

## RESEARCH COMMUNICATION

# The Relationship Between Tobacco Advertisements and Smoking Status of Youth in India

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## Abstract

**Objective:** To examine the relationship between tobacco advertisements, counter-advertisements, and smoking status among Indian youth. **Materials and Methods:** Global Youth Tobacco Survey (GYTS) data was used; the data encompassed a representative two-stage probability sample of 60,001 students aged 13–15 years in 24 states in India. These students were interviewed with an anonymous, self-administered questionnaire. Binary logistic regression analyses were performed with smoking status as the dependent variable, and exposure to cigarette advertisements or counter-advertisements as independent variables. **Results:** Students watching anti-smoking media messages were less likely to be current smokers, which was true for both boys [OR = 0.89, 95% CI (0.81–0.98)] and girls [OR = 0.79, 95% CI (0.69–0.90)]. This relationship was stronger among past smokers for boys [OR = 0.56, 95% CI (0.52–0.60)] and girls [OR = 0.49, 95% CI (0.45–0.53)]. On the other hand, students who were exposed to cigarette brand names during sports events and other televised programs, newspapers or magazines, and being offered free cigarette or cigarette-branded merchandise promotions were significantly more likely to be smokers, with effects ranging from moderate (OR=1.19) to very strong (OR=3.83). **Conclusions:** This is the first attempt from India to investigate the relationship between smoking and advertising. When the data were collected, cigarette advertising was legal and highly correlated with smoking behavior. Today, indirect surrogate advertising still exists; future research should examine its effect, as it is likely to have the same impact as direct advertising on smoking behavior. Finally, counter-advertising has a protective effect on youth and may function as a cessation aid.

**Key Words:** Advertising - smoking - young people - India

*Asian Pacific J Cancer Prev*, 9, 637-642

## Introduction

There are 1.3 billion smokers worldwide and half of them will die of smoking-related diseases (WHO, 2007). This epidemic is increasingly burdening the developing world. It is predicted that by 2030, 70% of tobacco-related deaths will occur in low and middle-income countries (World Bank, 2009). The problem is of particular concern in India, where tobacco-related mortality is among the highest in the world. According to the current data, 47% of the Indian males and 14% of the Indian females are current tobacco users, resulting in 13.3% of total deaths due to tobacco by 2020 (Reddy and Gupta eds. 2004). One possible explanation for the high prevalence of tobacco use is advertising; however, there is considerable ambiguity regarding the research findings. Although some research demonstrates that tobacco advertisements encourage non-smokers, especially youth, to begin smoking, others have reported that advertising has no effect on tobacco consumption (Saffer and Chaloupka, 2006; Wellman et al., 2006).

Counter-advertising—direct opposition to the advertising messages sent out by the tobacco industry—

has proven effective in reducing tobacco consumption. We can learn about effective counter-marketing through an understanding of industry advertising, since both attempt to appeal to the same audiences and modify existing beliefs regarding smoking through similar mechanisms (i.e., modifying beliefs about social acceptability of smoking and the image of a smoker). In a review, Agostinelli and Grube (2003) reported that counter-advertisements focused on normative beliefs and messages of smoker rejection and nonsmoker acceptance effectively countered the industry's social "glamorization" of smoking.

To our knowledge, there is no evidence regarding tobacco advertising and its impact on youth in India. In this study, we will analyze the data obtained from the Global Youth Tobacco Survey (GYTS) questionnaire to examine the association between tobacco advertising and counter-advertising and smoking status.

## Materials and Methods

GYTS is a school-based survey that is administered worldwide to 13-15-year-old children. It was designed to

standardize and enhance monitoring and surveillance of tobacco use and guide implementation and evaluation of tobacco control programs. The questionnaire comprises 56 "core" questions and allows each country the freedom to include country-specific questions. In India, several questions were included regarding bidi smoking and the use of various forms of smokeless tobacco. Questions can be categorized into the following seven domains: (1) Knowledge and attitudes of young people towards cigarette smoking; (2) Prevalence of cigarette smoking and other tobacco use among young people; (3) Role of the media and advertising in young people's use of cigarettes; (4) Access to cigarettes; (5) Tobacco-related school curriculum; (6) Environmental tobacco smoke (ETS); and (7) Cessation of cigarette smoking (WHO, 2007).

