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ORIGINAL ARTICLE / *ARTIGO ORIGINAL*

Experimentation and use of cigarette and other tobacco products among adolescents in the Brazilian state capitals (PeNSE 2012)

Experimentação e uso atual de cigarro e outros produtos do tabaco entre escolares nas capitais brasileiras (PeNSE 2012)

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ABSTRACT: ***Introduction:*** Nicotine dependence establishes itself more rapidly among adolescents than among adults. Tobacco occupies the fourth place in the rank of main risk factors for non-communicable diseases in the continent. Studies reveal that other forms of tobacco use have increased among adolescents. ***Methods:*** Were included the 9th grade students from the 26 State Capitals and the Federal District. who were participants of the National Adolescent School-based Health Survey (PeNSE), in 2012. Factors independently associated with experimentation and regular use of cigarettes were investigated by means of multinomial logistic regression, using as reference "never tried a cigarette". The use of other tobacco products included cigar, pipe, narghile and others. ***Results:*** Of the in the 61,037 participants in the 26 Brazilian capitals and the Federal District, 22.7% (95%CI 21.7 – 23.5) had experimented cigarettes, 6.1% (95%CI 5.6 – 6.6) are regular smokers and 7.1% (95%CI 6.5 – 7.7) had used other tobacco products, with half of them also being regular smokers. The chances of experimenting and being a regular smoker increased with age and according to the frequency of weekly exposure to other smokers. These chances were also higher among students who worked, who lived in monoparental families or without their parents, and those who felt that their parents would not mind if they smoked. ***Conclusion:*** Results reinforce the association between social disadvantages and experimenting and regular smoking. In addition, the use of other tobacco products is worthy of attention and may lead to regular smoking.

Keywords: Smoking. Tobacco. Adolescent. School health. Risk factors. Nicotine.

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RESUMO: ***Introdução:*** A dependência da nicotina é estabelecida mais rapidamente entre adolescentes do que entre adultos. O tabaco ocupa o quarto lugar no ranque dos fatores de risco mais importantes no Continente. Estudos mostram que diferentes formas de uso de tabaco têm crescido entre adolescentes. ***Métodos:*** Foram incluídos os escolares das 26 capitais e Distrito Federal participantes da Pesquisa Nacional de Saúde do Escolar (PeNSE) 2012, realizada com alunos da 9ª série de escolas públicas e privadas. Fatores associados à experimentação e ao uso regular de cigarro foram investigados por meio de regressão logística multinomial, tendo como referência "nunca experimentou cigarro". O uso de outros produtos de tabaco nos últimos 30 dias (charuto, cachimbo, narguilé, etc.) também foi analisado nesse estudo. ***Resultados:*** Dos 61.037 participantes nas capitais brasileiras, 22,7% (IC95% 21,7 – 23,5) experimentou cigarro, 6,1% (IC95% 5,6 – 6,6) é fumante regular e 7,1% (IC95% 6,5 – 7,7) experimentou outros produtos de tabaco, sendo a metade desses fumantes regulares. As chances de experimentação e fumo regular cresceram com o aumento da idade e a frequência de exposição semanal a outros fumantes, e foram maiores entre escolares que trabalham, entre residentes em lares monoparentais ou sem os pais, e entre os que percebem que os pais não se importariam se fumassem. ***Conclusão:*** Os resultados mostram associação entre desvantagens sociais e experimentação e fumo regular. Além disso, o uso de outros produtos de tabaco merece atenção e pode ser porta de entrada para o tabagismo regular.

Palavras-chave: Hábito de fumar. Tabaco. Adolescentes. Saúde escolar. Fatores de risco. Nicotina.

INTRODUCTION

Smoking, and also the passive exposure to smoking, was the second most important risk factor for the load of diseases in the world in 2010[1]. In 1990, the use of tobacco was responsible for 6.1% (95%CI 5.5 – 7.0) of disability-adjusted life years (DALY) in the world and, in 2010, for 6.3% (95%CI 5.5 – 7.0). In the USA, it is estimated that half the adult smokers die early due to diseases related to tobacco, such as cancer and cardiovascular disease[2]. Despite the decreasing smoking tendency in most South American countries, especially in Brazil, tobacco still holds the forth position in the rank of most important risk factors in the continent. Obesity is the main cause, followed by alcohol and arterial hypertension[1].

