Variables related to smoking initiation among students in public and private high schools in the city of Belém, Brazil*

Denise da Silva Pinto¹, Sandra Aparecida Ribeiro²

Abstract

Objective: To analyze the variables related to smoking initiation among adolescent students in two high schools (one public and one private) in the city of Belém, Brazil, in 2005. Methods: An anonymous self-report questionnaire – comprising 27 closed questions regarding smoking experimentation, smoking habit, access to buying cigarettes, reasons for smoking experimentation, self-perception regarding academic performance, conversations about smoking with the family, and socioeconomic level – was used for data collection. The study comprised 1520 students: 724 (47.6%) from the private school and 796 (52.4%) from the public school. Results: Mean age of participants was 16.5 years. Of the 1520 students evaluated, 669 (44%) reported experimenting with smoking, and 11% smoked regularly. In the public school and the private school, respectively, 51.2% and 36.7% of the participants had experimented with smoking (p = 0); 14.6% and 7%, respectively, were regular smokers (p = 0). We found that, in both schools, the following factors were associated with smoking initiation and current smoking: curiosity, presence of smokers as social contacts, not being praised for not smoking, and perceiving oneself as having poor or mediocre academic performance. Socioeconomic level was found to be associated with experimentation and current smoking only among experimenters of higher socioeconomic classes (A and B) in the private school. Conclusions: Among the students evaluated, the variable most closely associated with smoking was curiosity. Experimentation and regular tobacco use were more common in the public school than in the private school.

Keywords: Smoking; Epidemiologic factors; Students.
The objective of the present study was to analyze the variables related to smoking initiation among adolescent students in two high schools (one public and one private) in the city of Belém. The following associations were established: the influence of parents, siblings and friends who smoke; access to buying cigarettes; self-perception regarding academic performance; conversations about smoking with the family; and socioeconomic level.

**Methods**

A cross-sectional study was conducted in two high schools (one public and one private) located in the same metropolitan area of the city of Belém.

Belém is located in the north of Brazil, and the state of Pará currently comprises 143 cities. The city has a population of 1,280,614 inhabitants, corresponding to approximately 21% of the population of the state. The adolescent population is estimated at 271,933 inhabitants, representing approximately 21.2% of the residents in the city.

The study sample comprised 1520 high school students of up to 19 years of age: 796 (52.4%) from a public school and 724 (47.6%) from a private school. The study period was from August to November of 2005. We excluded 837 students because they did not give written informed consent, were absent from school on the day of the interview or were older than 19 years of age.

For data collection, an individual, anonymous, self-report, standardized questionnaire was used, comprising 27 closed questions regarding smoking experimentation, smoking habit, access to buying cigarettes, reasons for smoking experimentation, presence of smokers as social contacts (parents, siblings and friends), self-perception regarding academic performance, conversations about smoking with the family and socioeconomic level.

The socioeconomic level of students was determined using the Brazilian Economic Classification Criteria established by the National Association of Research Firms, in which data regarding the educational level of the head of the household, the possession of assets and access to various services are cross-referenced. Socioeconomic classes were determined according to the following scores: class A, from 34 to 25 points; class B, from 24 to 15 points; class C, from 14 to 5 points; class D, from 4 to 0 points; and class E, below 0 points.
17 points; class C, from 16 to 11 points, class D, from 10 to 6 points; class E, from 5 to 0 points. This questionnaire was simultaneously filled out by all the students who were present in the school upon our visit, in a collective fashion and without the presence of teachers.

All the students who reported they had smoked at least once in their lifetime were considered experimenters, whereas those who stated that they had been smoking for some time prior to our visit were considered current smokers. The remaining students were considered nonsmokers.

The Ethics in Research Committee of the Federal University of São Paulo approved the study. For the statistical analysis, we used the chi-square test ($\chi^2$) and Student’s t-test. Values of $p < 0.05$ were considered significant. Data were analyzed using the statistical software programs Epi Info 2002 and BioEstat 3.0.

**Results**

Of the 1520 students included in the study, there was a predominance of females in both schools (61.6% in the public school and 56.2% in the private school), with ages ranging from 13 to 19 years and a mean age of 17 years ($\pm$1.26) in the public school and 16 years ($\pm$1.02) in the private school. The most common socioeconomic levels were classes C (55.8%) and D (18.5%) in the public school and classes A (31.6%) and B (56.8%) in the private school.

