

Prevalence of smoking in Brazilian schoolteachers, 2016

Prevalência de tabagismo entre professores da Educação Básica no Brasil, 2016

Prevalencia del tabaquismo entre profesores de Educación Básica en Brasil, 2016

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Abstract

This cross-sectional study investigated the prevalence of smoking and associated factors in a nationally representative sample of 6,510 Brazilian schoolteachers. Data were obtained from telephone interviews using a questionnaire on sociodemographic information, health status, work absenteeism, and the characteristics of teaching work. Smoking was analyzed as a dichotomous variable using univariate and multivariate logistic regression. Overall smoking prevalence was 4.4%. Prevalence in men was 5.9% and was higher in those over 55 years of age (10.7%). Prevalence in women was 3.5% and was higher from 45 to 54 years of age (5.5%). The final multivariate model showed a negative association between smoking and female gender (OR = 0.46), being married or living with partner (OR = 0.53), occasional voice problems at work (OR = 0.64), and longer commuting time to and from school (OR = 0.58). The results showed positive associations between smoking and older age (OR = 2.59), living in the South (OR = 1.98) and Southeast Brazil (OR = 2.07), insufficient physical activity (OR = 1.66), and use of anxiolytics or antidepressants (OR = 2.46). Prevalence of smoking in Brazilian schoolteachers was relatively low. Unexpectedly, although cited as inadequate by the teachers, work conditions and demands in the schools did not reach statistical significance with smoking in the current study.

Smoking; School Teachers; Cross-Sectional Studies

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Introduction

In the tenth revision of the International Classification of Diseases (ICD-10) ¹, smoking is classified in the group of mental and behavioral disorders. This grouping includes many disorders that differ from each other in severity and symptomatology, but which have in common a relationship with the use of psychoactive substances with or without a medical prescription. Smoking is the leading global preventable cause of morbidity and mortality and one of the main risk factors for chronic noncommunicable diseases (NCDs) ².

Smoking has decreased in Brazil according to data from VIGITEL ³, the Ministry of Health's system aimed at monitoring the principal determinants of NCDs in the adult population of the country's 26 state capitals and the Federal District. In 2006, 15.7% of Brazilian adults were smokers. By 2016, smoking prevalence had dropped to 10.2%, higher in men (12.7%) than in women (8%). Even with this reduction in prevalence in recent years, smoking is still considered a serious public health problem, especially in terms of the costs to the health system ². The fight against smoking has gained momentum with campaigns and educational activities by the Federal government, through the Ministry of Health, in collaboration with the Brazilian National Cancer Institute (INCA), World Health Organization (WHO), and Pan American Health Organization (PAHO) ⁴.

Schools are known to be a prime locus for such campaigns and educational activities, since schoolteachers and their attitudes can influence students' choices to start or quit smoking ^{5,6,7}. Since 2007, Brazil has implemented the National School Health Program (PSE), an inter-sector policy of the Ministries of Health and Education in response to recommendations by PAHO for the development of Regional Initiatives for Health Promoting Schools ⁸. The strategy involves the entire school community, with an emphasis on students' health promotion, providing for the creation and maintenance of healthy physical spaces, including cigarette- and drug-free environments, among other measures ⁸.

Work characteristics influence individuals' vulnerability to harmful behaviors and illness ⁹. The negative effects of work on schoolteachers' health can be identified by examining smoking, since it is related to the work's characteristics ^{9,10} and is considered indicative of the individual's overall health status ¹¹.

There is now a growing trend to examine individual habits associated with increased odds of illness, rather than focusing on classical occupational risks or diseases, as in the traditional occupational health approach ¹². This suggests taking a more cautious look at how work favors or impedes adherence to healthy habits, which in turn explains the growing prevalence of noncommunicable diseases ¹³.

There is irrefutable evidence that individuals' relationship with their surroundings is heavily associated with the production of tensions, known jointly as stress, the effects of which include adverse psychological situations. In the case of Brazilian schoolteachers, this includes anxiety produced by overlapping demands in carrying out their activities and the worries resulting from the teaching-learning process in the current context of heavy pressure and multiple, often mutually conflicting tasks. This unfavorable scenario is aggravated by low pay, time pressures, and violence and lack of discipline in the classroom, thus increasing the odds of substance use ¹⁴.

Smoking – both previous and current – is a constant variable in studies on schoolteachers' health conditions and lifestyles ^{15,16,17}, especially in research on voice disorders ^{18,19}. However, it tends to be a secondary event in studies on outcomes, rather than highlighting it as the target event.

The current study thus aimed to investigate smoking prevalence and associated factors in Brazilian schoolteachers in a representative national sample.

