

Cognitive function assessment on tuberculosis among senior school students in south Chennai, India

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Abstract: SETTING: A Sub-Urban private higher secondary School. OBJECTIVES: To determine students' knowledge on tuberculosis. DESIGN: Students from the eleventh standard were interviewed using structured questionnaire about the disease before and after Health Education. RESULTS: A total of 78 students with a mean \pm SE age of 15.1 \pm 0.08 years (range 14-17 years) Participated & Forty Three (55.0) who acquired knowledge about TB from Health professionals was found to be the main source of information. Students had 'adequate knowledge' about tuberculosis before Health Education as well McNemar's test showed a statistically significant major shift in proportion of students from 57.7 to 89.7 (P=0.000) for correct response from 'adequate' knowledge to 'exemplary' knowledge. Sixty three (80.8) from nuclear Family contributed to a significant improvement in post test Knowledge of TB. Students of those Parent with tertiary education had better knowledge than others. CONCLUSION: Audio Visual mode of Health Education on TB had improved the Cognitive Skill among the students. Adequate education on tuberculosis will help the younger generations to prevent TB in future.

Keywords: Knowledge, Tuberculosis, Health Education, Public Health, Preventive Measures

1. Introduction

Tuberculosis (TB) – A Pandemic, by definition, plays out on a massive scale – is a major Global Health problem. Each year there are around nine million new cases of TB and close to two Million deaths [1]. In 2012, 182 Member states and a total of 204 countries and territories that collectively have more than 99% of the World's TB cases reported data. Geographically the Burden of TB is highest in Asia and Africa. India and China account for almost 40% of the World's TB cases. Research to develop a point-of-care diagnostic test for TB and MDR-TB continues and other diagnostic tests are in the pipeline [2].

Awareness regarding Tuberculosis is very important for the School Children since it mostly affects young adults in their most productive years of life. India accounts for one fifth of global burden of Tuberculosis with two third cases in SEAR. It is more prevalent among adults i.e. more than 70% of TB cases are in the most productive age-group (15-54)

years, causing a Socio-Economic burden with an annual loss of 170 million workdays wherein 2/3rd of them are males [3].

1.1. Rationale of the Study

The Indian Government declared TB as NOTIFIABLE disease on May 17, 2012 [4]. Hence as researchers with Public Health responsibility from a Tertiary Care Medical College & Hospital, felt the need in delivering the preventive and curative measures on TB to the younger generation. The main aim was to assess the cognitive domain of learning about the TB disease before and after Health Education. This study was approved by the Research and Ethical Committee of our Institution.

2. Materials and Methods

Design: Educational Intervention Study

Place: Government recognized Private Higher Secondary School in South Chennai, India.

Participants: Students aged(14-17)years in 11th standard
Period: Nov 2012 to Mar 2013

Sampling Technique: Balanced Panel Sampling [5] at two time points, Two Higher Secondary Schools (one –Govt. & one - Pvt.) from the Sub-Urban area were chosen. All students from the randomly selected Private School were included in the study with the written informed consent from their parents too.

Sample Size: Assuming that 50% of the students will be aware about TB, The minimum required sample size was estimated to be 29 with 5% Type I error, limit of accuracy of 20% and an attrition of 20% . [6]

Methodology: Students cognitive skill was assessed before and after Health Education on TB by experienced Professionals over an interval of 4 months.

Material: A structured Questionnaire [7] with Demographic information and 16 items assessing knowledge on TB (closed type response) was used.

Intervention : Health Education on TB disease [Audio – Visual (Power Point presentation)] by Professor in Microbiology (Fig 1.) and Preventive aspects on TB by Professor in Community Medicine (Fig 2.) for nearly 45mts.



Fig 1. Professor of Microbiology



Fig 2. Professor of Community Medicine

Statistical Analysis: The baseline & TB information were analyzed using (SPSS 15.0). The results are presented as frequency, percentage along with inferential tests *Chi Square* and *McNemars Chi-Square*,[8] at 5% level of significance. The values within parentheses represent

percentage.

