Tobacco Point-of-Purchase Marketing in School Neighbourhoods and School Smoking Prevalence

A Descriptive Study

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ABSTRACT

Background: Point of Purchase (PoP) promotional and advertising activities are a sophisticated tobacco marketing strategy. This study describes tobacco PoP activities in school neighbourhoods and compares PoP activities in retail stores between schools with high and low smoking prevalence.

Methods: A cross-sectional study was conducted in 81 randomly selected schools across five provinces. Students in grades 10-11 completed a questionnaire on smoking. Observations were made in all retail stores located within a one-kilometre radius around the school. ANOVA tests were used to detect differences on PoP variables between high (>20.6%) and low (≤20.6%) smoking prevalence schools, defined as percentage of students reporting at least a few puffs on >2 days in the last 30 days.

Results: Approximately half of retail stores in each school neighbourhood exhibited tobacco PoP activities. Average school smoking prevalence was 20.99%. There were significant main effects on PoP variables between schools with high and low smoking prevalence, Wilk's λ =0.81, F (6,74)=2.89, p<0.01, η^2 =0.19. Stores near schools with high smoking prevalence had significantly lower prices per cigarette (F (1,79)=15.34, p<0.01, η^2 =0.16), more in-store promotions (F (1,79)=6.73, p<0.01, η^2 =0.08), and fewer government-sponsored health warnings (F (1,79)= 6.26, p<0.01, η^2 =0.07) compared to schools with low smoking prevalence.

Conclusion: Higher levels of PoP activities in stores located in the school neighbourhood are related to school smoking prevalence. Schools with low smoking prevalence had more stores that posted government health warning signs and higher cigarette prices. Legislation regulating PoP activities and health warnings in school neighbourhoods should be considered.

MeSH terms: Tobacco; marketing; adolescent

La traduction du résumé se trouve à la fin de l'article.

obacco advertising and promotion are believed to motivate adolescent experimentation and maintenance of tobacco use through shaping positive attitudes and beliefs about smoking.^{1,2} The literature consistently demonstrates that adolescents are vulnerable to tobacco advertising, making them the primary market for tobacco companies.^{1,3-6} Furthermore, three out of four adolescents visit retail shops at least once a week, making the retail store a powerful venue where they can be routinely exposed to Point-of-Purchase (PoP) marketing.7

Retail stores are believed to be the major communication channel between tobacco companies and their present and future customers. The largest portion of US tobacco companies' marketing dollars are currently being spent on retail PoP promotional and advertising activities.8 PoP is a sophisticated marketing strategy designed to offset the possible beneficial effects of tax increases and policies restricting tobacco advertising.9-12 Increased levels of tobacco promotions and advertising in retail stores were documented following implementation of the 1998 US Master Settlement Agreement which increased tobacco advertising restrictions.¹³⁻¹⁵ There is no similar published evidence to report based on the Canadian context.

The literature on tobacco PoP activities and youth smoking is mainly descriptive. Studies describing tobacco PoP activities in US retail environments reported higher tobacco marketing activities in retail stores which were more frequently visited by adolescents compared to less often frequented stores within the same community.^{3,16} More tobacco advertisements were reported in stores located near schools, and in lower-income communities.¹⁷⁻²¹ Additional studies suggested that retail tobacco advertising activities are strategically positioned where young people are most likely to see them.^{22,23}

The retail environment exerts a unique influence in promoting smoking as a desirable social norm. Specifically, it serves many traditional advertising functions including brand promotion, creating positive brand image, and encouraging maintenance or reuptake of daily smoking together in one context.24-26 A study examining the effects of youth exposure to retail tobacco advertising found that students exposed to pictures of tobacco-saturated

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stores perceived significantly easier access to cigarettes, believed more peers tried and approved of smoking, and expressed weaker support for tobacco-control policies than did a comparison group.²⁷

Some research has examined the relationship between exposure to PoP marketing and youth knowledge and attitudes towards smoking. There is evidence that young smokers are more familiar with cigarette advertisements and prefer the most heavily advertised brands in the convenience stores near their schools.^{25,28} In addition, greater intentions to smoke by youth have been associated with increased exposure to and knowledge of cigarette advertising.²⁹⁻³¹ However, there is a lack of information regarding retail PoP activities near Canadian schools, and limited studies have examined the relationship between PoP marketing and school smoking rates. The purpose of this study was to examine PoP activities in Canadian secondary school neighbourhoods by: 1) describing the prevalence of retail tobacco PoP activities, and 2) comparing the prevalence of tobacco PoP activities in retail stores between schools with high and low smoking rates.

METHODS

Participants

A multi-site cross-sectional study was conducted with all students in grades 10-11 (n=22,318) within 81 randomly selected secondary schools from British Columbia, Manitoba, Newfoundland, Ontario, and Quebec. Within these five provinces, cluster sampling was used to select a random sample of municipalities from which to randomly select school boards/districts and then schools. The five provinces represent a geographical balance with smoking rates that span the range of Canada's overall smoking rate for youth aged 15-19 years.³²

Procedures

Ethical approval was obtained from the University of British Columbia Behavioural Research Ethics Board along with further approval from collaborating institutions and school boards across study sites. Passive parental consent approach was used for this study. Student tobacco data collection materials, including information for parents, student surveys and teacher instructions for the delivery of the surveys, were distributed prior to the data collection. Teachers administered the student surveys during a regularly scheduled class. To ensure confidentiality, each student was asked to seal their completed survey in a provided envelope, which was collected by the teacher and returned to the school's main office. During survey administration, researchers were available to answer questions and collect survey packages as they were returned.

Observational data on characteristics of the retail environment in the surrounding neighbourhoods of all 81 schools were also collected. Store observations were made in all retail stores that were located within a one-kilometre radius around each school. This radius, operationalized as the school neighbourhood, was determined to be both representative of an area through which a student might reasonably walk from the school during the day, and practical for purposes of data collection. Data collector training for store observations included an extensive review of the instrument, slide shows of tobacco products, advertisements, promotions and retailer signage. In addition, a half day was spent in the field practising store observations in retail stores.

Data collectors were instructed to drive all streets within that one-kilometre radius and enumerate the tobacco retailers. Following the counts, two data collectors entered each store and acted as customers by looking around and purchasing a small item (\$1 or less). They did not take notes or complete the observation form until they left the store. In the event that the store clerk inquired what they were doing, the data collectors explained the purpose of their visit and provided a letter summarizing the project. In only one case was a data collector queried by a store clerk. Data collectors completed the observation forms independently and, in the event of a disagreement, they returned to the store to verify the observation. In this way, the two-person data collection team served as a reliability check.

Measures

Retail Point-of-Purchase Data The reliable and valid Store Observation Instrument³³ was used to collect retail PoP

data. The original instrument includes items related to tobacco, beer, and malt liquor, of which only the tobacco-related items were used in this study. For the current study, minor revisions were made in consultation with the developers, including the addition of items on tobacco control signage and power wall displays. Therefore, the final instrument comprised 20 items measuring characteristics of the store and items related to tobacco PoP marketing activities including tobacco promotions, advertisements, power wall displays, cigarette prices, and government-sponsored health warning signs. Table I provides operational definitions of the items.

Store Density Observations

Data collectors enumerated the retail establishments within a one-kilometre radius around each school. The density of stores selling tobacco was calculated as the total number of retail stores that sold tobacco products in the school neighbourhood.

School Smoking Prevalence

School smoking prevalence was obtained using the Tobacco module of the School Health Action, Planning and Evaluation System (SHAPES), which is a reliable and valid self-report school-based survey that captures students' perceptions, attitudes, knowledge, and smoking behaviours.34 Questions pertaining to frequency and quantity of tobacco consumption were used to operationalize smoking behaviour. A smoker was defined as an adolescent who had smoked at least a few puffs of a cigarette on 2 or more days in the last month, thus capturing both experimental and daily smokers. All individuals who met these criteria were dummy coded as "1" while all other students were coded "0". A school smoking prevalence was calculated by adding the number of smokers at each school divided by the total number of student participants at the school. The median smoking prevalence was then computed and used to divide the schools into high and low smoking prevalence groups (i.e., median split).