Methods

This cross-sectional study focused on a sample of Brazilian schoolteachers currently working in basic education, which in Brazil includes preschool (children under 5 years), primary (6 to 14 years), and secondary (15 to 17 years) ²⁰.

This study on smoking in Brazilian schoolteachers analyzes data from a nationwide survey on Brazilian schoolteachers' health, called Educatel Brazil, conducted through an agreement between Federal University of Minas Gerais (UFMG) and the Ministry of Education. The survey aimed to

investigate factors associated with absenteeism and to present a map of the health status and work conditions of Brazilian schoolteachers in a representative national sample ²¹.

At the time of the data collection, from October 2015 to March 2016, the total population for the Educatel Study was 2,229,269 teachers ²². Selection of the schoolteachers for the study sample started with stratified sampling based on the following criteria: (a) major geographic regions of the country; (b) school's census area, namely urban versus rural; (c) schoolteachers' age brackets; (d) gender; (e) school's administrative jurisdiction; (f) type of teaching contract; and (g) grade level in which the teacher was working. After stratification, simple random sampling was performed in each of the resulting strata. Sample calculation assumed the following parameters: 38% prevalence of absenteeism among schoolteachers ¹⁵, 95% confidence interval, 2% predicted error, and 20% losses. A sample size of 6,500 schoolteachers was reached. More information on the procedures used in the sample design are provided in a complementary methodological study ²³.

A team of 30 previously trained interviewers conducted the computer-assisted telephone interviews. The team also included two supervisors and a coordinator, besides researchers from the Center for Studies on Health and Work at UFMG who monitored the entire process. Teachers were excluded if they worked in schools with no possibility for telephone contact or if they had not been contacted after 15 attempts. After identification of the potentially eligible individuals for the sample (7,642 schoolteachers), the telephone calls began, totaling 119,378 calls. Details on the survey design are described in a complementary study ²⁴.

The study's dependent variable, "current smoker", was based on the answers to the following questions: "Are you now or have you ever been a smoker, that is, have you smoked at least 100 cigarettes (five packs) in your life? (no/yes)" and "Do you smoke cigarettes now? (no/yes)". Schoolteachers that answered yes to both questions were classified as "current smokers" and those who answered no to one of the two were classified as "non-smokers".

The independent variables used in the analysis included the schoolteachers' individual and work characteristics and were organized in four blocks. The individual variables comprised two blocks: (1) Sociodemographic information: gender (male/female), age (≤ 34 years/35-44 years/45-54 years/ ≥ 55 years), teacher's educational level (primary or middle school – completed or in progress/university – completed or in progress), marital status (single or without partner/married or with partner), children (no/yes), self-reported race (white/black or brown/Asian-descendant or indigenous/other), monthly income (≤ 3 times the minimum wage/ > 3 times the minimum wage), and major geographic region (Northeast/North/Central/South/Southeast).

(2) Health status: physical activity (sufficient/insufficient), missed work in the last 12 months (no/yes), work problems due to voice (no/sometimes/frequently), frequent sleep loss due to worries (no/yes), use of anxiolytics or antidepressants in the four weeks prior to the interview (no/yes), and self-rated health (good or very good/fair/bad or very bad).

The variable "physical activity" was defined as the combination of type, weekly frequency (1-2 days a week/3-4 days a week/5-6 days a week/every day, including Saturday and Sunday), and duration (less than 10 minutes/10-19 minutes/20-29 minutes/30-39 minutes/40-49 minutes/50-59 minutes/ ≥ 60 minutes) of physical activity reported by the interviewee. "Sufficient physical activity" was defined as practicing moderate physical exercise for at least 30 minutes a day on at least five days of the week ³.

"Voice problems at work" was based on the question: "In the last four weeks, have you had problems with your voice at work or in your professional development?" The options were "never or almost never" and "rarely" were grouped as "no", and the options "sometimes" and "frequently" were maintained as such.

The variable "frequent loss of sleep due to worries" was based on the question: "In recent weeks, how often have you lost sleep due to worries?" The options "not at all" and "no more than usual" were grouped as "no", and the options "a little more than usual" and "much more than usual" were grouped as "yes".

"Self-rated health" was examined with the question: "In general, would you say that your health is: (very good/good/fair/bad/very bad)". The answers were grouped as "good or very good", "fair", and "bad or very bad".

The work-related variables formed the other two blocks:

(1) Job information: time working in basic education (less than 10 years/10-20 years/more than 20 years), currently also working in another school (no/yes), type of teaching contract (public admissions/covered by labor legislation/tenured, stable and private school system/private school system/temporary contract), other paid activity besides teaching (no/yes), workweek exceeding 40 hours (no/yes).

(2) Occupational stressors: commuting time to and from school (≤ 30 minutes/31-60 minutes/61-120 minutes/ ≥ 121 minutes), loud noise in classroom (no/yes), lack of discipline in classroom (no/yes), suffered verbal violence by students in the 12 months prior to the interview (no/yes), suffered physical violence by students in the 12 months prior to the interview (no/yes), heavy work demands (no/yes), sufficient time for work tasks (yes/no).

The variables dealing with loud noise and lack of classroom discipline were examined with the question "How often is the noise at work so strong the you have to raise your voice to talk to others? (frequently/sometimes/rarely/never or almost never)" and "How often is your workplace agitated due to lack of student discipline? (frequently/sometimes/rarely/never or almost never)", respectively. Both were transformed into dichotomous variables, and the categories were grouped in the options "no" (rarely/never or almost never), and "yes" (frequently/sometimes).

Verbal or physical violence by students was measured by the questions: "In the last 12 months, have you ever suffered verbal violence from students? (never/once/twice or more)" and "In the last 12 months, have you ever suffered physical violence from students? (never/once/twice or more)". Here as well, the variables were transformed into dichotomous, and the options were grouped as "no" (never) and "yes" (once/twice or more).

The variable "heavy work requirements" was examined with the question: "Does your work demand too much of you? (frequently/sometimes/rarely/never or almost never)". Concerning sufficient time to complete the tasks at work, the following question was used: "Do you have enough time to complete all the tasks at your work? (frequently/sometimes/rarely/never or almost never)". For both variables, the answers "sometimes/rarely/never or almost" were grouped as "no", and "frequently" was transformed into "yes".

Data were analyzed with Stata, version 10.0 (<https://www.stata.com>), in five stages: (1) a descriptive analysis considering sociodemographic variables, health status, employment variables, and occupational stressors; (2) estimate of smoking prevalence according to the categories of explanatory variables; (3) univariate logistic regression; (4) multivariate logistic regression by blocks (sociodemographic, health status, and work characteristics) including the variables associated with smoking ($p \leq 0.20$) in the univariate analysis; and (5) multivariate logistic regression including the variables associated with the outcome at $p \leq 0.05$ in the multivariate analyses by blocks.

Selection of the variables to construct the final model for the multivariate analysis used the backward stepwise method. Thus, the explanatory variables selected in the previous stages were included in the logistic regression analysis and were removed one by one until the final model consisted only of variables with $p \leq 0.05$.

The Educatel Brazil study was approved by the Ethics Research Committee of the School of Medicine of UFMG (CAAE: 48129115.0.0000.5149).

Results

A total of 6,510 Brazilian schoolteachers were interviewed (85.2% response rate). Women constituted 63.2% of sample; 64% were 44 years old or younger (mean 40.3 ± 10.6 years); 92.2% had completed university or were in progress; 60.4% were married or lived with a partner; 66.7% had children; 51% were white and 43% were black or brown; 62.4% had a monthly income at the school of up to three times the minimum wage; and two-thirds worked in the Central, Southeast, and South of the country.

Current smoking prevalence was 4.4%. Among male teachers, prevalence was 5.9% and was higher in those over 55 years of age (10.7%). Prevalence was 3.5% in female teachers as a whole and 5.5% in those from 45 to 54 years of age. Former smokers accounted for 11.3% of the participants (those who answered "Yes" to the question "Are you now or have you ever been a smoker, that is, have you

smoked at least 100 cigarettes (five packs) in your life?” and “No” to the question “Do you smoke cigarettes now?”).

Figure 1 shows the regional differences in teachers’ smoking: prevalence rates of 16.9%, 12.7%, and 8.1% in São Paulo, Rio Grande do Sul, and Minas Gerais, respectively, and 0.4% in Roraima and Alagoas.

Among the sociodemographic characteristics, white men over 45 years of age that lived alone and had children showed higher smoking prevalence rates (Table 1). The univariate analysis further indicated a positive statistical association between smoking and university education (complete or under way), monthly income greater than three times the minimum wage, and living in regions of Brazil other than the Northeast (Table 1). As for health status, smoking was positively associated with insufficient physical activity, work absenteeism in the previous 12 months, and use of anxiolytics or antidepressants, and negatively associated with occasional voice problems at work (Table 1).

As for the characteristics of teaching work, a workweek exceeding 40 hours was positively associated with smoking, while longer commuting time to and from school and lack of classroom discipline were negatively associated with the outcome (Table 2). Among schoolteachers that took more than two hours to commute to and from school, 79.3% commuted by automobile, motorcycle, or public transportation, while the others walked, bicycled, or use some other form of transportation.

The final multivariate model included sociodemographic variables, health status, and an indicator for occupational stress. Female gender was inversely associated with smoking. Age was maintained in the final model, indicating that higher age is positively associated with smoking. Being married or living with a partner, occasional voice problems at work, and longer commuting time to and from school remained inversely associated with the outcome. Living in the South and Southeast of Brazil, insufficient physical activity, and use of anxiolytics or antidepressants were positively associated with smoking (Table 3).

Figure 1

Prevalence of smoking in Brazilian schoolteachers, 2016.

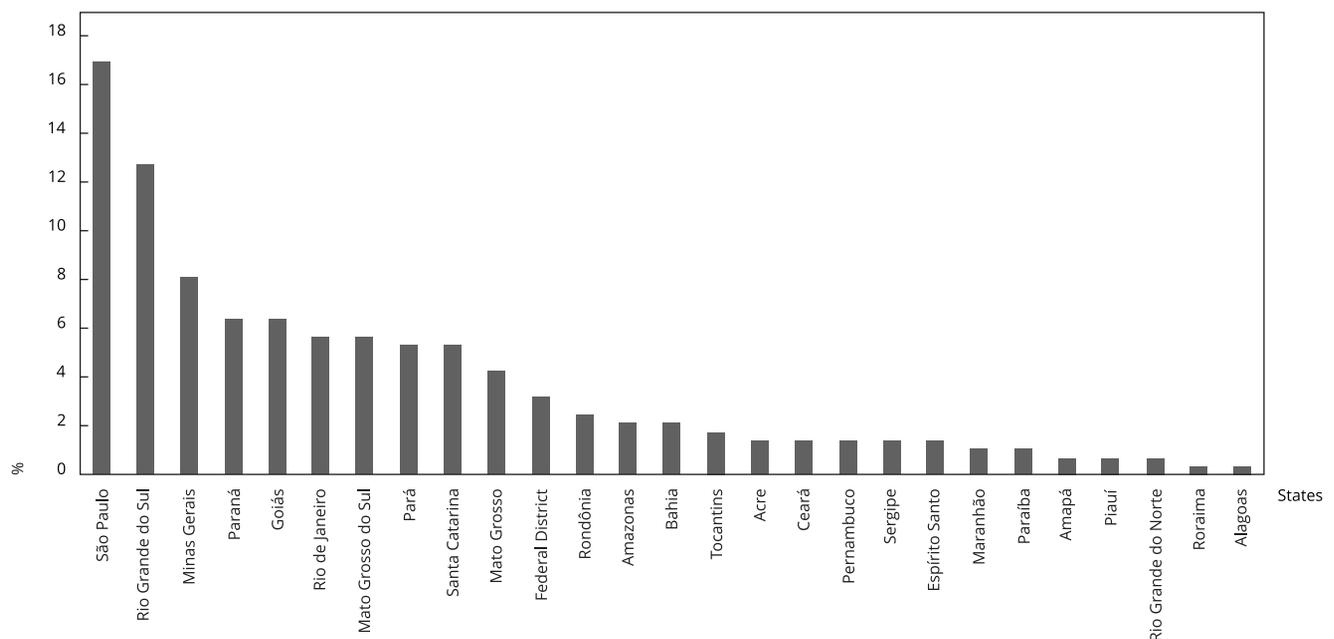


Table 1

Individual characteristics of Brazilian schoolteachers, 2016.

Variables	Non-smokers		Smokers		OR (95%CI)
	n	%	n	%	
Sociodemographic					
Gender					
Male	2,254	94.1	140	5.9	1.00
Female	3,972	96.5	144	3.5	0.58 (0.459-0.740)
Age (years)					
≤ 34	2,152	97.0	66	3.0	1.00
35-44	1,875	96.5	69	3.5	1.19 (0.851-1.691)
45-54	1,510	94.1	94	5.9	2.03 (1.471-2.799)
≥ 55	689	92.6	55	7.4	2.60 (1.801-3.760)
Education					
Primary or secondary *	494	96.7	16	3.1	1.00
University *	5,732	95.5	268	4.5	1.44 (0.864-2.410)
Marital status					
Without spouse/partner	2,429	94.3	146	5.7	1.00
With spouse/partner	3,797	96.5	138	3.5	0.60 (0.476-0.767)
Presence of children					
No	2,081	96.1	84	3.9	1.00
Yes	4,145	95.4	200	4.6	1.19 (0.921-1.550)
Sel-reported race					
White	3,162	95.2	158	4.8	1.00
Black or brown	2,691	96.1	109	3.9	0.81 (0.631-1.040)
Asian-descendant or indigenous	174	95.6	8	4.4	0.92 (0.444-1.902)
Other	199	95.7	9	4.3	0.91 (0.455-1.798)
Monthly income (minimum wage)					
≤ 3	3,899	96.0	163	4.0	1.00
> 3	2,327	95.1	121	4.9	1.24 (0.977-1.582)
Major geographi region					
Northeast	1,121	97.5	29	2.5	1.00
North	960	96.0	40	4.0	1.61 (0.990-2.617)
Central	1,242	95.8	55	4.2	1.71 (1.083-2.703)
South	1,323	95.0	69	5.0	2.02 (1.297-3.133)
Southeast	1,580	94.6	91	5.4	2.23 (1.455-3.405)
Health status					
Physical activity					
Sufficient	2,541	96.7	88	3.4	1.00
Insufficient	3,685	95.0	196	5.0	1.53 (1.188-1.984)
Missed work in the previous 12 months					
No	2,103	96.1	85	3.9	1.00
Yes	4,123	95.4	199	4.6	1.19 (0.921-1.547)
Voice problems at work					
No	5,027	95.4	242	4.6	1.00
Sometimes	915	96.9	29	3.1	0.65 (0.445-0.973)
Frequently	284	95.6	13	4.4	0.95 (0.537-1.682)

(continues)

Table 1 (continued)

Variables	Non-smokers		Smokers		OR (95%CI)
	n	%	n	%	
Health status					
Frequent loss of sleep due to worries					
No	4,170	95.8	181	4.2	1.00
Yes	2,056	95.2	103	4.8	1.15 (0.901-1.478)
Use of anxiolytics or antidepressants					
No	5,442	96.3	212	3.7	1.00
Yes	784	91.6	72	8.4	2.35 (1.785-3.111)
Self-rated health					
Good or very good	4,656	95.9	201	4.1	1.00
Regular	1,379	95.1	71	4.9	1.19 (0.903-1.573)
Bad or very bad	191	94.1	12	5.9	1.46 (0.798-2.652)

95%CI: 95% confidence interval; OR: odds ratio.

Source: Educatel Brazil ²¹.

* Concluded or under way.

Discussion

This is the first nationwide study in Brazil, representative of schools' census areas (rural versus urban), states, grade levels, and teachers' gender and age to examine a behavior that represents overall individual health and serves as an indicator of social inequalities.

Two groups of results stood out: the negative association between smoking, female gender, being married/living with a partner, occasional voice problems, and longer commuting time and the positive association with age, living in the South and Southeast regions of the country, insufficient physical activity, and use of anxiolytics or antidepressants.

Prevalence of smoking (4.4%) was similar to that among municipal schoolteachers in Maceió, Alagoas State (5.6%) ²⁵. However, when compared to other studies in Brazil, the prevalence rates in the current study were lower than among municipal preschool and primary schoolteachers in three other Brazilian cities: Ceballos & Santos ²⁶ found 9.9% of smokers among the 525 schoolteachers in a city in Pernambuco State; Fuess & Lorenz ²⁷ found 8.9% prevalence among 451 schoolteachers in a city in São Paulo State; and Santos & Marques ¹⁵ observed 14.1% smoking prevalence in 414 schoolteachers in a city in the State of Rio Grande do Sul. Furthermore, a study of 258 primary and secondary schoolteachers in nine state schools in two cities in the interior of São Paulo State found that 9.3% were smokers ¹⁶.

These differences may be due to regional specificities. The current study showed significant differences in smoking prevalence between regions of the country, with higher proportions in the South and Southeast when compared to the Northeast. The result confirms that "Brazil is a country with major economic, social, and cultural diversities that can impact the patterns of tobacco consumption" ²⁸ (p. 3714).

The regional differences evidenced here are in line with the results of the VIGITEL study. According to data for 2016, smoking prevalence in adults varied from 5.1% in Salvador, Bahia State, to 14% in Curitiba, Paraná State ³.

The low prevalence of smoking among teachers is consistent with the literature. A study in the United States compared 40 occupational groups, and schoolteachers were the profession that smoked the least ²⁹. The number of former smokers among American schoolteachers was also similar to our survey, with a nearly twofold proportion of former smokers compared to current smokers. Among Brazilian schoolteachers, there were 2.5 times more former smokers than current smokers.

Teachers' own educational level is also associated with smoking. In Brazil ^{3,30} and elsewhere in the world ³¹, prevalence of smoking is higher among individuals with less schooling. This is another factor that favors the low prevalence found here in Brazilian schoolteachers, with a sample that included 92.2% of teachers with university education (complete or under way).

Table 2

Work characteristics of Brazilian schoolteachers, 2016.