Results: The present study had forty two (53.8) males and thirty six(46.2) females with a majority seventy two (92.3) hindus and all participants were residing in their home and commuted by the Metro Transport from a distance ranging between (5-10)km to the school. From Table 1 we observe that Sixty three (80.8) of them hailed from the nuclear family and twenty nine (37.2) parents had a highest educational qualification to be Tertiary and Sixty seven (85.9) were skilled employers with a maximum forty three (55.1) had a PCI of 2000 and above.

Table 1: Demographic Information of Students

Variables		N	%
Sex -	Male	42	53.8
	Female	36	46.2
Religion-	Hindu	72	92.3
	Muslim	3	3.8
	Christian	3	3.8
Residence-	Home	78	100.0
	Hostel	0	0.0
Parent Education -	Illiterate	3	3.8
	Primary	1	1.3
	Secondary	19	24.4
	Higher Secondary	24	30.8
Parent Occupation -	Tertiary	29	37.2
	Professional	4	5.1
	Managerial	5	6.4
	Clerk & Skilled	67	85.9
	Semiskilled	1	1.3
Family Type-	Unskilled	1	1.3
	Joint	15	19.2
	Nuclear	63	80.8
Diet -	Vegetarian	13	16.7
	Mixed	65	83.3
PCI/month (BG Prasad 2011)			
≥ 5000		20	25.6
2001 – 5000		23	29.5
1251 – 2000		22	28.2
1000 – 1250		7	9.0
< 1000		6	7.7
Smoker -	Yes	3	3.8
	No	75	96.2
Alcoholic -	Yes	1	1.3
	No	77	98.7
Source of Information - Mass Media		23	29.5
One to One Communication		43	55.1
Both		12	15.4
Brothers -	0	45	57.7
	1	30	38.5
	2	2	2.6
	3	1	1.3
Sisters-	0	39	50.0
	1	34	43.6
	2	5	6.4

Sixty five (83.3) students were on mixed diet, three (3.8) smokers and one (1.3) alcoholic, whereas ten (12.8) of their family members were smokers. The sources of information on TB revealed that twenty three (29.5) as Mass Media, forty three (55.1) from One to One (Health Professionals) communication and twelve (15.4) from both.

Before Health education twenty six (33.3) didn't know about extra-pulmonary TB, fifty nine (47.4) thought young adults are not affected. Thirty five (44.9) weren't aware about its free treatment as well as DOTS programme. Difference in the proportion of correct response before and after Health education was statistically significant only for few items and is provided in Table 2.

Table 2: Proportion of Students with Correct Response

Questions	[N (%)] Before HE , After HE	χ^2 - value (P-value)
TB is caused by Bacteria	64(82.1) , 76(97.4)	9.38(0.002)*
Lung is the mostly affected Organ	64(82.1) , 75(96.2)	5.02(0.025)*
TB also affects Kidney, Bone, Spine & Brain	26(33.3) , 65(83.3)	2.26(0.133)
TB mostly affects Young Adult	41(52.6) , 69(88.5)	9.26(0.004)*
TB is Curable & Preventable	64(82.1) , 74(94.9)	9.31(0.002)*
TB spreads from Person to Person through Air	76(97.4) , 76(97.4)	0.05(0.816)
Smoking is one of High risk factor for TB	68(87.2) , 76(97.4)	2.53(0.111)
Cough & Weight Loss are common symptoms of TB	74(94.9) , 78(100.0)	No Difference
People ill with TB can infect upto 10-15 people through close contact over a period of one year	57(73.1) , 72(92.3)	1.75(0.185)
TB treatment is free of cost	35(44.9) , 72(92.3)	0.35(0.554)
Sputum AFB test is the diagnostic test of choice	42(53.8) , 62(79.5)	2.16(0.141)
DOTS refer to a method of treatment of TB	39(50.0) , 70(89.7)	0.00(1.000)
TB treatment is for 6-9 months	50(64.1) , 76(97.4)	0.17(0.674)
BCG vaccine prevents TB	63(80.8) , 72(92.3)	9.41(0.002)*
March 24 is WORLD TUBERCULOSIS DAY	59(75.6) , 73(93.6)	0.05(0.814)
Good Ventilation, Air Filtration & Isolation method are preventive measures from Active TB patients	70(89.7) , 70(89.7)	7.18(0.107)