Data analysis

All variables were continuous and aggregated to the school level, thereby linking school smoking prevalence to the store

TABLE I

Variable In-store Promotion	Definition A variety of techniques used to lure or attract people to purchase tobacco products (e.g., multi-pack discounts that may be noted as "two for the price of one" signs in the retail store; special price offers; bonus offers such as offering extra packs in a carton, bonus loose tobacco tin with purchase of other tobacco products).	Measure What types of promotions were observed inside the store? (Code all that apply) 01 No promotions 02 Multi-pack discounts 03 Cents-off coupon offer 04 Advertising special price offer 05 Free gift(s) with purchase 06 Bonus offer (e.g., extra cigarettes	Variable Construction Number of stores with any in-store promotions in each school neighbourhood divided by the total number of stores in each neighbourhood (store density).
Price per Cigarette	The retail price reflects the dealers' cost, profit, and federal and provincial taxes. ²⁶ In this study, we recorded prices for <i>du Maurier, Players,</i> lowest price cigarette, most prominent international brand, and most prominent cartons displayed.	Data collectors coded size of pack and price with and without tax for the following: 01 <i>du Maurier</i> pack 02 <i>Players</i> pack 03 Lowest price cigarette 04 Prominent international brand pack 05 Carton	Price of cigarettes with tax was first averaged across all the prices recorded for each brand, then converted to unit price per cigarette in dollars in order to ensure price consistency between the 20- and 25-pack sizes. Missing prices were replaced with the provincial average unit prices.
Tobacco Advertising	Any activity or display to promote and sell tobacco products, including any message relating to the sale of any tobacco product or brand of product. Refers to both specific and general advertising. Specific advertising includes any materials that contain a brand logo or use brand colours to attract attention to a particular brand (e.g., sign, notice, fixture, fitting or accessory that makes reference to tobacco). General advertising refers to signs advertising the general price of cigarettes, or that the store sells cigarettes. Does not include tobacco-sponsored shelving/cabinet or Plexiglas displays.	 Is there external advertising of tobacco? 01 Yes, by specific tobacco brands 02 Yes, but not by specific brands 03 No, none visible Select the best statement regarding tobacco ads in the store interior: 01 Free from any ads/logos 02 Some ads/logos, but only in areas where items are displayed 03 Ads/logos are in areas where items are displayed and other areas as well 04 Ads/logos cover almost all available space. 	Number of stores with any interior or external advertisements in each school neighbourhood divided by store density.
Tobacco Power Wall Displays	Shelving/cabinet units located behind the cash register. Such units are built specifically for tobacco products and endorsed by specific tobacco companies or brands.	 How are tobacco products displayed in the store? (code all that apply) 01 Purpose-built display cabinet for tobacco products only 02 Purpose-built display cabinet for tobacco and non-tobacco products 03 Standard shelving or counter 04 Other Are the following endorsed by tobacco manufacturers? (yes/no) 01 Standard shelving or a counter 03 Dependent of the base of the	Number of stores with purpose-built display cabinets endorsed by tobacco manufacturers for tobacco and non-tobacco products in each school neighbourhood divided by store density.
Government Health Warning Signs	Canadian federal law requires every retailer to post retail signage that selling or giving a tobacco product to a young person is prohibited or that contains a prescribed health message, unless the retailer is exempted by the regulations from requirement to post the signs. This does not include health warnings displayed on tobacco products. The provincial government further regulates the specific size, place and manner in which the warning signs are to be placed in retail stores.	02 Purpose display cabinet Does the store display Government Health warnings? (Yes, prominently; Yes, not prominently; No)	Number of stores with any government warning sign(s) in each school neighbourhood divided by store density.

Definition, Measure, and Variable Construction for Store Observation Items

observation dataset. Descriptive analyses were conducted to present means and standard deviations. Bivariate relationships were assessed using Pearson correlation coefficients. Following tests to assess normality, independence, linearity, equality of variances, and collinearity,³⁵ multivariate ANOVA with follow-up univariate tests were employed to detect main effect differences between high and low smoking prevalence schools.

RESULTS

There were 487 retail stores located in 81 school neighbourhoods. A total of 42

(8.6%) stores were excluded from the analysis due to incomplete data because they were not open on the day of observation (n=7, 16.7%), were out of business (n=11, 26.2%), or did not sell tobacco products (n=24, 57.1%). Only 11 schools (13.6%) did not have any retail stores located within the school neighbourhood.

TABLE II

Descriptive Statistics for Tobacco PoP Variables for Schools with High and Low Smoking Prevalence

	School Smoking Prevalence	Store Density	In-Store Promotions (%)*	Tobacco Advertising (%)	Power Wall Displays (%)	Price per Cigarette (\$)	Government Health Warning Signs (%)*	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
Low†	15.24 (2.55)	5 (5)	35.62 (32.77)	46.07 (37.89)	53.81 (33.99)	0.40 (0.04)	30.04 (41.14)	
High†	26.87 (5.38)	6 (5)	55.51 (36.18)	50.16 (37.13)	63.36 (31.77)	0.35 (0.05)	11.16 (24.55)	
Total	20.99 (7.18)	6 (5)	45.44 (35.71)	48.09 (37.34)	58.53 (33.06)	0.38 (0.05)	20.72 (35.07)	

Note: * high and low smoking groups are significantly different (p<0.05)

† High smoking prevalence schools n=40; Low smoking prevalence schools n=41

Overall, the store density ranged from 0 to 23 stores with an average of 6 stores within each school neighbourhood.

