

Original Research Article

A cross-sectional survey on violation of cigarettes and other tobacco products act around education institutions in Puducherry

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ABSTRACT

Background: India is the second-largest tobacco consumer in the world and is responsible for around 1.3 million deaths every year. To achieve tobacco control amongst youth, it is essential that there should be strict enforcement of cigarettes and other tobacco products act (COTPA) in the vicinity of educational institutions. Objectives were to measure the violation of COTPA section 4 and 6 in Puducherry.

Methods: An observational survey on COTPA violation was conducted over a period of three months in Puducherry among 300 educational institutions and tobacco point of sale (PoS). Two-stage sampling technique was used. Epicollectv5 incorporating the observational checklist was employed for data capturing and analysis was done with SPSSv24. The institute's ethics committee approval was obtained.

Results: 145 (48.3%) violated section 6b. Violation of section 6a was observed in the form of tobacco products sale by minors in 1 (0.7%) and tobacco products sale to minors in 58 (40%) amongst those 145 tobacco PoSs. Only 32 (10.7%) educational institutions complied to statutory display of "No smoking signage" board at the entrance of the educational institutions as per COTPA section 4. Active smoking was noticed within 100 meters radius in nearly half of the institutions i.e., 133 (44.3%).

Conclusions: This study showed that implementation of COTPA sections 4 and 6 in Puducherry to be deficient. It will need a concerted effort from all parties involved, including the police, educational institutions, and the local community to enforce strict implementation of the legislation for tobacco control.

Keywords: COTPA, Section 4, Section 6, Educational institutions, Observational survey

INTRODUCTION

Tobacco use is a major risk factor for many chronic diseases, including cancer, lung disease, cardiovascular disease and stroke and accounts for nearly seven million deaths every year worldwide.¹ India is the second-largest tobacco consumer in the world, and it is responsible for around 1.3 million deaths every year, making it the biggest preventable cause of death.² The most prevalent form of tobacco use in India is smokeless tobacco and commonly used products are khaini, gutkha, betel quid with tobacco and zarda. Smoking forms of tobacco used

are bidi, cigarette and hookah.³ Tobacco use in children and adolescents is reaching pandemic levels. The world bank has reported that nearly 82,000-99,000 children and adolescents all over the world begin smoking every day.⁴ About half of them would continue to smoke to adulthood and half of the adult smokers are expected to die prematurely due to smoking related diseases. If current smoking trends continue, tobacco will kill nearly 250 million of today's children.⁵

The prevalence of tobacco use in Puducherry is about 11.2%, where the male population contributes about 17.7% and the female population is about 5.1%.⁶ The

effective implementation of any legislation is a collective responsibility of multiple stakeholders, each with clearly defined roles and responsibilities.⁷

The chief provisions of the act were banning of direct and indirect advertisements of tobacco products, prohibition of smoking in public places, sale of tobacco to minors, and smoking within a radius of 100 yards of educational institutions.⁸ The law intends to prevent the present and future generations from the adverse effects of tobacco use by forestalling youth.⁹

To achieve tobacco control amongst youth, it is essential that there should be strict enforcement of the COTPA in the vicinity of educational institutions. The government of India released the 'guidelines for tobacco-free schools/educational institutions' in 2019 and 'step-by-step guidelines for implementation of section 6b of the act and rules' in 2017.¹⁰

With this background, objective of this study was to measure the violation of COTPA section 6a (prohibition of sale of tobacco products by and to those who is under 18 years of age) and section 6b (prohibition of sale of tobacco products within 100 meters radius of educational institutions). In addition, to measure the violation of COTPA section 4 (prohibition of smoking in public places-within 100 meters radius of educational institutions) and mandatory display of "No smoking" signage at the entrance or walls of the educational institutions as mentioned in COTPA. A typical signage must be of 60×30 cm dimensions as shown in Figure 1.