The incidence of smoking experimentation was 44.7% (513 students); 52.1% in the public school and 36.7% in the private school ($p < 0.001$). The incidence of current smoking was 11% (167 students): 14.6% in the public school and 7% in the private school ($p < 0.001$) (Figure 1).

Of the students who reported experimenting with smoking, female students corresponded to 59% and 53%, respectively, in the public and private schools, which was not significantly different from that seen among male students. In both schools, the first cigarette was often obtained from a friend (59.2% in the public one and 64.7% in the private one).

There was no statistical difference between genders in the frequency of current smoking. The frequency of female smokers was 48.3% in the public school and 51% in the private school. Of the current smokers, 67.2% and 62.7% of the students in the public school and in the private school, respectively, reported being smokers for over 12 months; 59.5% and 39.2% of the students in the public school and in the private school, respectively, reported smoking every day.

In addition, 83.6% and 82.4% of the smokers in the public school and in the private school, respectively, reported buying their own cigarettes. Considering only the students who were younger than 18 years of age, 52.2% of those who experimented with smoking and 68.7% of the current smokers had never been denied when trying to buy cigarettes.

Smokers reported that the main influence for their current smoking was their curiosity (62.1% in the public school and 73.1% in the private school, respectively), followed by the influence of friends, parents, siblings and the media (Figure 2).

Regarding the relationship between experimenting with smoking and conversations about smoking with the family, Table 1 shows that those students whose parents did not talk about smoking at home or those who reported that their parents would not be upset if they smoked did not show differences from those whose parents talk about smoking or would be upset with smoking. However, students who had never been praised for not smoking showed higher experimentation with smoking (prevalence ratio [PR] = 1.32; 95% confidence interval [95% CI]: 1.15–1.51) than did those who reported having been praised.

Figure 3 shows the relationship between current smokers and nonsmokers and their self-perception...
Discussion

Most national and international studies on smoking during adolescence are school-based.\(^{(4,7,10-12)}\) Few are population-based studies.\(^{(13,14)}\) Although some authors reported that school-based studies underestimate the problem, using the school environment as a data source favors the execution of field research since this makes programmed, simultaneous data collection possible, respecting ethical regulations and minimizing losses and financial costs of the study.\(^{(14)}\)

regarding academic performance; smokers showed a significant association with their own perception of having a poor or mediocre academic performance. Similarly, those who experimented with smoking showed significant association with poor academic performance in the public school (PR = 1.46; 95% CI: 1.23-1.72), but not those in the private school (PR = 1.17; 95% CI: 0.93-1.46).

Table 2 shows the relationship between experimenting with smoking and socioeconomic level of the students, according to the school type. Experimenting with smoking showed a significant association with socioeconomic levels A and B in the private school (PR = 2.10; 95% CI: 1.25-3.49); however, there was no association with the various socioeconomic levels in the public school.

### Table 1 - Comparison between students who experimented with smoking and are current nonsmokers and those who never smoked (n = 1353), regarding conversations about smoking with the families - Belém, Brazil - 2005.

<table>
<thead>
<tr>
<th>Influences</th>
<th>Exponenter</th>
<th>PR (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (n = 513)</td>
<td>No (n = 840)</td>
<td></td>
</tr>
<tr>
<td>Parents talk about smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>211 (41.0%)</td>
<td>320 (38.0%)</td>
<td>1.08 (0.94-1.24)</td>
</tr>
<tr>
<td>Yes</td>
<td>302 (59.0%)</td>
<td>520 (62.0%)</td>
<td></td>
</tr>
<tr>
<td>Parents praise for not smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>235 (46.0%)</td>
<td>293 (35.0%)</td>
<td>1.32 (1.15-1.51)</td>
</tr>
<tr>
<td>Yes</td>
<td>278 (54.0%)</td>
<td>547 (65.0%)</td>
<td></td>
</tr>
<tr>
<td>Parents would be upset if you smoked</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No/ I don’t know</td>
<td>101 (20.0%)</td>
<td>152 (18.0%)</td>
<td>1.08 (0.91-1.27)</td>
</tr>
<tr>
<td>Yes</td>
<td>410 (80.0%)</td>
<td>688 (82.0%)</td>
<td></td>
</tr>
</tbody>
</table>

PR: prevalence ratio; and CI: confidence interval.
The proportion of adolescents who experimented with smoking in their lifetime was 44.7%. However, this rate was significantly higher in the public school than in the private school. This value is different from that of the last national survey on psychotropic drug use,\(^7\) which reported a prevalence of lifetime use of 23.7% in Belém. However, when we analyze those data regarding age brackets, the prevalence of lifetime use in the 16 to 18 year age bracket was 35.9% and that in the over 18 year age bracket was 41.4%, which is closer to the values found in the present study, in which the students were mainly in the 16 to 17 year age bracket.