A great challenge for public health is to prevent, or at least delay the experimentation and the regular use of cigarettes. Tobacco experimentation usually takes place in adolescence, and the sooner it happens, the higher the chances of tobacco addiction. Studies show that most adult smokers were already smokers at the age of 18[3].The duration and the number of required cigarettes to establish nicotine dependence is lower for adolescents than for adults, which is why tobacco addiction is established faster[4]. Besides, early smoking is associated with increasing chances of using other psychoactive substances, such as alcohol and illicit drugs among adolescents[5]. Among the several

factors that lead to the early use of tobacco, the household exposure to smoking stands out. This is due to the fact that such consumption is learned and facilitated by interactions established between adolescents and their close socialization contexts, such as family, school and friends[6].

From 1989 to 2010, Brazil raised the taxes on tobacco, instituted restrictions on commercialization and use in public spaces, and established health warnings in cigarette packs, among other control measures[7,8]. As a result, smoking has consistently decreased in the adult population[9-11]. From 1999 to 2004, there seems to have been a reduction in the use of cigarettes among students in the elementary and high school in several Brazilian capitals[12]. Even though the cigarette is the main form of exposure to tobacco in the world[13], the use of other tobacco products, such as narghile, has been increasing among adolescents globally[14]. Studies indicate that the deleterious effect of tobacco inhaled through a water pipe on health seems to be comparable to that of the cigarette[15]. For this reason, tobacco surveillance has incorporated these new forms of exposure to tobacco among adolescents and students.

This study aims at describing the several forms of exposure to tobacco among students in the Brazilian capitals and in the Federal District, who participated in the National Adolescent School-based Health Survey (PeNSE) in 2012, and at identifying sociodemographic and household factors associated with current smoking and experimentation.

METHODS

This study uses data from the second edition of the National Adolescent School-Based Health Survey in 2012. In 2012, PeNSE was conducted with a sample of 9th graders from elementary school attending daytime periods of public and private schools. The sample was representative of the country, of the five macro-regions and the 26 capital, as well as the Federal District. The present analysis was conducted with students of the 26 State capitals and the federal District (n = 61,037).

In order to calculate the sample in each geographic stratum, a 50% exposure prevalence was considered, as well as a maximum error of 3% and a 95% confidence interval. The sampling plan defined 27 geographic strata corresponding to all of the State capitals and the Federal District and five other geographic strata corresponding to the give macro-regions that contained the other cities. The sample of each geographic stratum was proportionally allocated to the number of schools according to administration (private or public). For each one of these strata, a two-stage cluster sampling was selected; schools were the first stage and eligible classrooms in the selected schools were the second stage (9th grade of elementary school). Afterwards, all students were asked to answer the questionnaire. Therefore, a sample of students was obtained in each of the 27 capitals.

For data collection, a self-applied structured questionnaire was used and organized in thematic blocks, which included sociodemographic characteristics, risk and protective

behaviors for health, such as smoking, protective network and others. The students answered the questionnaire in a smartphone. Participation was voluntary, with possibility of not responding. No information that could identify the student was collected, and the school data were confidential and not present in the data base. The research project was approved by the National Research Ethics Committee – CONEP, nº 16,805. The methodology is described in another document[16].

EXPERIMENTATION AND USE OF THE CIGARETTE AND OTHER TOBACCO PRODUCTS

In this study, we used the following variable to describe smoking among students:

- Experimenting cigarettes in life – students who gave a positive answer to at least one of the following questions were considered to be the ones who experimented cigarettes in life: "Have you ever smoked a cigarette, even if one or two drags?", and "In the past 30 days, how often did you smoke cigarettes?";
- Age of experimentation - the used question was: "How old were you when you tried a cigarette for the first time?";
- Regular smoking – defined as the report of having smoked at least once in thirty days prior to the conduction of the study, obtained by the question: "In the past thirty days, how often did you smoke cigarettes?", categorized as "Not once (0)" and "One or more days (1)"; and
- Smoke another tobacco product in the past 30 days – measured by the question: "In the past 30 days, how often did you use other tobacco products, such as: straw cigarettes or hand rolled cigarettes, cigars, cigarillos, Indian cigarette or bali, narghile, snuff, chewing tobacco etc.?", and the answer was characterized as "Not once (0)" and "One or more days (1)".

COVARIABLES OF INTEREST

The explanatory variables were grouped by afinity in two blocks: sociodemographic ones and those relate to exposure to smoking.