In India, GYTS data were collected between 2000 and 2003 from 24 States and 2 Union territories. To ensure complete representation, investigators obtained a list of all schools with grades 8-10 (corresponding grade for 13-15 year old children in India). A two-stage cluster sample design was used to obtain a representative sample. At the first stage, schools were selected with a probability proportional to the enrolment size. At the second stage, the classes were selected by systematic sampling with a random start. The questionnaire was self-administered and anonymous; no personal information was collected, and the answers were recorded on an optically readable answer sheet.

Questions 1 and 2 in Table 1 were used to define smoking status. Participants reporting "0 days" of smoking in the last 30 days were defined as non-current smokers, and all others were coded as current smokers. Of the non-current smokers, those responding "yes" for the first

question were coded as past smokers (this may also include past tobacco users), and those responding "no" were coded as never tobacco users.

In this study, we focused on the advertisement-related questions in Table 1. Several questions were specific to the consumption of bidis, a type of smoked tobacco that is popular in India. Bidis are handmade by rolling approximately 0.25 grams of flake form of tobacco in a rectangular piece of a dried tambourine "diaspyrus melanoxylon" into a rough conical shape.

### Statistical Analysis

Two separate binary logistic regression analyses were performed using SPSS, with smoking status as the dependent variable. The first analysis compared data between current smokers and never tobacco users; and the second compared data between past smokers and never tobacco users. The reference category in questions 3-11 above was the first response option, not/never seen anti-smoking messages/advertisements, and the reference category for the Yes/No questions was "no". The odds ratios were adjusted for age and state prevalence. Separate analyses were conducted for boys and girls.

### Results

Data from 22 States and 2 Union territories was analyzed. We excluded the states of West Bengal and Tamilnadu from the analyses because the appropriate information was not available. The median response rate for students was 84.5% with a range of 70.1% (Bihar) to 94.6% (Gujarat). The median response rate for schools was 100%, with a range of 92.0% (Tripura and Punjab) to 100%. Of the sample size of 60,001 participants, 12.9%

**Table 1. GYTS Questions Analyzed and Answer Options**

1	Have you ever tried or experimented with any form of tobacco, even once or twice?	0-No	1-Yes
2	During the past 30 days (one month), on how many days did you smoke tobacco in any form?	0-0 days	1-1 or 2 days
		2-3 to 5 days	3- 6 to 9 days
		4-20 to 29 days	5-All 30 days
3	During the past 30 days (one month), how many anti-smoking media messages (e.g. television, radio, billboards, posters, newspapers, magazines, movies, drama) have you seen?	0-not seen anti-smoking messages	1-seen them
4	When you go to sports events, fairs, concerts, poojas, weekly markets, community events, or social gatherings, how often do you see anti-smoking messages?	0-not seen anti-smoking messages	1-seen them
		2-never go to events	
5	When you watch TV, videos, or movies, how often do you see actors smoking?	0-never seen	1-seen
		2-never watch T.V., videos or movies.	
6	During the past 30 days (one month), when you watched sports events or other programs on TV how often did you see cigarette brand names?	0-never seen	1-seen
		2-never watch T.V.	
7	During the past 30 days (one month), how many advertisements for cigarettes have you seen on hoardings, buses, bus-stops, trains, railway platforms, shops or as writings on walls?	0-not seen advertisements	1-seen them
8	During the past 30 days (one month), how many advertisements for bidis have you seen on hoardings, buses, bus-stops, trains, railway platforms, shops or as writings on walls?	0-not seen advertisements	1-seen them
9	During the past 30 days (one month), how many advertisements, quizzes, contests or promotions for cigarettes have you seen in newspapers or magazines?	0-not seen advertisements	1-seen them
10	When you go to sports events, fairs, concerts, or community events, poojas or weekly market how often do you see advertisements for cigarettes?	0-not seen advertisements	1-seen them
		2-never go to events	
11	When you go to sports events, fairs, concerts, or community events, poojas or weekly market how often do you see advertisements for bidis?	0-not seen advertisements	1-seen them
		2-never go to events	
12	Has a cigarette company person or cigarette vendor ever offered you a free cigarette?	0-No	1-Yes
13	Has a bidi company person or bidi vendor ever offered you a free bidi?	0-No	1-Yes
14	Do you have something (t-shirt, pen, backpack, shopping bag, cap etc.) with a cigarette brand name or cigarette symbol on it?	0-No	1-Yes
15	Do you have something (t-shirt, pen, backpack, shopping bag, cap etc.) with a bidi or pan masala brand name or symbol on it?	0-No	1-Yes