Regarding the variable gender, experimentation and current smoking were the same for males and females. These findings corroborate those of some other studies showing, in historic series, that smoking has been more frequent among girls, a trend that has already been reported in developed countries, where females present rates of smoking experimentation and current smoking that are equal to or greater than those of males.\(^{4,6,13}\)

The fact that most students obtained their first cigarette from a friend shows that the initiation of smoking is linked to their social relationships, showing that these students need to identify themselves with and be part of their social group. This need and their curiosity, which are inherent characteristics of adolescents, are decisive in this process.

Regarding the higher prevalence of smoking among students in the public school, the data found in the literature are controversial. In a similar survey carried out in the city of São Paulo,\(^{15}\) the proportion of smokers in the public and in the private schools was the same; only the number of cigarettes smoked per day was different.

However, in another study, data similar to those of the present study were reported, showing that the prevalence of smokers among adolescent Argentine students was higher in public schools (14.6%) than in private schools (11.4%).\(^{16}\)

The Brazilian anti-smoking legislation,\(^{17}\) which prohibits the sale of any tobacco products to individuals younger than 18 years of age, carrying a penalty of six months to two years in prison, as well as a fine, for the sellers, appears to be inoperative, since most of the students younger than 18 years of age have been able to buy cigarettes.

The easy access to cigarettes also works as an incentive for the maintenance of the smoking habit because the adolescent becomes self-sufficient to buy cigarettes whenever there is the biological and psychosocial need.

The economic issue involved in the habitual use of cigarettes has been evaluated in some market studies, showing that a marked increase in the prices of cigarettes significantly reduces smoking among
young people, who are more sensitive to price variations than are adult smokers.\(^{[18]}\)

With regard to the influence of parents on the smoking habits of children, there is no consensus in the literature.\(^{[14,16-20]}\) Some studies have shown that this behavior can facilitate the smoking habit in children, due to the behavioral example set and the availability of cigarettes in the home. Such easy access to cigarettes also causes early direct biochemical stimulation of the nicotinic receptors, which are acquired through inheritance.\(^{[12,14]}\)

Similarly, the presence of siblings and friends who smoke has been shown to be strongly associated with smoking experimentation and current smoking of the students. The influence of smokers in the same age bracket as the adolescent is particularly strong in the initial phases of tobacco use, since the first attempts to experiment with smoking frequently occur with siblings and friends, and these may provide expectations, reinforcement and subsequent suggestions in favor of the maintenance of the habit. Various studies on smoking during adolescence are unanimous in pointing out these associations.\(^{[14-16,18,20-23]}\)

The self-perception of students regarding their poor academic performance was shown to be associated with smoking initiation and current smoking, since considering their academic performance poor or mediocre was significantly present among the experimenters in the public school. These findings are in agreement with those of a follow-up study\(^{[20]}\) in which the students who reported mediocre or below average academic performance were more predisposed to the genesis and maintenance of the smoking habit.

The socioeconomic levels of students showed different associations with smoking experimentation depending on the type of school. Socioeconomic levels A and B showed significant associations with smoking experimentation in the private school but not in the public school, although the number of experimenters from classes C and D was small in the private school. This fact, together with other data from this study, shows that experimentation during adolescence is probably more closely linked to patterns in the social group than to the socioeconomic level.

Therefore, the results of the present study have provided various data regarding the variables related with smoking initiation among students from different social realities in the city of Belém. These findings could serve to expand the arsenal of regional interventions designed to combat and prevent smoking in the community, schools and families, especially targeting adolescents.

References


13. Carlini EA, Galduróz JCF, Noto AR, Nappo SA. I Levantamento domiciliar sobre o uso de drogas psicotrópicas no Brasil: