

RESEARCH ARTICLE

Adoption and Implementation of Tobacco Control Policies in Schools in India: Results of the Bihar School Teachers Study

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Abstract

Implementation of no tobacco policies in schools is associated with lower tobacco use among teachers and students. In this study we assessed the extent that a school-based intervention for teachers resulted in adoption and implementation of tobacco control policies. From a random sample of government schools (8th-10th), 72 were randomized into intervention and control conditions. Intervention included health education programs for teachers and support for tobacco control policy implementation. Adoption and implementation of policies were assessed at baseline and immediately after intervention. All 36 intervention and one control school adopted a tobacco-control policy. Higher enforcement of tobacco-control policy was at post intervention (OR=3.26; CI: 2.35, 4.54) compared to baseline in intervention schools. Some 64% of intervention and 28% control schools showed “improvement” in policy implementation. Adoption and implementation of no tobacco policies was positively impacted by intervention. This study provides support for scaling up of school-based tobacco control interventions to promote school tobacco control policies.

Keywords: Tobacco policy - schools - adoption - implementation - intervention - India

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Introduction

Tobacco use is a global epidemic that kills nearly six million people annually. By 2030, tobacco attributable deaths are projected to increase to eight million people worldwide each year with 80% of deaths among people living in low and middle income countries (World Health Organization, 2011). Considering this exigency, the Framework Convention on Tobacco Control (FCTC) the first public health treaty that focused on tobacco control was adopted by member nations of the World Health Organization (WHO) in 2003 (World Health Organization, 2013). India was among the first few countries to ratify the FCTC in 2004. Additionally, India enacted national legislation: ‘The Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act (COTPA) in 2003, before the FCTC was ratified (Kaur and Jain, 2011).

In line with the FCTC requirements, the provisions under COTPA included prohibition on smoking in public places; prohibition of tobacco advertising; prohibition of the sale of tobacco products to and by minors; ban of sale of tobacco products within 100 yards of educational institutions; and mandatory display of pictorial health

warnings on tobacco products (Tobacco Control Act of India, 2003). To support and strengthen the implementation of “prohibition of the sale of tobacco products to and by minors” and “prohibition of sale around educational institutions” i.e. section 6 of COTPA, the Ministry of Health & Family Welfare developed Guidelines for Tobacco Free Educational Institutions which have been adopted by the Central Board of Secondary Education (CBSE) for their schools (Guidelines for Tobacco- free Schools / Educational Institutions, 2009).

School tobacco control policies can be effective in supporting tobacco use prevention among students, tobacco use cessation among teachers, and increased teaching about tobacco prevention in classrooms (Goldstein et al., 2003). Similarly, in India, the evidence shows that schools in the state of Bihar with tobacco control policies have reduced tobacco use while those without such a policy have significantly higher tobacco use by both students and school personnel including in rural and urban areas (Sinha et al., 2004a; Sinha et al., 2004b).

Tobacco use is high among teachers and students in some parts of India. According to the Global School Personnel Survey 2000, 78% of teachers in Bihar used some form of tobacco (Sorensen et al., 2005) Among students, the prevalence of current use of any tobacco

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was about 60% (Sinha et al. 2004c). This study, the Bihar School Teachers Study (BSTS), was designed to promote tobacco cessation among school teachers and other school personnel. It also focused on implementable tobacco control policies in the schools in Bihar through a comprehensive school-based tobacco control intervention program called “Tobacco Free Teachers / Tobacco Free Society” (TFT/TFS) (Sorensen et al., 2013). This paper analyzes the extent to which participating schools adopted and implemented tobacco control policies as a result of the TFT/TFS program.

Materials and Methods

Study Design

BSTS was a cluster randomized controlled trial designed to test the efficacy of a comprehensive school-based tobacco control intervention for teachers in Bihar schools. The intervention design was based on a conceptual model integrating social contextual theory and behavior modification in order to maximize behavior change. A more detailed description of the intervention and study design is detailed elsewhere (Nagler EM et al., 2013). Briefly, a total of 72 government rural and urban schools representing grade levels 8-10 were selected by random sampling from 10 districts of Bihar. Thirty-six schools were randomly assigned to an intervention arm and the remaining 36 were assigned to the delayed-intervention control arm. The study was conducted in two waves over two successive academic years (2009-2010 & 2010-2011), each with 36 schools, 18 intervention and 18 control. The school served as the unit of intervention and randomization. One objective of this study was to assess the extent to which schools adopted and implemented comprehensive tobacco control policies as a part of TFT/TFS program. The study was a collaboration among the Healis-Sekhsaria Institute for Public Health in Mumbai and Patna, India, and the Dana-Farber Cancer Institute and Harvard T. H. Chan School of Public Health (HSPH), Boston, Massachusetts in the United States, and was approved by the Indian Council of Medical Research and the Healis and the HSPH Institutional Review Boards.

The Tobacco-Free Teachers Tobacco Free Society (TFT/TFS) Program

The TFT/TFS program included two primary components: educational programs for school personnel for tobacco use cessation and support for adopting and implementing tobacco-free policies. During the seven month-long intervention program, the health educators of the project visited intervention schools monthly to meet with teachers and to provide technical assistance in support of both components of the program. The TFT/TFS program additionally focused on providing schools with strategies for policy enactment and implementation. To develop the intervention, the tobacco control policy consultation materials were pre-tested in two schools that were not involved in the study and the intervention program was revised based upon the pre-test results. As part of the TFT/TFS intervention program, the health educators or intervention coordinators explained (1) the

benefits of a school tobacco policy; (2) procedures for adopting and implementing this; and (3) developing an action plan. During the visits to schools, these health educators also presented sample policies and rationale to the principals and lead teachers or program liaisons. Schools were encouraged to write the policy on their letterhead and to display on school notice board. A tobacco policy workgroup was also formed in every school, with the responsibility of regularly announcing the policy and monitoring its implementation in each school as a way to build organizational support for quitters by creating a tobacco-free school campus. The health educators encouraged the adoption and implementation of clearly articulated school policies prohibiting all forms of tobacco use on school property, to be applied fairly and consistently. This was done by providing “No Tobacco” signs to the schools and motivating them to paint the policy on the school walls for communicating messages (Pawar et al., 2015). The policy did not emphasize or include any punitive measures. The school principals were encouraged to inform and promote compliance with the national legislation prohibiting sale of tobacco within 100 yards of schools. The TFT/TFS intervention was designed to motivate schools to go beyond being smoke-free (which is required by law) and also become tobacco-free campuses.

Data Sources

The data were collected from two instruments created for this study to evaluate the effectiveness of the TFT/TFS intervention program on policy adoption and implementation. These were: 1) a Policy Observation Checklist; and 2) a School Personnel Survey. “*Policy adoption*” was defined as the stage at which the tobacco control policy was approved and authorized by the school. Subsequently, “*policy implementation*” was defined as the stage at which the adopted tobacco control policy was put into effect. In this paper, tobacco control policy adoption meant recording of a tobacco control policy on school’s letterhead, painting policy on the wall, and posting of at least one “No Tobacco” sign in the school premises, whereas, the policy implementation referred to the extent to which adopted policies were followed and indications of tobacco control were seen in the school premises. Data were collected at two time points: (1) at baseline (at the beginning of school year i.e. Wave 1-June-July 2009, Wave 2- June- July 2010); and (2) immediately after the intervention (at the end of the school year i.e. Wave 1-March-April 2010, Wave 2- March- April 2011). The details of both assessments are provided below.

a). Policy observation checklist

Data collection: The policy observation checklist tool was used to note observations on placement and clear visibility of “No Tobacco” sign boards around the school and observable indicators of tobacco use. The trained study project staff independently without involving any school personnel) observed the school premises carefully and completed the checklist at the baseline and post intervention for all 72 schools. The data were entered in the computer and cross-checked with the field notes of the staff.

Measures: The policy observation checklist was used for objective assessment of tobacco use indications on school premises. Four items from the policy observation checklist were: 1) “how many ‘No Tobacco’ signs and banners are visible in the entire school premises”; 2) “places in and around the school where you see spit and staining from chewing tobacco; 3) “places in and around the school where you see wrappers from chewing tobacco”; 4) “places in and around the school where you see signs of smoking tobacco (i.e. ashes, butts, discarded packages etc.). The adoption and implementation of a tobacco control policy in schools was measured by assigning scores (Stephens and English, 2002) for the “number of locations found in the school premises with “indications of tobacco use”. The 10 locations in the policy observation checklist were: 1) in and around entry to school; 2) in and around hallways in school; 3) in and around the teachers’ break room or lounge; 4) in and around classrooms (Planters and flower pots-usually people spit in corners where these lie); 5) in the corridors; 6) in the school toilets; 7) in dustbins; 8) along the walls of the school inside and outside; 9) on the playground; 10) other places. Since the maximum number of locations observed was 10, the schools showing with “k” indicators of tobacco use was given the “score 10-k” where k ranges from 0 to 10. The school was termed “Improved” if the post intervention score was higher than the baseline score, “Not improved” otherwise.

b). School Personnel Survey

Data collection: The school personnel survey was used to assess tobacco use, cessation, intention to quit, self-efficacy, social norms, socio-demographic characteristics and perception of policy among school teachers. All teachers in the school were invited to participate in the survey. Six survey administrators were trained using a standardized field protocol. Informed consent was obtained prior to survey administration by survey administration staff. The survey was self-administered at the baseline and post intervention in Hindi, the local language in Bihar. It was administered inside an empty classroom or in a private space in the school during class breaks in order to obtain individual teacher responses and to reduce pressure to give positive answers.

Measures: The school personnel survey was used to measure policy adoption through two questions: 1) “Does your school have a policy or rule specifically prohibiting smokeless tobacco use inside the school?” 2) “Does your school have a policy or rule specifically prohibiting smoking tobacco use inside the school? There were three questions asked to measure the policy implementation in the school personnel survey, i.e. 3) “Can tobacco products be bought within 100 yards of your school? 4) Are any signs posted in your school warning that tobacco use is not allowed?” 5) How well does your school enforce any of its policies (or rules) on tobacco use?” The response categories were “yes” & “no” for items 1) to 4). Teachers who responded “yes” to one or more of the questions were given a “1” on this variable whereas other teachers who responded “no” received a “0”. For question 5), “the four response categories were; a) “there is no policy or rule

on tobacco use in school; b) “policy or rule is completely enforced; c) “policy or rule is partially enforced; and d) “policy or rule is not at all enforced”. The affirmative responses were collapsed to create a dichotomous variable: “yes” or “no”. The responses with “policy or rule is completely enforced” were kept in the “yes” category and all other responses were combined together in the “no” category.

Data analysis

The data from the policy observation checklist and the school personnel survey, conducted at the baseline and post intervention were combined and compared between intervention and control conditions. Data were analyzed using descriptive statistics, frequencies and bivariate analyses (cross tabulations). The odds ratios (ORs) of policy differences were calculated from baseline to post intervention between and within the intervention and control arms. Further, these ORs were compared for tobacco control policies differences and implementation in schools between intervention and control arms with 95% confidence intervals (CI) at baseline and post intervention for each variable.

Results

a). Policy Observation Checklist: The policy observation checklist was completed at baseline and post intervention in all 36 intervention and 36 control schools. In the pre-intervention checklist, only one school in the intervention arm had “No Smoking” sign. In post-intervention survey, all 36 schools in the intervention arm had one or more “No Tobacco” signs, whereas only one school in the control arm had no tobacco signs post intervention (Table 1).

At the baseline, spit marks and staining from chewing tobacco in and around classrooms; corridors; schools toilets; dustbins and playgrounds) were not significantly different between the intervention and control schools. However, at the post intervention, the odds ratios were significantly lower than one for in and around classrooms; corridors; schools toilets; dustbins and playgrounds in intervention schools compared to control schools (Table 1).

The wrappers of chewing tobacco were seen in the corridors; school toilets; dustbins and on the playgrounds of all the schools at baseline and post intervention. At baseline, there was no significant difference in observing wrappers of chewing tobacco in these areas, between the intervention and control schools. Post intervention, the odds ratios of observing wrappers of chewing tobacco decreased significantly in the corridors of intervention schools compared to control schools, but not in other areas.

The signs of smoking tobacco (ashes, butts, discarded packages) on the playgrounds between intervention and control schools at baseline and post intervention did not reveal any difference.