The analyzed sociodemographic characteristics were: sex (male and female), age in years (≤ 13, 14, 15, 16, 17 and older), race / color (white, black, mulatto, yellow, indigenous), maternal and paternal schooling (complete higher education, incomplete higher education, incomplete high school, incomplete elementary school, did not attend school, could not inform), live in a residence with (father and mother, with mother, with father, with none of them), school administration (public or private) and insertion of the child in the work market, obtained by the question: "Do you have a job, employment or business nowadays?", categorized as "No" and "Yes", besides region of residency (Southeast, North, Northeast, Center-West and South).

Exposure to cigarette was studied by means of the following questions:

1. "In the past seven days, how often have people smoked at your presence?" ("Not once", "1 – 2 days", "3 – 4 days", "5 days or more)"; and
2. "How would your relatives react if they knew you smoke cigarettes?" ("They would mind a lot", "They would mind a bit", "They would not mind at all", "I do not know if they would mind").

ANALYSIS

At first, the variables that characterize the behavior in relation to smoke by sex and age were described: experimenting cigarette in life, age of experimentation, regular smoking and smoking other tobacco products. In order to study the influence of sociodemographic characteristics and exposure to cigarettes on the behavior of the children with regard to cigarettes, we created the variable "use of cigarette", with the following answer categories: never tried a cigarette; tried a cigarette, but did not use it in the past 30 days (= 1); used a cigarette in the past 30 days (= 2).

The association between the independent explanatory variables and the use of cigarettes was estimated by the Pearson χ^2 test, with significance level of 0.05. The magnitude of the associations was measured by Odds Ratio and its 95% confidence interval (95%CI), obtained by means of the multinomial logistic regression, with the category "never tried a cigarette" as a reference. Explanatory variables associated with the use of cigarette, being $p \leq 0.20$ (statistical significance level) were included in the multivariable analysis. After the adjustment, only the variables associated with the use of cigarette with statistical significance level of 0.05 remained. Due to the major information loss concerning maternal and paternal schooling (around one quarter of students could not inform), this variable was not added to the multivariable analysis.

In order to correct the different probabilities of selection of each student, the definitions of strata, primary units (schools) and individual weights were used to estimate proportions. The analysis was conducted in the software Stata (version 11.1), using the procedure "svy" (with weighing factors), adequate to analyze the data obtained by a complex sampling plan.

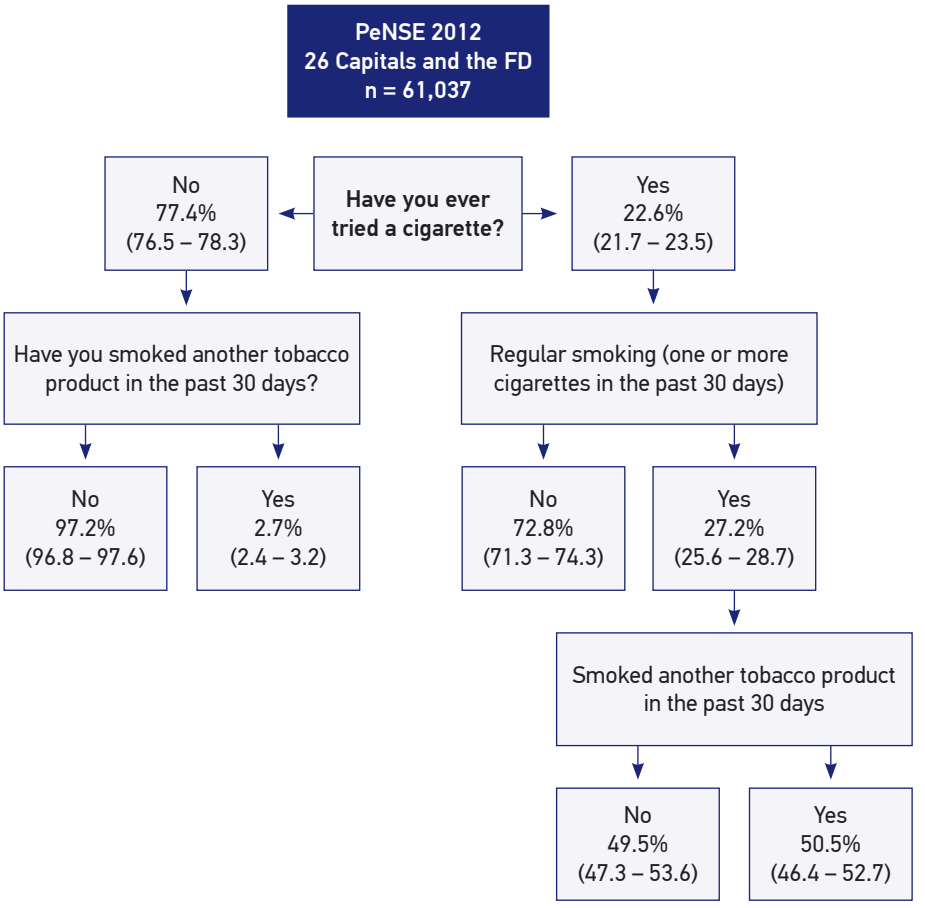
RESULTS

Among the 61,037 students who participated in PeNSE in the Brazilian capitals in 2012, 22.6% (95%CI 21.7 – 23.5) had already experimented cigarette at least once in life, and about 28.5% did it before the age of 11 (Table 1). From all of the students who tried cigarettes at least once in life, about one third of them (27.2%; 95%CI 25.6 – 28.7) used cigarettes regularly, and, among the latter, half of them (50.5%; 95%CI 46.4 – 52.7) also used other tobacco products in the past 30 days. Among the ones who did not experiment cigarettes

in life, 2.7% (95%CI 2.4 – 3.2) used other tobacco products in the past 30 days (Figure 1). In total, considering the cigarette and other tobacco products, 10.1% (95%CI 9.5 – 10.8) of the students used some tobacco product in the past 30 days.

Among the ones who had tried a cigarette, the proportion of boys who used it once to twice and three times or more in the past 30 days corresponded to 6.7%. Among those who regularly used cigarettes, the proportion of boys who used other tobacco products once to twice was of 15.7%, and those who used it three times or more reached 35.6%; these proportions among girls were, respectively, 21.3 and 26.6% (Figure 2).

Among all of the participants of PeNSE, the prevalence of the regular use of a cigarette was equal to 6.1% (95%CI 5.6 – 6.6), and there was no statistically significant difference according to sex. The prevalence of use of other tobacco products in the past 30 days was



Note: The % (95%CI) in the figure refers to individuals who meet the immediately preceding criteria, and not to the overall total of participants.

Figure 1. Distribution of PeNSE participants in 26 State Capitals and the Federal District, according to history of exposure to smoking.

equal to 7.1% (95%CI 6.5 – 7.7), being higher among boys than among girls, 7.6 and 6.6% (p = 0.017), respectively (Table 1).

Using those who never tried a cigarette as a comparison reference, there was no difference in the proportion of boys and girls who reported having tried a cigarette in life and being a regular smoker. Both the chances of experimenting cigarettes and of being a regular smoker increased with age and decreased with the higher parental schooling, with the presence of a gradient in the associations. The students who reported working,

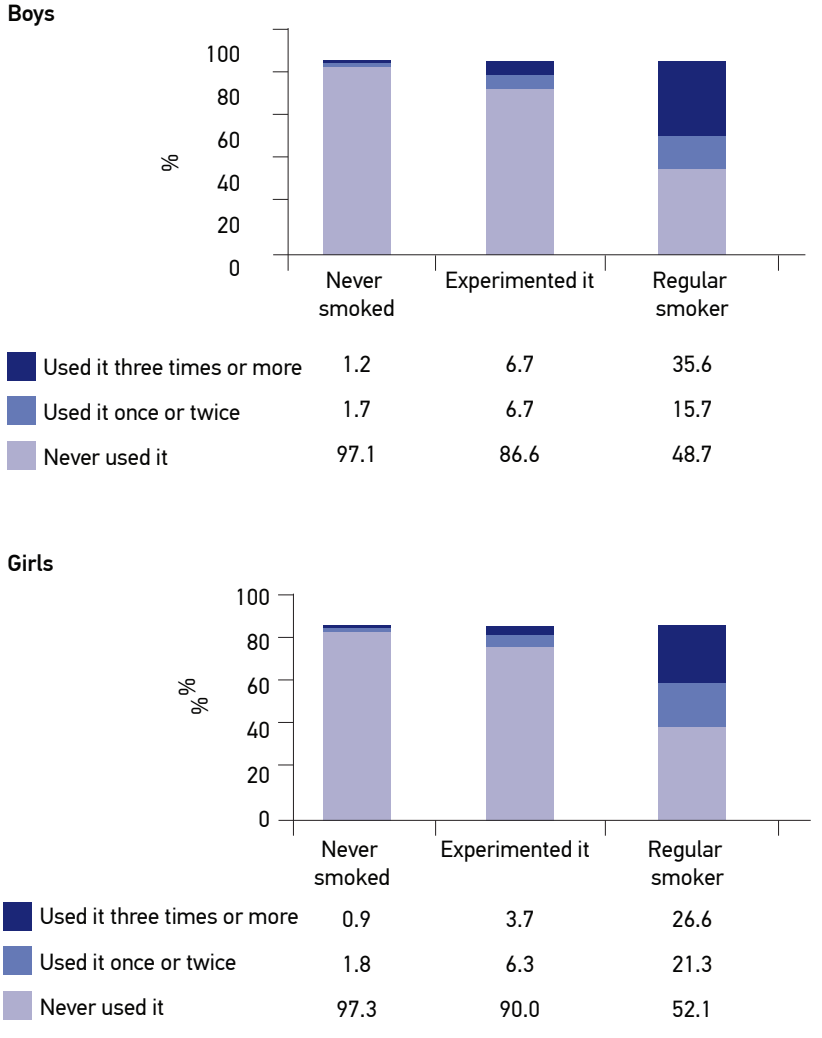


Figure 2. Distribution of students according to the use of cigarettes and other tobacco products by sex in 26 State Capitals and the Federal District. PeNSE, 2012.

living only with their mothers, only with their fathers or with neither, as well as those who lived in the South and Center-West regions of the country, presented higher chances of experimentation and regular use of cigarettes. Those who attended private schools and who lived in the Northeast regions presented lower chances of having experimented cigarettes in life and of being a regular smoker. The higher the number of days on which the student saw another person smoking, the higher the chances of this student experimenting and smoking regularly, with higher magnitude for those who saw someone else smoking every day of the week (OR = 4.27; 95%CI 3.82 – 4.77 for experimenting a cigarette and OR = 15.17; 95%CI 11.73 – 19.62 for being a regular smoker). The perception of the adolescent in relation to the family's reaction concerning the act of smoking has been positively associated with having tried a cigarette and being a regular smoker. In general, the magnitude of associations between explanatory variables and being a regular smoker were stronger than the magnitude of OR for mere experimentation (Table 2).

In the multivariable analysis, the chances of trying a cigarette or smoking regularly, in comparison to those who never tried a cigarette, increased with age and with the frequency with which the students saw someone smoking; it was higher among those who worked or who lived only with their mothers, only with their fathers or with neither, and among those whose parents would not mind much if the son smoked. It was also observed that the chances of trying a cigarette were lower among students who attended private

Table 1. Prevalence of exposure to smoking according to type of exposure by sex among Brazilian 9th graders in the 26 State Capitals and the Federal District. PeNSE, Brazil, 2012.

Exposure to smoking	Boy		Girl		p-value
	%	95%CI	%	95%CI	
Experimented cigarette in life					
Yes	22.3	21.2 – 23.4	22.2	21.0 – 23.4	0.714
Age of experimentation (in years)*					
≤ 9	13.5	12.4 – 14.4	11.5	10.4 – 12.6	0.002
10 – 11	17.0	15.8 – 18.3	15.3	14.6 – 16.1	
12 – 13	39.2	36.6 – 41.9	45.9	39.6 – 52.3	
14	18.4	17.0 – 19.9	18.4	14.6 – 23.0	
≥ 15	12.0	9.1 – 15.5	8.9	6.5 – 12.2	
Smoked cigarettes one day or more in the past 30 days					
Yes	6.1	5.6 – 6.6	6.1	5.4 – 6.8	0.994
Smoked another tobacco product in the past 30 days†					
Yes	7.6	7.0 – 8.2	6.6	5.8 – 7.4	0.017

*% refers only to those who tried cigarettes at some point in life; †% refers to the total of boys and girls participating.

Table 2. Results of the univariate analysis of individual and household factors associated with experimentation and regular cigarette use among Brazilian 9th graders in 26 State Capitals and the Federal District. PeNSE, 2012*.