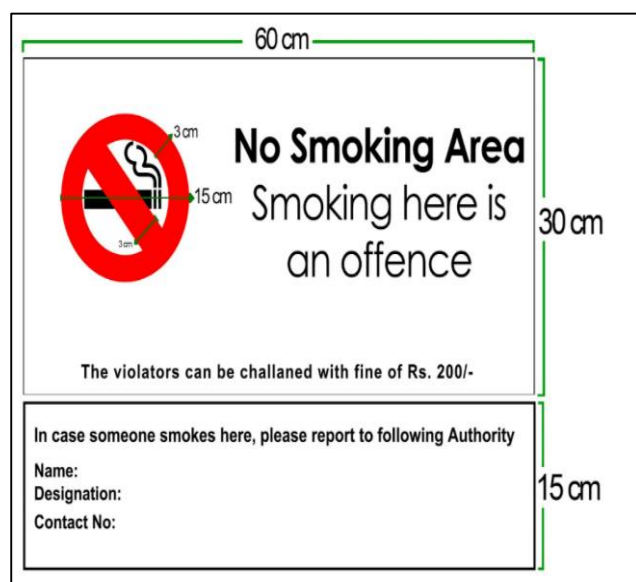


Figure 1: No-smoking signage for educational institutions as per COTPA section 4.

METHODS

A cross-sectional observational survey on COTPA violation (Section 4, 6a & 6b) was conducted over a

period of three months (August to October 2022) in Puducherry. Educational institutions and tobacco PoS around the selected educational institutions were included for the study. In this study, operational definition for tobacco products was the list of products specified in the COTPA schedule such as Cigarettes, Cigars, Cheroots, Beedi, Cigarette tobacco, pipe tobacco and hookah tobacco, Chewable tobacco, Snuff, Pan Masala or any chewing material having tobacco as one of its ingredients (by whatever name called), Gutka and Tooth powder containing tobacco. Considering violation of sections 6a and 6b around educational institutions to be 83.3%,⁽¹⁰⁾ absolute precision as six and design effect as two in this formula $n = \frac{Z_{(1-a/2)}^2 pq}{d^2}$, the sample size was calculated to be 298, which was rounded to the highest figure of 300. Multi-stage sampling technique was employed where, in stage one the educational institution present in Puducherry were stratified as urban and rural. In stage two, using list of educational institutions as the sampling frame, simple random sampling was employed to select the institutions. The educational institutions were anonymized. The nearest tobacco Points of Sales (PoS) from the selected educational institutions was chosen for observation of COTPA section 6a violation (distance between the institution and PoS was identified using google map). The observations were conducted around educational institutions and tobacco Points of Sales (PoS) located near the selected educational institutions. Epicollect_5 (v4.2.0; Centre for Genomic Pathogen Surveillance) application incorporating the structured observational checklist was employed for data capturing. The selected educational institutions and tobacco PoS were observed covertly for at least 30 minutes during evenings (3:00 pm to 5:00 pm) to ensure the quality and reliability of data. The photographs of observed violations were clicked for supporting evidence. This survey was an unobtrusive observational study. Hence, no prior informed consent from the tobacco PoS vendors were taken for making the observation. The institute's scientific and ethics committee approval was obtained before the commencement of the study. The collected data was analyzed using standard software Statistical Package for the Social Sciences (SPSS) (v24.0; IBM Corp, Armonk, New York) software. The data has been presented in the form of numbers and percentages for qualitative variables and mean and SD/median& IQR for quantitative variables. Appropriate test of significance was used to find out the association depending on the nature and distribution of variables like Chi-square test or Fisher's exact test for categorical variables. Values of $p < 0.05$ was considered to be statistically significant.

RESULTS

The mean (SD) duration of observation of tobacco PoS and educational institutions in this study was found to be 16.08 (2.04) minutes. The general characteristics of the selected educational institutions have been depicted in Table 1.

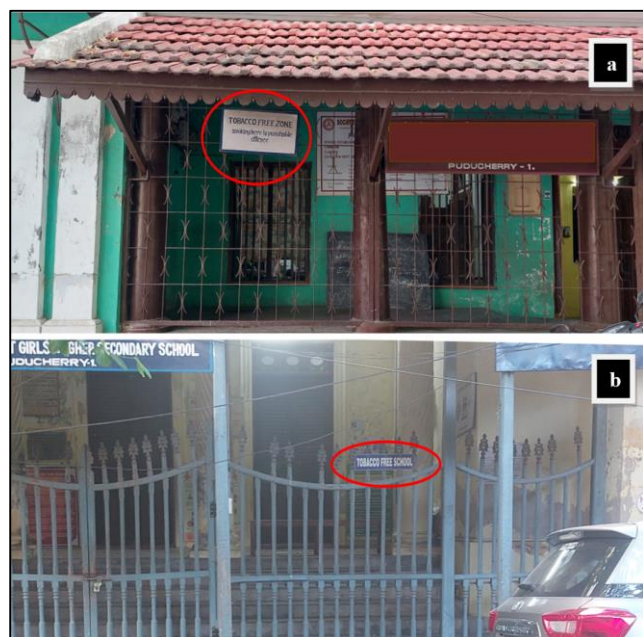
Table 1: General characteristics of educational institutions (n=300).

Variables		N (%)
Type	College	69 (23.0)
	School	231 (77.0)
Administrative type	Government	142 (47.3)
	Government-aided	6 (2.0)
	Private	152 (50.7)
Locality	Rural	160 (53.3)
	Urban	140 (46.7)

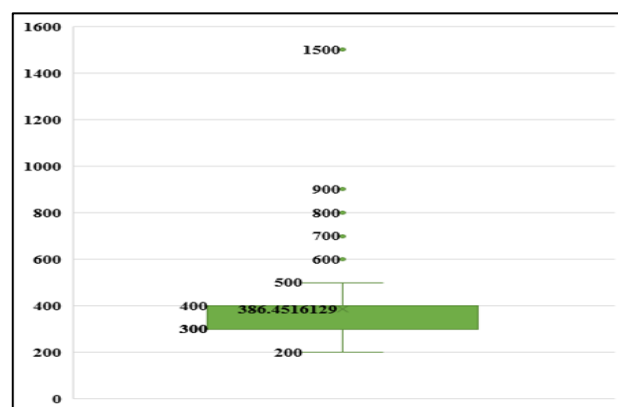
The violation of COTPA sections 6a and 6b have been illustrated in Table 2. Nearly half of the educational institutions, 145 (48.3%) violated section 6b (No person shall sell, offer for sale, or permit sale of, cigarette or any other tobacco product in an area within a radius of 100 of any educational institutions). Tobacco was not a major business in all those 145 tobacco PoSs identified within 100 meters radius of educational institutions. Violation of section 6a (prohibition on sale of tobacco products by and to those who is under 18 years of age) was observed in the form of tobacco products sale by minors in 1 (0.7%) and tobacco products sale to minors in 58 (40%) amongst those 145 tobacco PoSs. Illustrative photographs of COTPA violation section 4 and 6b has been captured in Figure 2 and 3 respectively.

Display of “No smoking signage” in the educational institutions were not complying with the guidelines provided under COTPA as shown in Figure 2 A and B.

Sale of tobacco products within a radius of 100 of educational institution as shown in Figure 3 A and B.

**Figure 2 (A and B): Illustrative photographs of violations of COTPA section 4.****Figure 3 (A and B): Illustrative photographs of COTPA violation section 6b.**

Compliance to COTPA section 6b found in 155 (51.7%) educational institutions. Among the remaining 145 (48.3%) institutions which violated section 6b, nearest tobacco PoS located beyond 100 meters radius of each institution identified using google map. Approximate distance calculated and median distance of those PoS was found to be 386.45 (300-400) meters (Figure 4).

**Figure 4: Box and Whisker plot depicting the distance of the nearest tobacco PoS located beyond 100 meters radius of educational institutions, (n=145).**

It was observed that only 32 (10.7%) educational institutions complied to statutory display of “No smoking signage” board at the entrance of the educational institutions as per COTPA section 4. Amongst those 32, only one (3.12%) educational institution did not prominently display the “No smoking signage” board but in more than half of the institutions, 17 (53.1%) non-compliance to the mandated dimensions of the signage board was recorded. Moreover, none of the 32 institutions have mentioned in the signage board about the concerned authority whom to complaint if section 4 is being violated. Among all the 300 educational institutions

observed, active smoking was noticed within 100 meters radius in nearly half of the institutions i.e., 133 (44.3%).