HE – Health Education ; *Statistically Significant

So we decided to look into the weightage of the correct response. Hence all 16 items measuring knowledge on TB were given a Score of '1' for correct response and a '0' for incorrect answer. The proportion of students with correct response at two time points was assessed for each item by *Chi-Square* test. Since we didn't find much statistical significance for each item, we then converted the obtained scores to percentage and grouped their knowledge as (0% to 50%)

'INADEQUATE', (50% to 75%) 'ADEQUATE' and (75% and above) 'EXEMPLARY'. Later we observed a statistically significant difference in each group, i.e. after Health Education, we could observe a major shift of scores for correct response [Fig 3.] from ADEQUATE to EXEMPLARY knowledge, i.e. 57.7% to 89.7% and was Statistically Significant with $\chi^2 = 12.5$ ($P=0.014$) [*McNemar - Bowker Test* = 45.09 ($P=0.000$)]

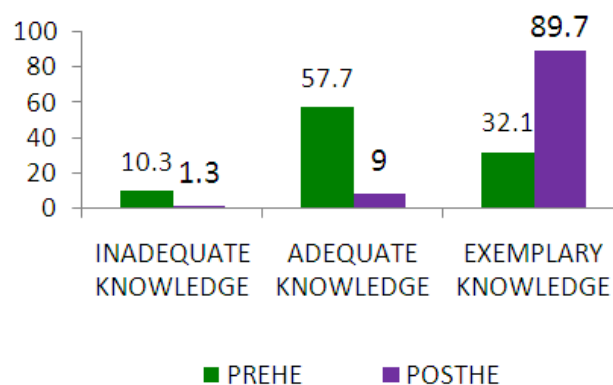


Fig 3. McNemar's Result on Health Education for TB

3. Discussion

Mycobacterium tuberculosis has been infecting the human race since the dawn of history. The prime objective of this community based study was to assess the effect of health education in improving knowledge about the disease among 78 adolescents by Balanced Panel

Sampling technique. We had Audio visual mode of health education session as intervention for measuring knowledge on TB amongst higher secondary school which was also implemented in Vijayaprasad study [9]. The questionnaire evaluated knowledge of TB transmission, prevention, and treatment. Almost all knew that TB is contagious and more than two thirds knew that TB is treatable and that TB preventive therapy existed. Our study did not have enough evidence whether their elder brothers and sisters contributed to their knowledge in TB.

After Health education in the present study overall correct response score was 98%, among which 99% correct response to queries related to etiology, 98% for possible routes of transmission, 99% for symptoms, and 99% for treatment.

Knowledge deficits were observed in the etiology, transmission, and treatment of tuberculosis were identified as mentioned in the literature below. J.A. Corless [10] in his

survey suggests that Knowledge about TB is limited in Computer Literate individuals throughout the World. Rahul & Sunil [11] felt, more studies are needed to assess the knowledge of postgraduate students on TB and its management practices in reference to RNTCP. Liam, CK et al [12] found that the Malaysian patients had limited understanding and knowledge about TB. Also they had misconceptions and limited knowledge about the disease and its treatment.

Singla [13] and his research team found that only 40.2% of tuberculosis nurses and 10.7% of general hospital nurses had a satisfactory level of awareness. There is a general lack of knowledge regarding various aspects of TB among Nurses. Lai, K.K.[14], said Only 87% of Health care workers with patient-contact felt that respiratory precautions should be instituted for TB patients. M.W. Uplekar,[15] study revealed gaps and weakness in the private doctors' reported practice of managing lung tuberculosis, the most important and persistent problem of public health concern in India.

4. Conclusion

The present study proves the importance of Health Education to the adolescents in school about TB, which is the need of the hour for our nation's younger generation. The priority was given more on the preventive aspect. Even though Audio Visual aid was effective in this study, the other modes of intervention like Role play, Group Discussion, Posters, Printed Handouts, Film Show, etc should also be experimented for the School Children. Active interventions are required to improve awareness for a better implementation of the revised national tuberculosis control programme in India.

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