Independent variables	Ever tried a cigarette		Regular smoker	
	OR*	95%CI	OR*	95%CI
Sex				
Male	1.0		1.0	
Female	0.99	0.89 – 1.08	1.00	0.88 – 1.13
Age (years)				
≤ 13	1.0		1.0	
14	1.25	1.10 – 1.41‡	1.34	1.01 – 1.77‡
15	2.27	1.92 – 2.69‡	3.21	2.43 – 4.24‡
16	2.97	2.50 – 3.54‡	4.78	3.53 – 6.47‡
≥ 17	3.46	2.88 – 4.15‡	6.99	5.17 – 9.46‡
Self-reported skin color				
White	1.0		1.0	
Mulatto	1.19	1.09 – 1.31‡	1.07	0.88 – 1.30
Black	1.29	1.15 – 1.45‡	1.39	1.13 – 1.70‡
Yellow	1.07	0.89 – 1.28	1.17	0.88 – 1.57
Indigenous	1.17	0.98 – 1.41	1.23	0.90 – 1.68
Working				
No	1.0		1.0	
Yes	1.98	1.81 – 2.17‡	3.15	2.68 – 3.70‡
Paternal schooling				
Did not study	1.0		1.0	
Incomplete elementary school	0.83	0.66 – 1.05	0.51	0.41 – 0.64
Incomplete high school	0.77	0.61 – 0.98‡	0.51	0.41 – 0.62
Incomplete higher education	0.68	0.54 – 0.86‡	0.44	0.34 – 0.56
Complete higher education	0.49	0.38 – 0.64‡	0.41	0.31 – 0.54
Does not know	0.71	0.57 – 0.88‡	0.49	0.38 – 0.63
Maternal schooling				
Did not study	1.0		1.0	
Incomplete elementary school	0.96	0.77 – 1.20	0.71	0.52 – 0.96‡
Incomplete high school	0.90	0.71 – 1.16	0.66	0.49 – 0.90‡
Incomplete higher education	0.74	0.60 – 0.92‡	0.57	0.43 – 0.74‡
Complete higher education	0.58	0.46 – 0.75‡	0.46	0.34 – 0.62‡
Does not know	0.74	0.59 – 0.92‡	0.62	0.47 – 0.82‡

Continue...

Table 2. Continuation.

Independent variables	Ever tried a cigarette		Regular smoker	
	OR*	95%CI	OR*	95%CI
Living with				
Father and mother	1.0		1.0	
Mother	1.44	1.32 – 1.58‡	1.61	1.41 – 1.86‡
Father	1.89	1.62 – 2.19‡	1.98	1.49 – 2.64‡
Neither	2.11	1.83 – 2.43‡	2.48	2.03 – 3.04‡
Type of School				
Public	1.0			
Private	0.57	0.51 – 0.64‡	0.53	0.45 – 0.63‡
Region of Residency				
Southeast	1.00		1.00	
Northeast	0.87	0.77 – 1.00	0.63	0.51 – 0.77‡
North	1.15	1.00 – 1.31	1.00	0.81 – 1.26
Center-West	1.20	1.05 – 1.37‡	1.15	0.96 – 1.42
South	1.55	1.32 – 1.86‡	1.49	1.19 – 1.86‡
Saw someone smoking in the past week				
Not once	1.0		1.0	
1-2 days	1.67	1.50 – 1.85‡	3.17	2.47 – 4.07‡
3-4 days	3.18	2.81 – 3.60‡	8.80	6.76 – 11.46‡
5-6 days	3.80	3.20 – 4.52‡	12.46	9.24 – 16.80‡
Every day	4.27	3.82 – 4.77‡	15.17	11.73 – 19.62‡
Parental reaction† if child smoked				
Would mind a lot	1.0		1.0	
Would mind a little	2.24	1.83 – 2.76‡	6.46	5.12 – 8.14‡
Would not mind	1.19	0.84 – 1.68	9.13	6.77 – 12.30‡
Does not know	1.43	1.67 – 1.76‡	3.27	2.53 – 4.22‡

*Odds Ratio obtained through multinomial logistic regression, having as reference category "never tried cigarettes";
†Or a person responsible of the same sex; ‡$p < 0.05$.

schools, but there was no statistical difference in the chances of being a regular smoker among students in public and private schools. Students in capitals of the Northeast region presented fewer chances of trying and smoking cigarettes regularly, and those living in the capitals of the South and Center-West regions presented higher chances of trying and using cigarettes regularly (Table 3).