The average school smoking prevalence was 20.99%. The median smoking prevalence was 20.60%, and was used as an indicator to divide the schools into high (>20.60%) and low (<20.60%) smoking prevalence. Table II displays means and standard deviations for tobacco PoP activities in retail stores stratified by high and low smoking prevalence schools and overall. On average, within each school neighbourhood, 3 stores had in-store promotions, 3 stores displayed tobacco advertising on the interior and exterior of the stores, 4 stores exhibited power wall displays, and 1 store exhibited governmentsponsored health warning signs. The average price per cigarette ranged from \$0.28 to \$0.46. The relationships among PoP variables and smoking prevalence are presented in Table III. Many of the variables were significantly, yet weak to moderately, correlated.

The main analyses involved multiple univariate ANOVAs to examine differences between schools with high and low smoking prevalence. There were significant main effects on tobacco PoP variables, Wilk's \u03c0=0.81, F (6,74) =2.89, p<0.01, η^2 =0.19. Follow-up univariate analyses demonstrated that schools with high smoking prevalence were in neighbourhoods that had significantly lower price per cigarette (F (1,79)=15.34, p<0.01, η^2 =0.16), more in-store promotions (F (1,79)=6.73, p<0.01, η^2 =0.08), and fewer governmentsponsored health warning signs (F (1,79)=6.26, p<0.01, $\eta^2=0.07$) compared to schools with low smoking prevalence.

DISCUSSION

This study explored tobacco PoP activities in school neighbourhoods across five Canadian provinces. The majority of

TABLE III

Pearson Correlations for School Smoking Prevalence and Tobacco PoP Variables

		Pearson Correlations						
Variables	1.	2.	3.	4.	5.	6.	7.	
1. School smoking								
prevalence	-							
2. Store density	0.16	_						
3. In-store promotions	0.34*	0.29*	_					
Tobacco advertising	-0.07	0.07	0.27*	_				
5. Power wall displays	0.09	0.20	0.67*	0.56*	-			
6. Price per cigarette	-0.43*	-0.11	-0.49*	-0.14	-0.25*	_		
Government health								
warning signage	-0.30*	-0.02	-0.21	0.16	0.04	0.37*	-	

* significant at p<0.05 (2-tailed)

retailers located within the school neighbourhood sold tobacco products. Approximately half of these retailers exhibited tobacco PoP promotional and advertising activities. Only a few stores had government-sponsored health warning signs.

By linking observational data with individual smoking behaviour aggregated at the school level, this study provides evidence that the presence of tobacco PoP activities varies between neighbourhoods with high and low levels of school smoking prevalence. Schools with a smoking prevalence greater than 20.6% had more neighbourhood stores with in-store tobacco promotions and access to lower prices on cigarettes. This finding is consistent with prior research,13,36-39 yet unique to the Canadian context, and suggests that in-store promotions and lower pricing are powerful industry marketing strategies influencing school smoking norms. In fact, price has been identified as the single most effective way to reduce youth smoking "quickly and substantially".40 Furthermore, price-subsidizing promotional activities by the tobacco industry are sufficient to overcome the documented effect of higher prices in discouraging adolescents from becoming regular smokers.41

It was also observed that schools with a lower smoking prevalence had more stores in the neighbourhood that posted government health warning signs about smoking. At the federal level, posting of government health warning signs are optional but not required. However, based on these findings, warning signs would be a valuable contribution to tobacco control, particularly in stores situated in school neighbourhoods.

The results of this study are limited by sample size and a cross-sectional design. While the descriptive nature of results provides insight into the extent and possible influence of PoP activities, inferences regarding the direct impact of these activities on school smoking prevalence cannot be determined. At the time of data collection, there were few regulations on PoP activities in Canada. Since that time, five provinces and one territory have adopted laws to prohibit the physical display of tobacco products at Point-of-Purchase, with three additional provinces scheduled to implement similar legislation within the next two years. Further research, particularly longitudinal studies, are needed to determine how these changes will impact youth smoking prevalence.