Figure 1 and Figure 2 show the cumulative percentages of intervention and control schools on the basis of the policy implementation scores, which summarized the

Table 1. Odds Ratios (ORs) & 95% Confidence Intervals (CIs) for the Association of Locations with Indications of Tobacco Use at Baseline and Post intervention (PI) - Policy Observation Checklist

Variable	Baseline		Odds Ratio (95% CI)	Post Intervention		Odds Ratio (95% CI)
	Intervention	Control		Intervention	Control	
No. of “No Tobacco” warning signs						
- None	35	36	-	0	35	
- 1& more	1	0		36	1	-
Spit marks and staining from chewing tobacco seen at following places						
In and around classrooms	12	9	1.44 (0.46, 4.57)	6	17	0.22 (0.06, 0.78)
In the corridors	26	23	1.36 (0.44, 4.20)	10	20	0.30 (0.10, 0.90)
In the school toilets	20	18	1.18 (0.42, 3.34)	7	17	0.26 (0.08, 0.85)
In dustbins	15	15	0.95 (0.33, 2.72)	14	23	0.30 (0.09, 0.97)
On the playground	21	24	0.64 (0.22, 1.89)	19	27	0.24 (0.06, 0.85)
Wrappers from chewing tobacco seen at the following places						
In the corridors	20	17	1.32 (0.47, 3.75)	6	22	0.13 (0.04, 0.45)
In the school toilets	15	17	0.79 (0.28, 2.26)	7	14	0.38 (0.11, 1.23)
In dustbins	11	10	1.10 (0.35, 3.44)	14	23	0.38 (0.13, 1.14)
On the playground	20	22	0.91 (0.33, 2.53)	20	27	0.42 (0.13, 1.35)
Signs of smoking tobacco (i.e. ashes, butts, discarded packages) at the following places						
On the playground	13	14	0.79 (0.26, 2.40)	9	16	0.40 (0.13, 1.25)

^aThe ORs calculated using “No” as reference category for each variable in intervention and control arms

Table 2. Odds Ratios for School Policy at Baseline and Post Intervention – School Personnel Survey

Variable	Baseline		Odds Ratio (95% CI)	Post Intervention		Odds Ratio (95% CI)
	Intervention n=387 (%)	Control n=369 (%)		Intervention n=357 (%)	Control n=327 (%)	
Can tobacco products be bought within 100 yards of your school?	32.0	26.2	1.28 (0.92, 1.80)	24.9	28.4	0.77 (0.54, 1.11)
Does your school have a policy or rule specifically prohibiting smokeless tobacco use inside school?	42.6	47.9	0.73 (0.53, 1.00)	84.5	48.3	7.54(4.92, 11.60)
Does your school have a policy or rule specifically prohibiting smoking inside school?	43.9	49.8	0.74 (0.54, 1.01)	86.8	53.2	0.74 (0.54, 1.01)
Are any signs posted in your school warning that tobacco use is not allowed?	12.1	15.4	0.75 (0.48, 1.16)	97.4	23.2	280.46 (97.02, 913.78)
The policy or rule is completely enforced	32.5	40.6	0.69 (0.51, 0.95)	69.4	41.2	3.26 (2.35, 4.54)

^aThe ORs calculated using “No” as reference category for each variable in intervention and control arms ^bTotal percentages may not add up due to exclusion of missing cases *Significant at p< (less than equal to) 0.05

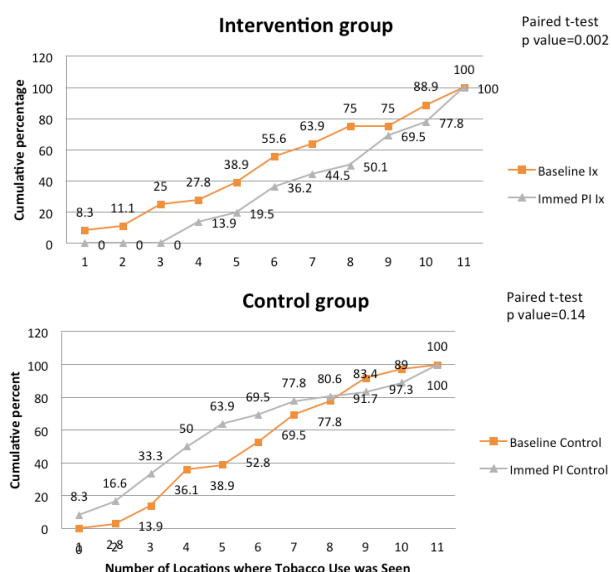


Figure 1. Policy Score Differences between Baseline and Post Intervention (PI)

number of locations where indicators of tobacco were observed. Using paired t-test in the intervention schools, the difference between the policy scores was significant between baseline and post intervention (PI) (p = 0.002) while not insignificant among the control schools (p = 0.14).