Table 3. Factors associated with experimentation and regular cigarette use in the multivariable analysis among Brazilian 9th graders in 26 State Capitals and the Federal District. PeNSE, Brazil, 2012.

Sociodemographic variables	Ever tried a cigarette		Regular smoker	
	OR*	95%CI	OR*	95%CI
Sex				
Male	1.0		1.0	
Female	1.01	0.92 – 1.12	1.11	0.96 – 1.28
Age (years)				
≤ 13	1.0		1.0	
14	1.21	1.06 – 1.38‡	1.29	0.94 – 1.76
15	1.92	1.62 – 2.29‡	2.53‡	1.85 – 3.46‡
16	2.40	2.03 – 2.84‡	3.54	2.54 – 4.93‡
≥ 17	2.77	2.30 – 3.35‡	4.82	3.46 – 6.71‡
Working				
No	1.0		1.0	
Yes	1.55	1.40 – 1.71‡	2.15	1.83 – 2.53‡
Living with				
Father† and mother†	1.0		1.0	
Mother†	1.28	1.16 – 1.40‡	1.25	1.04 – 1.49‡
Father†	1.58	1.35 – 1.85‡	1.62	1.17 – 2.23‡
Neither	1.60	1.39 – 1.85‡	1.53	1.18 – 1.99‡
Type of school				
Public	1.0			
Private	0.80	0.72 – 0.90‡	0.92	0.77 – 1.10
Region of residency				
Southeast	1.00		1.00	
Northeast	0.86	0.76 – 0.96‡	0.62	0.51 – 0.74
North	1.10	0.97 – 1.25	1.01	0.82 – 1.26
Center-West	1.24	1.11 – 1.39‡	1.22	1.00 – 1.50
South	1.59	1.38 – 1.83‡	1.52	1.22 – 1.87‡
Saw someone smoking in the past week				
Not once	1.0		1.0	
1 – 2 days	1.61	1.45 – 1.81‡	3.08	2.40 – 3.95‡
3 – 4 days	2.97	2.62 – 3.72‡	7.99	6.10 – 10.47‡
5 – 6 days	3.51	2.94 – 4.20‡	11.03	8.11 – 15.00‡
Every day	3.75	3.34 – 4.21‡	11.90	9.23 – 15.33‡
Parental reaction† if kid smoked				
Would mind a lot	1.0		1.0	
Would mind a little	1.82	1.47 – 2.25‡	4.57	3.56 – 5.85‡
Would not mind	0.83	0.92 – 1.40	5.34	3.79 – 7.51‡
Does not know	1.14	0.72 – 0.90‡	2.39	1.82 – 3.13‡

*Odds Ratio obtained through multinomial logistic regression, having as reference category "never tried cigarettes";
†Or a person responsible of the same sex; ‡$p < 0.05$.

DISCUSSION

This study showed that one out of five 9th graders of elementary school in Brazilian capitals already tried a cigarette, and more than one quarter of those who tried a cigarette is a regular smoker. The results also show that half the current cigarette consumers also used, in the past month, other tobacco products, and the combined use of tobacco derivatives was more frequent among boys than girls. With regard to cigarettes, boys and girls have no differences concerning the chances of experimenting cigarettes or of being regular smokers. Finally, we confirm that the exposure to other smokers and the perception of the family accepting the act of smoking are associated both to experimentation and to the regular use of cigarettes, with dose-response gradient in the found associations.

The prevalence of trying cigarettes decreased among the capitals investigated in PeNSE in 2009[17] and in 2012, but the prevalence of regular smokers among students did not change in the same period. These results suggest that the several measures adopted by the smoking control policy in the country[8] are still very important. However, the unchanged prevalence of regular smokers among school children should be of great concern due to the impact of early smoking on higher chances of tobacco addiction, the increasing difficulties to stop smoking and the worse health outcomes in adulthood[18-21]. It is important to highlight that, in the Americas, Brazil has the lower prevalence of regular smoking among adolescents[22].

A recent study about the susceptibility of smoking among students who never smoked, aged between 13 and 15 years old who participated in the Global Youth Tobacco Survey (SYT) in 168 countries, identified that 12.5% of these students were prone to smoking[23]. In this sense, the use of other forms of exposure to tobacco, which is an insidious and growing problem among adolescents worldwide[24,25]. Our results show that, in 2012, the general prevalence of use of other tobacco products was higher than the isolated use of cigarettes in the past 30 days, especially among boys, even though most students use both product concomitantly, as in other countries[26].