**Table 2. Demographics of the Subjects**

Age	≤11-y-old	2,458	4.2
	12-y-old	8,899	15.1
	13-y-old	15,691	26.6
	14-y-old	15,944	27.0
	15-y-old	11,175	18.9
	16-y-old	3,752	6.4
	≥17-y-old	1,122	1.9
	Gender	Male	34,119
Female		24,757	42.0
School level	7th standard	14,953	25.2
	8th standard	19,399	32.7
	9th standard	19,214	32.4
	10th standard	5,669	9.6
State/Territory	Andhra Pradesh	2,462	4.1
	Arunachal Pradesh	2,314	3.9
	Assam	2,177	3.6
	Bihar	2,636	4.4
	Chandigarh	2,129	3.5
	Delhi	1,731	2.9
	Goa	2,256	3.8
	Gujarat	1,637	2.7
	Haryana	1,759	2.9
	Himachal Pradesh	2,031	3.4
	Karnataka	4,110	6.8
	Madhya Pradesh	1,692	2.8
	Maharashtra	2,356	3.9
	Manipur	1,743	2.9
	Meghalaya	2,080	3.5
	Mizoram	2,295	3.8
	Nagaland	2,221	3.7
	Orissa	2,913	4.9
	Punjab	2,014	3.4
	Rajasthan	6,160	10.3
Sikkim	2,236	3.7	
Tripur	1,866	3.1	
Uttar Pradesh	4,542	7.6	
Uttaranchal	2,641	4.4	

were current smokers, 21.9% were past smokers, and 65.1% were never tobacco users.

Exposure to anti-smoking media campaigns had a protective effect. The odds of a student to be a smoker were significantly lower if they were exposed to anti-smoking media messages through television, radio, billboards, posters, newspapers, magazines, movies, and drama over the past 30 days [OR = 0.89, 95% CI (0.81–0.98) for boys and OR = 0.79, (0.69–0.90) for girls]. Exposure to cigarette brand names on sports events and other televised programs significantly increased the likelihood of smoking in boys [OR = 1.75, 95% CI (1.54–1.99)] and girls [OR = 1.92, 95% CI (1.60–2.30)]. This was also true for exposure to advertisements, quizzes, contests or promotions for cigarettes in newspapers or magazines [OR = 1.37, 95% CI (1.26–1.48) for boys and OR = 1.19, (1.07–1.33) for girls]. The odds ratio of male smokers being offered free cigarettes from a vendor or industry representative was 2.62 [95% CI (2.37–2.89)] compared to that of the corresponding never-smokers. These results were even stronger for girls, as female current smokers were almost four times more likely to have been offered a free cigarette than the corresponding never-smokers, with odds ratio 3.83 [95% CI (3.32–4.41)]. The results were similar for owning something with a

**Table 3. Adjusted Odds Ratios and 95% Confidence Intervals for Current Smokers vs. Never Tobacco Users**

Variable	Boys	Girls
Anti-smoking		
media messages	0.89 (0.81-0.98)	0.79 (0.69-0.90)
Actors smoking	1.20 (1.00-1.44)	0.82 (0.65-1.04)
Cigarette brand names	1.75 (1.54-1.99)	1.92 (1.60-2.30)
Newspapers/magazines	1.37 (1.26-1.48)	1.19 (1.07-1.33)
Free cigarettes	2.62 (2.37-2.89)	3.83 (3.32-4.41)
Free bidis	2.37 (2.13-2.63)	2.85 (2.43-3.34)
Own item with		
cigarette brand name	2.62 (2.39-2.86)	2.62 (2.30-2.99)
Own item with		
bidi brand name	2.58 (2.35-2.82)	2.76 (2.42-3.16)