b). School Personnel Survey: 756 of 947 eligible participants completed the baseline survey (80% response rate) and 684 completed the post intervention survey (72% response rate). From the baseline to the post intervention, there was no change in the availability of tobacco products within 100 yards of school between the intervention and control schools (Table 2). At the baseline survey, there was no significant difference in policies specifically prohibiting smokeless tobacco use and smoking between the intervention and control schools. At post intervention, the odds of teachers reporting adoption of a policy or rule prohibiting smokeless tobacco inside the school were eight times higher in intervention schools as compared to control schools. Similarly, the odds of teachers reporting

adoption of a policy or rule prohibiting smoking tobacco inside the school were six times higher in intervention schools as compared to control schools. The odds of having signs posted in schools warning that tobacco use is not allowed were not significantly different at the baseline, in intervention and control schools. However, at the post intervention, the odds of signs warning that tobacco use was not allowed were significantly higher (280 times) among intervention relative to control schools.

At baseline, the odds of teachers reporting that the policy or rule on tobacco use was enforced in intervention schools were significantly lower than in control schools, whereas post intervention, the odds of having the policy or rule enforced were three times higher in intervention schools as compared to control schools.

Discussion

The TFT/TFS school based tobacco control intervention was effective in promoting adoption and implementation of tobacco control policies in schools as a way toward making the campus tobacco free. Tobacco control policies were implemented in all 36 intervention schools as a result of the TFT/TFS program. After schools had been exposed to the over seven months of this intervention, 100% intervention schools adopted a tobacco control policy as defined by recording of tobacco control policy on their letterhead, painting the policy on the wall, and posting of at least one "No Tobacco" sign in the school premises. At the post intervention, the enforcement of a tobacco control policy or rule was higher in the intervention schools as compared to control schools. Approximately 64% of intervention and 28% of control schools showed "improvement" in policy implementation at the post intervention compared to the baseline. These results clearly indicate that tobacco-free school policies were significantly more likely to be implemented in intervention schools as compared to control schools. This suggests that the TFT/TFS program was successful in sensitizing and raising awareness of school personnel and authorities about tobacco use in schools.

Research from Western countries provides evidence of the importance of curbing tobacco use by enforcing smoke-free policies in schools (Pentz et al., 1989; Charlton et al., 1994; Pentz et al., 1997). The TFT/TFS program was successful in not only curbing smoking in school premises but also encouraged schools to become tobacco-free. The strengths of this study include its randomized controlled design. The tobacco policy intervention component of the TFT/TFS program included salient features of the tobacco control legislation in India such as prohibition of sale of tobacco products within 100 yards of educational institutions; ban on the sale and purchase of tobacco products to minors (less than 18 years of age); display of "no smoking" boards; display of a "Tobacco Free School" board at the main entrance of the school etc. These formed integral components of the TFT/TFS, BSTS intervention strategy including wall paintings of the school's policy, having a written tobacco policy, "No tobacco" signages etc. Also, the information on assessing policies relied on data collection through two independent data sources, i.e.

the policy observation checklist.

The study team faced a few challenges while implementing the TFT/TFS intervention. One of the challenges was misidentification of candy wrappers as smokeless tobacco wrappers. The possible reason could be that these areas of the school premises were accessed by outsiders or people from the nearby community as well. The school premises were also used by the community for organizing social events, marriage celebrations, playing etc. during the non-working hours of schools. Another challenge was to engage the tobacco policy workgroup actively throughout the program. Although the policy workgroup was formed in each school it did not meet often, and was generally given only limited decision making authority relative to that of the principal.

The several limitations of the data presented here include possible bias in measures and lack of long-term follow up as we could not evaluate the maintenance of the tobacco control policy adoption and implementation. Another limitation was that we did not include reports from principals regarding their perceptions of the policy implementation in schools. Despite several challenges and limitations presented in this paper, we took relevant preventive measures to reduce the effect of potential bias through training and regular cross-checking measures to ensure the accuracy of the collected information.

The findings from this paper provide evidence on effective implementation of tobacco control policies in Bihar schools as a result of the intervention. The results support the conclusion that a comprehensive intervention program can help schools in adopting and effectively implementing a tobacco control policy.

The school-based policies and rules as part of the intervention tested a potential approach to address the critical issue of tobacco use in school settings. There is a need for subsequent evaluations of this intervention to provide a robust test of its efficacy. Future research on the effectiveness of school-based tobacco control policies to curb tobacco use in India is much needed for promoting health in schools.

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