Variables	Non-smokers		Smokers		OR (95%CI)
	n	%	n	%	
Employment information					
Years working in basic education *					
< 10	2,316	96.4	87	3.6	1.00
10-20	2,051	96.1	83	3.9	0.94 (0.676-1.304)
> 20	1,859	94.2	114	5.8	0.98 (0.682-1.399)
Currently also working in another school					
No	3,153	95.8	138	4.2	1.00
Yes	3,073	95.5	146	4.5	1.08 (0.855-1.377)
Type of teaching contract					
Public admissions	2,271	95.4	110	4.6	1.00
Covered by labor legislation	180	96.3	7	3.7	0.80 (0.368-1.749)
Tenured, stable and private school system	1,886	96.0	78	4.0	0.85 (0.634-1.148)
Private school system	767	96.1	31	3.9	0.83 (0.555-1.253)
Temporary contract	1,122	95.1	58	4.9	1.06 (0.770-1.478)
Other paid work besides teaching					
No	5,486	95.7	246	4.3	1.00
Yes	740	95.1	38	4.9	1.14 (0.806-1.625)
Workweek > 40 hours					
No	2,575	96.2	103	3.9	1.00
Yes	3,651	95.3	181	4.7	1.24 (0.968-1.588)
Occupational stressors					
Commuting time to/from school (minutes)					
≤ 30	3,342	95.6	153	4.4	1.00
31-60	1,509	95.2	77	4.9	1.11 (0.841-1.475)
61-120	771	95.3	38	4.7	1.06 (0.738-1.529)
≥ 121	604	97.4	16	2.6	0.57 (0.339-0.964)
Loud noise in classroom					
No	2,314	95.7	105	4.3	1.00
yes	3,912	95.6	179	4.4	1.01 (0.788-1.290)
Lack of discipline in classroom					
No	1,921	95.0	101	5.0	1.00
Yes	4,305	95.9	183	4.1	0.79 (0.615-1.013)
Suffered verbal violence from students					
No	4,416	95.6	202	4.4	1.00
Yes	1,810	95.7	82	4.3	0.99 (0.761-1.287)
Suffered physical violence from students					
No	6,051	95.7	275	4.4	1.00
Yes	175	95.1	9	4.9	1.13 (0.572-2.235)
Heavy work demands					
No	2,832	95.8	123	4.2	1.00
Yes	3,394	95.5	161	4.5	1.09 (0.859-1.388)
Sufficient time to complete tasks					
Yes	3,680	95.9	159	4.1	1.00
No	2,546	95.3	125	4.7	1.13 (0.894-1.444)

95%CI: 95% confidence interval; OR: odds ratio.

Source: Educatel Brazil ²¹.

* Adjusted by age.

Table 3

Multivariate logistic regression with smoking as the dependent variable in Brazilian schoolteachers, 2016.

Variables	Adjusted OR (95%CI)
Sex	
Male	1.00
Female	0.46 (0.354-0.585)
Age (years)	
≤ 34	1.00
35-44	1.21 (0.854-1.725)
45-54	2.08 (1.495-2.898)
≥ 55	2.59 (1.774-3.772)
Marital status	
Without spouse/partner	1.00
With spouse/partner	0.53 (0.411-0.673)
Major geographic region	
Northeast	1.00
North	1.45 (0.886-2.373)
Central	1.53 (0.964-2.441)
South	1.98 (1.262-3.107)
Southeast	2.07 (1.347-3.187)
Physical activity	
Sufficient	1.00
Insufficient	1.66 (1.277-2.164)
Voice problems at work	
No	1.00
Sometimes	0.64 (0.429-0.954)
Frequently	0.92 (0.515-1.654)
Use of anxiolytics or antidepressants	
No	1.00
Yes	2.46 (1.841-3.295)
Commuting time to/from school (minutes)	
≤ 30	1.00
31-60	1.10 (0.823-1.459)
61-120	0.99 (0.686-1.442)
≥ 121	0.58 (0.344-0.993)

95%CI: 95% confidence interval; OR: odds ratio.

Source: Educatel Brazil ²¹.

Smoking was less common among women teachers. Studies have shown that women smoke less than men, regardless of the type of sample (overall population ³ or teachers ^{32,33,34,35}). The low prevalence of women smokers may be attributed to the social norm that establishes different male and female roles ^{6,33} according to what society expects and accepts from men and women.

Since early ages, social influences modulate the paths by which men, differently from women, cope with adversities and build their experience in the world, with impacts on patterns of illness: disease rates are higher in women, while early mortality tends to affect men more frequently ³⁶. Male mortality is historically due to smoking, alcohol abuse, occupational exposure to carcinogenic agents, traffic accidents, and violent deaths involving weapons ³⁷.

Marital status remained negatively associated with smoking, in keeping with other studies ^{6,32,35}. Married schoolteachers or those living with a partner showed lower smoking prevalence than those living alone. Companionship is a situation that fosters greater support and security to continue on

“life’s journey”, thereby constituting a barrier to recourse to negative coping strategies like substance use. The family exerts a well-documented influence on the success of smoking cessation strategies³⁸.

Schoolteachers that reported occasional voice problems at work showed lower prevalence of smoking. There is a known association between smoking and voice problems, such as voice fatigue, hoarseness, and clearing one’s throat^{39,40}. The presence of voice symptoms or alterations may lead the teacher to avoid adopting harmful behaviors or even to abandon them⁴¹. In this study, smoking prevalence was also lower in schoolteachers that reported frequent voice problems at work, but the difference was not statistically significant.

Longer commuting time to and from school showed a negative association with smoking, indicating that teachers who took longer to commute tended to smoke less. This result was unexpected. The duration of commuting adds time to the workday, considering the time dedicated to work, which can be considered a stressor, which would increase the odds of substance use¹⁴. The fact that longer commuting time was associated with lower prevalence of smoking could be explained by the impossibility of smoking during automobile or motorcycle commuting or on public transportation, the means used by 79.3% of schoolteachers that reported longer commuting time to and from school.

There was a higher prevalence of smoking, with an upward gradient, among teachers over 45 years of age. In short, the older the individual, the lower the smoking rate. The results corroborate those of a study on the overall population: according to data from the VIGITEL study in 2016, smoking prevalence was higher in adults from 45 to 64 years of age³.

The lower proportion of smokers among teachers with sufficient physical activity can be interpreted as an expected gain among those that have already manifested better adherence to healthy habits. In other words, it is consistent with adherence to physical activity to be less prone to unhealthy habits such as tobacco consumption³⁸.

The group that reported use of anxiolytics or antidepressants in the four weeks prior to the survey showed a high prevalence of smoking when compared to individuals that had not used such medications during the same period. Prevalence of smoking is known to be higher in patients with mental disorders⁴². Smoking may also act here as a negative strategy for coping with emotional tensions by individuals with anxiety and depressive disorders^{43,44}.

Previous studies have pointed to associations between psychosocial job demands and intensity of tobacco consumption, attempts at smoking cessation, and relapses after attempts at quitting^{10,45}. Unexpectedly, even when included among the independent variables, work conditions and demands at schools did not reach statistical significance in relation to smoking in this study (which does not mean that the teachers considered their work conditions adequate). Most schoolteachers in the sample had workweeks exceeding 40 hours and identified the following occupational stressors: loud noise and lack of discipline in the classroom and heavy work demands.

One can logically assume that the reduction in smoking prevalence in Brazilian schoolteachers is partly due to the country’s tobacco control initiatives, which have been acknowledged as efficacious in the general population⁴. The specific case of schoolteachers suggests the hypothesis that health promotion activities in schools^{7,8} have contributed to the drop in the number of smokers, even in the presence of occupational stressors that might otherwise maintain or increase the smoking rate among teachers.

Health promotion activities in Brazilian schools include a ban on tobacco use in schools by teachers and school staff, in addition to visitors and the students themselves. A systematic literature review that included 26 studies in different tobacco-free environments associated the ban on smoking with the reduction in prevalence of smoking or with the decrease in cigarette consumption by workers⁴⁶. In Japan, the results of a study with 1,534 teachers in tobacco-free schools suggest that restrictions on smoking produce two-way effects, by protecting students from becoming passive or active smokers while encouraging schoolteachers to cut down or quit smoking⁴⁷.

Study limitations and strengths

The current study has some limitations to consider when analyzing the results: the inclusion of only healthy workers (since teachers on leave were excluded from the data collection); the cross-sectional design, which produce an image of health status characteristic of a specific moment in time and

reduces the possibility of drawing causal inferences between the target factors; recall bias; and lack of direct contact with the interviewer. There was also a lack of complementary information on smoking: age at initiation and time transpired (in years), number of cigarettes consumed, and history of any previous attempts to quit.

The study's strengths also deserve mentioning. The survey achieved a nationwide scope and included a sample that represented all Brazilian schoolteachers in basic education, regardless of the schools' location or size. The questionnaire used in the data collection was based on an extensive literature review that allowed the researchers to produce an explanatory manual on the questions and conduct validity tests to measure the answers' internal consistency²⁴.