Values adjusted for age and state

**Table 4. Adjusted Odds Ratios and 95% Confidence Intervals for Past Smokers vs. Never Tobacco Users**

Variable	Boys	Girls
Anti-smoking		
media messages	0.56 (0.52-0.60)	0.49 (0.45-0.53)
Actors smoking	1.54 (1.31-1.82)	1.50 (1.23-1.84)
Cigarette brand names	1.75 (1.58-1.94)	1.76 (1.56-1.98)
Newspapers/magazines	0.99 (0.93-1.05)	0.80 (0.74-0.86)
Free cigarettes	1.38 (1.25-1.51)	1.25 (1.09-1.43)
Free bidis	1.41 (1.29-1.56)	1.28 (1.11-1.48)
Own item with		
cigarette brand name	1.59 (1.47-1.73)	1.66 (1.50-1.84)
Own item with		
bidi brand name	2.37 (2.20-2.56)	2.06 (1.86-2.28)

Values adjusted for age and state

cigarette brand or name on it, with OR 2.62 [95% CI (2.39–2.86)] for boys and 2.62 [95% CI (2.3–2.99)] for girls. Finally, exposure to actors smoking on television was non-significant for boys and girls, with ORs of 1.20 [95% CI (1.00–1.44)] and 0.82 [95% CI (0.65–1.04)] respectively.

Results were similar albeit slightly weaker when smoking status was redefined as past smoker vs. never-tobacco user. However, past smokers were more likely to have been exposed anti-tobacco advertisements than never tobacco users among both boys [OR 0.56, 95% CI (0.52, 0.60)] and girls [OR 0.49, 95% CI (0.45, 0.53)]. Further, exposure to actor smoking was significant during the past smokers vs. never tobacco users analysis [OR = 1.54, 95% CI (1.31–1.82) for boys and OR = 1.50, 95% CI (1.23–1.84) for girls]. Similar associations were found for bidi advertising and promotions (see Tables 3 and 4).

## Discussion

### Counter-advertising

A major finding of this paper is that exposure to the minimal anti-smoking media messages in India appear to be protective against smoking initiation among 13 to 15-year-old boys [OR = 0.89, 95% CI (0.81–0.98)] and girls [OR = 0.79, 95% CI (0.69–0.90)]. Our study findings are consistent with several other research studies regarding the effect of counter-marketing on cigarette consumption in other parts of the world. For example, Sly et al. (2002)

evaluated the Florida Truth campaigns and detected a dose-response relationship between non-smokers' confirmation of counter-advertisements and the odds of remaining a non-smoker at follow-up, supporting many other favorable evaluations of the Truth campaigns (Sly et al., 2002; Niederdeppe et al., 2004; Zucker et al., 2000). Conversely, in a review of tobacco counter-advertisements, Agostinelli and Grube state that it remains unclear whether or not anti-smoking media campaigns have any effect. They assert that although several campaigns have reported favorable findings, including evaluations from Montana, Vermont, and North and South Dakota, results of other evaluation studies are unfavorable, including those from the Minnesota campaign (Agostinelli and Grube, 2003; Murray et al., 1994). This review and many other studies emphasize the need to focus on counter-marketing strategies and attention to message, style, and possible mediators and moderators including dependence on the media for information, presence of other anti-tobacco information, and smoking status of the target audience. Although this study supports the use of counter-advertising campaigns to prevent smoking uptake, this data does not allow us to determine which type of advertisements had the highest impact on specific populations. Future studies should assess the mechanisms of effective counter-advertising in India.

