85 (10)	8.3-12.6	77.7	<0.001
Knowledge on TB diagnosis						
Chest x-ray and sputum test	91 (11.2)	9.0-13.4	592 (72)	69.1-75.4	84.5	<0.001
Knowledge on TB treatment						
TB patient need not be isolated	583 (71.6)	68.0-74.3	701 (86)	83.1-88.0	16.4	<0.001
TB patient need not be admitted	298 (36.4)	33.1-39.8	460 (57)	52.7-59.6	35.6	<0.001
TB is curable	489 (59.7)	56.3-63.1	778 (95)	93.4-96.4	37.3	0.002
TB treatment available government hospital	409 (50)	46.5-53.4	750 (92)	89.5-93.4	45.4	<0.001
TB treatment available private hospital	88 (10.7)	8.7-13.0	55 (6.9)	5.1-8.6	-55.1	0.003
Knowledge on prevention of TB						
Cover while coughing/sneezing	104 (12.8)	10.5-15.1	565 (69)	65.7-72.2	81.4	<0.001
Nutritious diet	108 (13.2)	10.9-15.7	283 (35)	31.3-37.9	61.7	<0.001

TB: Tuberculosis, CI: Confidence interval

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Conflicts of interest

There are no conflicts of interest.

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