Since face-to-face interviews allow for clarifying questions and answers, they are generally considered advantageous in comparison to remote interviews. However, in this study the relative disadvantage of telephone interviews was outweighed by the gain in scope, agility, and cost reduction, allowing to reach a sample representing the more than two million teachers working in basic education in Brazil²³.

Conclusion

Prevalence of smoking in Brazilian schoolteachers was relatively low in comparison both to the general population and to local samples of teachers. Factors such as gender, age, marital status, geographic region, physical activity, voice problems, use of medications, and commuting time to and from school were associated statistically with smoking in the study group. Unexpectedly, other occupational stressors did not remain associated with smoking, even though the majority of the schoolteachers reported loud noise and lack of discipline in the classroom, in addition to heavy work demands. The results highlight the need to continue and expand initiatives with the potential to generate two-way effects, by protecting students from becoming smokers and encouraging schoolteachers to cut down or quit smoking. Future studies may consider investigating the intensity of cigarette consumption, attempts to quit, and the association between smoking and other factors such as the use of alcohol and illicit drugs, overall school and classroom conditions, and shortage of teaching materials.

Contributors

R. E. C. Barbosa participated in the data analysis and interpretation, writing of the manuscript, and revision of the final version. G. C. Fonseca participated in the data interpretation, writing of the manuscript, and revision of the final version.

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Additional informations

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Resumo

Estudo transversal que investigou a prevalência e os fatores associados ao tabagismo em uma amostra aleatória e representativa de 6.510 professores da Educação Básica brasileira. Os dados foram obtidos por meio de questionários aplicados por telefone, contendo informações sociodemográficas, estado de saúde, afastamentos do trabalho e características do trabalho docente. O tabagismo foi analisado como variável dicotômica por meio de regressão logística univariada e multivariada. A prevalência de fumantes atuais foi de 4,4%. Entre os homens, a prevalência foi de 5,9%, sendo maior na faixa etária acima de 55 anos (10,7%). Para as mulheres, a taxa foi de 3,5% e maior na faixa etária entre 45 e 54 anos (5,5%). O modelo final da análise multivariada evidenciou associação negativa entre tabagismo e sexo feminino (OR = 0,46), viver acompanhado (OR = 0,53), problemas ocasionais no trabalho por causa da voz (OR = 0,64) e maior tempo de deslocamento entre a casa do professor e a escola (OR = 0,58). Foi encontrada associação positiva entre o desfecho e maior idade (OR = 2,59), viver nas regiões Sul (OR = 1,98) e Sudeste (OR = 2,07), insuficiência de atividades físicas (OR = 1,66) e o uso de ansiolíticos ou antidepressivos (OR = 2,46). A prevalência de tabagismo entre os professores da Educação Básica no Brasil foi relativamente baixa. Contrariamente ao esperado, apesar de indicadas como inadequadas pelos entrevistados, condições e demandas de trabalho nas escolas não alcançaram significância estatística em relação ao tabagismo no presente estudo.

Fumar; Professores Escolares; Estudos Transversais

Resumen

Estudio transversal que investigó la prevalencia y factores asociados al tabaquismo en una muestra aleatoria y representativa de 6.510 profesores de Educación Básica brasileña. Los datos se obtuvieron mediante cuestionarios aplicados por teléfono, conteniendo información sociodemográfica, estado de salud, bajas laborales y características del trabajo docente. El tabaquismo fue analizado como variable dicotómica mediante regresión logística univariada y multivariada. La prevalencia de fumadores actuales fue de un 4,4%. Entre los hombres, la prevalencia fue de un 5,9%, siendo mayor en la franja etaria por encima de 55 años (10,7%). Para las mujeres, la tasa fue de 3,5 % y mayor en la franja etaria entre 45 y 54 años (5,5%). El modelo final del análisis multivariado evidenció una asociación negativa entre tabaquismo y sexo femenino (OR = 0,46), vivir acompañado (OR = 0,53), problemas ocasionales en el trabajo por causa de la voz (OR = 0,64), y mayor tiempo de desplazamiento entre la casa del profesor y la escuela (OR = 0,58). Se encontró una asociación positiva entre el resultado y mayor de edad (OR = 2,59), vivir en las regiones Sur (OR = 1,98) y Sudeste (OR = 2,07), insuficiencia de actividades físicas (OR = 1,66) y el uso de ansiolíticos o antidepressivos (OR = 2,46). La prevalencia de tabaquismo entre los profesores de Educación Básica en Brasil fue relativamente baja. Contrariamente a lo esperado, a pesar de ser indicadas como inadecuadas por los entrevistados, las condiciones y demandas de trabajo en las escuelas no alcanzaron significancia estadística, en relación con el tabaquismo en el presente estudio.

Fumar; Maestros; Estudios Transversales

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