#### *Counter-advertising as a cessation aid*

A few studies have reported a positive relationship between counter-advertising and cessation. For example, Popham et al (1993) found that out of 417 recent quitters, 288 (69%) had seen or heard the mass media tobacco control advertisements, and 143 (34%) reported that these advertisements influenced their decision to quit. Biener et al (2006), who obtained a sub sample of 787 past smokers, found that the anti-tobacco advertisements in Massachusetts prompted approximately one-third of the total respondents and 46% of the youngest study group (ages 18-30) to quit (Biener et al., 2006). Our study corroborates this evidence pointing to counter-advertisements as a cessation aid, as the protective effect of counter-advertising was even higher for past smokers than current smokers, with OR= 0.56 (95% CI 0.52-0.60) for boys and 0.49 (95% CI 0.45-0.53) for girls. This implies that mass-media may also facilitate the quit behavior in Indian children.

#### *Tobacco Advertising*

We found that those who experienced cigarette advertising on televised events, newspapers, and magazines were more likely to be smokers. The ORs for televised events are 1.75 [95% CI (1.54-1.99)] and 1.92 [95% CI 1.60-2.30] for boys and girls, respectively; and 1.37 [95% CI (1.26-1.48)] and 1.19 [95% CI (1.07-1.33)], respectively, for the other advertisements. This supports most global research. A meta-analysis by Wellness et al (2006) evaluated tobacco marketing and media's effect on youth initiation and attitudes. Their data was collated from 51 studies representing 141, 949 participants from 11 different worldwide locations including the United States, Australia, Scotland, England, Norway, Turkey,

Hong Kong, Spain, Gambia, German, and Japan. Overall, the authors found that exposure to marketing and media more than doubled the risk of becoming a tobacco user. Passive exposure, or exposure that did not actively engage the user, increased the odds of tobacco use by about 90%, whereas active exposure, which engaged the user psychologically, increased the odds of tobacco use by 3-fold.

The tobacco industry often attempts to counter such studies by claiming that advertisements do not increase tobacco use, but tobacco users are more likely to view advertisements. However, Wellness et al refutes these claims, citing three experimental studies and 13 prospective studies demonstrating that exposure to advertisements precedes positive attitudes about smoking and doubles initiation of tobacco use.

To our knowledge, this is the first study analyzing the relationship between tobacco advertisements and smoking status among Indian youth. Our findings suggest that the global evidence can be generalized to India, and tobacco advertising in India contributes to smoking in youth. The impact is larger on girls, which is alarming as smoking among women is considered taboo in India. This suggests the tobacco industry is especially successful with changing social norms related to smoking and women in India.

The policy implications of this study are that a comprehensive ban on advertising would reduce initiation of smoking in youth. Shortly after data collection for this study was completed, India passed a law banning tobacco advertising; however, surrogate advertising and product placements still exist. Our study portrays a very strong correlation between smoking and owning something with a cigarette brand name on it, thereby suggesting that advertising of brand names and not necessarily the cigarettes themselves can also lead to smoking behavior. Therefore, it appears that product placement and surrogate advertising also increases smoking behavior among youth. Future policies should work for a comprehensive ban, which includes portrayal of these types of advertisements.

Because we observed similar results for bidi advertising and promotions, our findings also suggest that the bidi industry has learned effective marketing techniques from the cigarette industry. This is surprising as bidi sale is generally seen as a small, local industry without large advertising capabilities. Tobacco control measures in India should attend to this and monitor the growth of bidi advertising and apply all tobacco control policies to bidis in addition to cigarettes and other tobacco products.

Finally, we found that there was no significant correlation between watching actors smoke in movies and smoking status for current smokers vs. never smokers. The data shows a borderline significance for boys, OR=1.20 [95% CI (1.00-1.44)], and non-significance for girls. This is in contradiction to all global studies, which generally indicate a strong correlation (Sargent et al., 2002; Sargent, 2005; Distefan et al., 2006; Gale et al., 2006). For past smokers vs. never smokers, the association was significant for both boys and girls. The implications of this are unclear, and further studies should investigate the relationship between smoking in the movies and smoking

behavior among youth for clarification.