In total, 2.7% of the students who had never tried a cigarette reported having used another tobacco derivative. This percentage seems to be small and harmless, however, it represents a large number of adolescents all over the country who would be prone to becoming a smoker. The number of adolescents aged 14 to 17 years old who uses other tobacco products, but does not smoke cigarettes, increased 5.9% a year in the USA between 2004 and 2009[27]. It is worth to mention that there is no safe level of exposure to tobacco. It is also possible that these new ways of smoking, such as the use of narghile and the electronic cigarette, which are spreading among adolescents, can be an initiation to regular smoking[28]. Therefore, it is believed that education and anti-tobacco public policies in general need to approach these new forms of introducing tobacco to adolescents in the country.

The results of this study show that not only the chances of trying, but especially of currently using a cigarette, increases with the weekly frequency of exposure to other smokers and with family acceptance. A cross-sectional population study with students aged between 11 and 14 years old (elementary and high school) of public and private students of Salvador,

Bahia, observed that the early smoking was associated with paternal smoking, and with the fact of having friends who smoked, among other factors[29]. A study with a representative sample of Brazilian adolescents aged 15 to 19 years old also found a significant dose-response gradient between the number of smokers in the household and the chances of smoking among young people old in 2008[30].

Several theories and studies support the thesis of contagion to explain the influence of family members and friends on the dissemination of cigarettes among young people[31]. One of the most famous theories is that of social learning[31], according to which adolescents could learn a deviant behavior by means of simply observing or by imitating behaviors of people who are close to them, besides the social reinforcement that results from these behaviors. By considering this theory, the frequent exposure to people who smoke and the perceived non-rejection of initiation to smoking by parents could be considered as the indicators of deviant models and social reinforcement.

Unfortunately, PeNSE does not show who the adolescents usually see smoking, but the observed dose-response gradient in the found associations reinforces the hypothesis of social contamination and the need to stimulate parents to adopt explicit rules against smoking in the house. In this sense, it would be important to promote debates and campaigns defending tobacco-free households all over the country. Such a recommendation should also be approached in appointments with adults in primary care, in household visits of health community agents, among others.

The higher chances of experimenting and smoking observed among adolescents who have a paid work may indicate social inequalities concerning health, since child labor tends to have a negative impact on psychosocial development and the studies of the adolescent[32]. Besides, students who earn a salary also have more resources to buy cigarettes. It is also possible that child labor exposes the adolescent to other smokers, especially in informal and precarious jobs, where there is little restriction to smoking.

The influence of family composition on the behavior and the mental health of the child has been widely debated due to the increasing number of divorces and new family arrangements, including marriages between individuals of the same sex. There seems to be no doubt that divorces reduce family per capita income, which alone can affect the quality of life[33]. Studies show that smoking, as well as other adverse behaviors to health, are more frequent among adolescents who live in monoparental households when compared to those living in biparental households[34]. It is possible that painful family separations can contribute with depression and with the higher frequency of adolescents who smoke among those whose parents split up in comparison to other people in the same age group[35]. However, it is also possible that adolescents who live in monoparental households or with neither of the parents have less parental supervision, and this factor is knowingly associated with risk behaviors among adolescents[5].

Even though most Brazilian adolescents are in school (about 97%), it is known that those who drop out of school early or the ones who miss classes often present worse health conditions and/or other risk behaviors. Thus, the prevalences found here are

probably underestimated[30]. It is worth to mention that PeNSE does not represent the adolescents in the age groups age groups included in the analysis, since the sampling base is the school grade in daytime periods. Therefore, the found prevalence cannot be used to represent the ages included in the sample. The results refer only to capitals and the Federal District, and they may differ from students in the countryside of the states. We chose to analyze only capitals in order to compare data with those of PeNSE 2009. Besides, this is a cross-sectional study, which does not allow establishing a temporal relationship between the response variable and the analyzed contextual and family conditions.

CONCLUSION

Smoking during adolescence has important implications for the well-being and the health of the adolescent throughout life, due to the higher risk of non-communicable chronic diseases and depression during adulthood. The results of this study show the importance of increasing the surveillance on smoking among adolescents, both concerning cigarettes and other forms of tobacco. Besides, they point out to the need of educating and expanding tobacco-free homes in the country, which is a simple and efficient way to reduce the secondary exposure to tobacco and also to discourage its initiation and use.

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