Different jurisdictional power exists among provincial and municipal authorities on tobacco control policy development, implementation and enforcement,⁴² and the observed variability in smoking behaviour and PoP factors may reflect contextual factors such as programming and legislation. For example, a positive association between price and government health warnings was observed, suggesting the community may have a strong comprehensive tobacco control program. Sample size limitations do not permit further exploration of these questions. To further explore regional variations, a larger sample and more information regarding the community context is needed.

In spite of the limitations, the strength of this research is in highlighting the relationship between increased PoP activities in retail stores in the school neighbourhood and school smoking prevalence. This suggests that PoP activities contribute to an environment that promotes student smoking. Schools should be encouraged to work with retailers in their area with regard to the posting of health warnings and to support reduced access to tobacco. Legislators should consider stronger regulations that eliminate PoP advertising or prohibit the sale of tobacco in school neighbourhoods. Future research should consider the presence of school programs and policies that could influence smoking prevalence, as well as community variables. The association between the presence of community tobacco control activities and level of PoP activities should also be examined.

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RÉSUMÉ

Contexte : L'une des stratégies les plus subtiles des compagnies de tabac consiste à promouvoir et à publiciser la cigarette sur le lieu de vente. Cette étude porte sur les activités de promotion du tabac sur le lieu de vente dans les quartiers où l'on trouve des écoles; ces activités sont ensuite comparées dans les magasins de détail proches d'écoles où la prévalence du tabagisme est soit faible, soit forte.

Méthode : Une étude transversale a été menée dans 81 écoles sélectionnées au hasard dans cinq provinces. Les élèves de 10° et de 11° année ont rempli un questionnaire sur le tabagisme. Tous les magasins de détail situés dans un rayon d'un kilomètre de chaque école ont aussi été visités. Des analyses de la variance ont permis de déceler les écarts, attribuables à la promotion sur le lieu de vente, entre les écoles à forte (>20,6 %) et à faible (≤20,6 %) prévalence de tabagisme, cette prévalence étant définie comme le pourcentage d'élèves disant avoir tiré au moins quelques bouffées de cigarette au cours de trois ou plus des 30 jours précédents.

Résultats : La présence d'activités de promotion du tabac sur le lieu de vente a été observée dans environ la moitié des magasins de détail de chaque quartier scolaire. La prévalence moyenne du tabagisme dans les écoles était de 20,99 %. La prévalence du tabagisme à l'école était significativement liée aux variables de promotion du tabac sur le lieu de vente (lambda de Wilk=0,81, rapport F [6,74]=2,89, p<0,01, η^2 =0,19). Dans les magasins proches d'écoles à forte prévalence de tabagisme, le prix par cigarette était significativement plus bas (F [1,79]=15,34, p<0,01, η^2 =0,16), les publicités internes étaient plus nombreuses (F [1,79]=6,73, p<0,01, η^2 =0,08), et les mises en garde gouvernementales sur les effets néfastes du tabac étaient moins nombreuses (F [1,79]=6,26, p<0,01, η^2 =0,07) que dans les magasins proches d'écoles à faible prévalence de tabagisme.

Conclusion : Il existe un lien entre les niveaux élevés d'activité promotionnelle sur le lieu de vente dans les magasins situés dans les quartiers scolaires et la prévalence du tabagisme à l'école. Les écoles à faible prévalence de tabagisme sont situées près de magasins affichant des mises en garde gouvernementales et vendant les cigarettes plus cher. Dans les quartiers où l'on trouve des écoles, il faudrait donc envisager une réglementation plus stricte des activités promotionnelles sur le lieu de vente, ainsi que l'affichage de mises en garde sur les effets néfastes du tabac.

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Coming Events / Activités à venir

To be assured of publication in the next issue, announcements should be received by **July 31, 2007** and valid as of **August 31, 2007**. Announcements received after **July 31, 2007** will be inserted as time and space permit. Pour être publiés dans le prochain numéro, les avis doivent parvenir à la rédaction avant le **31 juillet 2007** et être valables à compter

du **31 août 2007.** Les avis reçus après le **31 juillet 2007** seront insérés si le temps et l'espace le permettent.

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Forum 11

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74th Annual Educational Conference of the Canadian Institute of Public Health Inspectors (CIPHI) 20-23 July 2008 St. John's, NL Contact: www.ciphi.ca/events.htm

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