In bivariate analysis, violation of COTPA was assessed with type and locality of educational institutions as given in Table 3. Government or government-aided educational institutions had 1.85 times violated COTPA section 6b (prohibition of sale of tobacco products within 100 meters radius of educational institutions), when compared with private institutions and it was found to be statistically significant (95% CI: 1.17-2.93; $p=0.008$). Similarly, schools had 2.23 times violated COTPA section 6b when compared with colleges and it was found to be statistically significant (95% CI: 1.27-3.97; $p=0.004$).

As for as COTPA sec 4 (prohibition of smoking in public places—within 100 meters radius of educational institutions), government or aided educational institutions had 2.07 times violated sec 4 when compared with the private institutions with statistical significance (95% CI: 1.30-3.30; $p=0.002$). While schools had 3.07 times violated section 4 when compared with the colleges (95% CI: 1.69-5.75; $p=0.001$) with statistical significance. However, for statutory display of “No smoking” signage it noticed that there was no significant association found with type and locality of educational institutions.

Table 2: Violation of COTPA section 6a and 6b (n=300).

Violation of COTPA section		N (%)
COTPA violation of section 6b		
Presence of tobacco PoS within 100 meters of educational institution	Yes	145 (48.3)
	No	155 (51.7)
Tobacco PoS, (n=145)		
Number of PoS within 100 meters of educational institution	1-3	140 (96.6)
	4-6	5 (3.4)
Type of tobacco PoS within 100 meters of educational institution	Permanent kiosk	107 (73.8)
	Permanent shops	37 (25.5)
	Temporary kiosk	1 (0.7)
COTPA violation of section 6a		
Tobacco sold by minors within 100 meters of educational institution	Yes	1 (0.7)
	No	144 (99.3)
Tobacco sold to minors within 100 meters of educational institution	Yes	58 (40)
	No	87 (60)

Table 3: Factors associated with the violation of COTPA around educational institutions (n=300).

COTPA section 6a violation	Govt EI N (%)	Private EI N (%)	P value	Odds ratio (CI)
Presence of “no smoking signage”				
Yes	21 (14.2)	11 (7.2)	0.051	2.11 (0.98-4.71)
No	127 (85.8)	141 (92.8)		
Presence of tobacco PoS within 100 meters of EI				
Yes	83 (56.1)	62 (40.8)	0.008*	1.85 (1.17-2.93)
No	65 (43.9)	90 (59.2)		
Active smoking seen within 100 meters of EI				
Yes	79 (53.4)	54 (35.5)	0.002*	2.07 (1.30-3.30)
No	69 (46.6)	98 (64.5)		
Presence of “no smoking signage”				
	Urban EI, N (%)	Rural EI, N (%)	0.250	1.53 (0.73-3.27)
Yes	18 (12.9)	14 (8.8)		
No	122 (87.1)	146 (91.3)		
Presence of tobacco PoS within 100 meters of EI				
Yes	70 (50.0)	75 (46.9)	0.589	0.88 (0.55-1.39)
No	70 (50.0)	85 (53.1)		
Active smoking seen within 100 meters of EI				
Yes	67 (47.9)	66 (41.3)	0.250	1.30 (0.82-2.06)
No	73 (52.1)	94 (58.8)		
Presence of “no smoking signage”				
	Schools, N (%)	Colleges, N (%)	0.873	1.07 (0.45-2.79)
Yes	25 (10.8)	7 (10.1)		
No	206 (89.2)	62 (89.9)		
Presence of tobacco PoS within 100 meters of EI				
Yes	122 (52.8)	23 (33.3)	0.004*	2.23 (1.27-3.97)
No	109 (47.2)	46 (66.7)		
Active smoking seen within 100 meters of EI				
Yes	116 (50.2)	17 (24.6)	0.001*	3.07 (1.69-5.75)
No	115 (49.8)	52 (75.4)		

*Chi-square test applied ($p<0.01$ considered as statistically significant), # EI-Educational institution, PoS-Point of sale.