### Limitations

Since this is a cross-sectional study, we cannot assume causation in any direction. Limited to youth ages 13-15, the results of this study cannot be generalized to adults. Further, the questions are not specific enough to help us understand which tobacco industry advertising messages were most effective. Future studies should investigate style, tone, and message of tobacco advertisements to more specifically inform counter-advertising techniques. Although we analyzed a question on anti-tobacco advertising, to our knowledge, these messages are minimal, as no systematic counter-advertising campaigns exist in India. We assume counter-advertisements reflect "no smoking" signs or small, individual NGO efforts. However, the information on the nature of the advertisements is not available from this data; thus, we are not aware of their content.

### Acknowledgements

We would like to acknowledge the various investigators who collected GYTS data, the WHO for funding data collection, the Centers for Disease control for technical support. We also thank biostatistician Radhika Vaidya for conducting the statistical data analysis.

### References

- Agostinelli G, Grube JW (2003). Tobacco counter-advertising: a review of the literature and a conceptual model for understanding effects. *J Health Commun*, **8**, 107-27.
- Biener L, Reimer RL, Wakefield M, et al (2006). Impact of Smoking Cessation Aids and Mass Media Among Recent Quitters. *Am J Prev Med*, **30**, 217-24.
- Distefan JM, Gilpin EA, Sargent JD, et al (1999). Do movie stars encourage adolescents to start smoking? Evidence from California. *Prev Med*, **28**, 1-11.
- Gale J, Fry B, Smith T, et al (2006). Smoking in film in New Zealand: measuring risk exposure. *BMC Public Health*, **6**, 243.
- Murray DM, Prokhorov AV, Harty KC (1994). Effects of a statewide antismoking campaign on mass media messages and smoking beliefs. *Prev Med*, **23**, 54-60.
- Niederdeppe, J, Farrelly, Matthew C, Haviland, ML (2004). Confirming "truth": More evidence of a successful tobacco countermarketing campaign in Florida. *Am J Public Hlth*, **94**, 255-7.
- Popham WJ, Potter LD, Bal DG, Johnson MD, Duerr JM, Quinn V (1993). Do anti-smoking media campaigns help smokers quit? *Public Health Reports*, **108**, 510-3.
- Reddy SK, Gupta PC, eds (2004). Report on Tobacco Control in India. New Delhi: Shree Om Enterprises.
- Saffer H, Chaloupka F (2006). The effect of tobacco advertising bans on tobacco consumption. In 'Robert Wood Johnson Series on Health Policy: Tobacco Control Policy', Eds Isaacs SL, Knickman JR, Warner KE. John Wiley & Sons, Inc, San Francisco pp353.
- Sargent JD (2005). Smoking in movies: Impact on adolescent smoking. *Adolescent Med*, **16**, 345-70.
- Sargent JD, Dalton MA, Beach ML, et al (2002). Viewing tobacco use in movies: does it shape attitudes that mediate adolescent smoking? *Am J Prev Med*, **22**, 137-45.

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- Sly DF, Trapido ED, Ray S (2002). Evidence of the dose effects of an antitobacco counteradvertising campaign. *Prev Med*, **35**, 511-8.
- Wellman RJ, Sugarman DB, DiFranza JR, Winickoff JP (2006). The extent to which tobacco marketing and tobacco use in films contribute to children's use of tobacco: a meta-analysis. *Arch Pediatrics Adolescent Med*, **160**, 1285-96.
- World Bank (1999). Curbing the epidemic: governments and the economies of tobacco control. *Tobacco Control*, **8**, 196-201.
- WHO/CDC Global Youth Tobacco Survey (GYTS). World Health Organization. Available at <http://www.who.int/tobacco/surveillance/gyts/en/index.html>. Accessed March 26, 2007.
- World Health Organization Regional Office for South East Asia (2006). Major Issues and Challenges for Tobacco Control in South-East Asia. Available at <http://www.searo.who.int/EN/Section1174/section1462/default.asp>. Accessed April 25, 2007.
- Zucker D, Hopkins RS, Sly DF, Urich J, Kershaw JM, Solari S (2000). Florida's "truth" campaign: a counter-marketing, anti-tobacco media campaign. *J Public Health Manage Pract*, **6**, 1-6.