DISCUSSION

The current observational, cross-sectional survey revealed a bleak picture regarding the implementation of COTPA in Puducherry, South India. Though strict anti-tobacco regulations and penalties for violations was introduced under COTPA in 2003 in India, due to poor enforcement, frequent COTPA law infringements are being witnessed.

Nearly half of the educational institutions, 48.3% violated section 6b (No person shall sell, offer for sale, or permit sale of, cigarette or any other tobacco product in an area within a radius of 100 yards of any educational institutions). Earlier studies had reported that 69.3% and 76% of educational institutions violated section 6b in metropolitan cities like Chennai and Bengaluru respectively.^{11,12} The differences in the proportion of COTPA violation of section 6b could be attributed to the study settings and time period of research.

In the present survey, out of 145 educational institutions having tobacco PoS within 100 meters radius, 96.6% of institutions had 1-3 PoS while 3.4% had 4-6 PoS. Similar findings were documented in a study conducted in Bengaluru, Karnataka by Khargekar et al.¹² Similar findings were reported in a study from the capital city, New Delhi, India. In addition, it was mentioned that there were no tobacco selling outlet displaying board for prohibition of tobacco products sale to minors.¹³ Moreover, in a study by Elf et al from Ahmedabad, Gujarat had published that tobacco advertisement in violation of COTPA was found around 57% of schools were found to have tobacco advertising that was against the law, 83% of schools had tobacco product displays.¹⁴

Violation of COTPA section 6a was observed in the form of tobacco products sale by minors in 1 (0.7%) and tobacco products sale to minors in 58 (40%) amongst those 145 tobacco PoSs identified within 100 meters radius of educational institutions in this survey. In contrast to these findings, a study by Aggarwal et al from Uttarakhand had cited that around 20% of the tobacco vendors had violated COTPA section 6a.¹⁵ The variations in the results could be because of the inclusion criteria applied for selection of tobacco PoS.

Out of 300, only 32 (10.7%) educational institutions complied to statutory display of "No smoking signage" board at the entrance of the educational institutions as per COTPA section 4. In contrast, an observational study done among 307 schools and colleges selected across 5 states in India had revealed that 69% of the educational institutions violated COTPA section 4 (mandatory display of "No smoking" signage at the entrance or walls of the educational institutions as mentioned in COTPA).¹⁶

In the present survey, active smoking was noticed within 100 meters radius in early half of the educational institutions (44.3%). Whereas a study from Chandigarh, North India showed that active smoking was noticed

within 100 meters radius of educational institutions in 19.5%. Also, it was reported that, 27.3% of educational institutions were having recent tobacco smell around them.¹⁷ The differences in findings could be attributed to the study setting, time and duration of observation.

This survey had certain limitations. Study was confined to only two sections of the COTPA (Sections 4 and 6). The smokeless forms of tobacco were not assessed under the COTPA violation in this study. Educational institutions and PoS were observed during evenings (3:00 pm to 5:00 pm) for about 30 min, which may not record various violations of COTPA all through the day, especially sale to and by minors. The strengths of this study were adequate sample size of 300 educational institutions (including schools and colleges) as well as considering both urban and rural institutes, thus providing results that can be generalizable. Also, this study has been one of its kind for assessment of COTPA implementation with prime focus on educational institutions in Puducherry.

CONCLUSION

This cross-sectional observational study demonstrated lax implementation of COTPA (Sections 4 and 6) around educational institutions in Puducherry. The results of this survey will aid the competent authorities and others who are striving for better COTPA implementation. Complying to the tobacco-free educational institutions, we can offer a holistic approach to tobacco control especially for adolescents and teenagers. Awareness generation about COTPA must be done among students, teachers, law enforcement officials, and the community members. Also, proper measures must be taken to guarantee their adherence to the law. To enable governing bodies to implement COTPA in letter and spirit for ultimate control of tobacco use, regular and periodic surveys are recommended and indispensable.

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

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