Smoking among industrial workers in Brazil: association with sociodemographic factors, alcohol consumption, and stress levels

Pablo Magno da Silveira, Kelly Samara da Silva, Gabrielli Thais de Mello, Margarethe Thaisi Garro Knebel, Adriano Ferreti Borgatto, Markus Vinicius Nahas

ABSTRACT

Objective: To determine the prevalence of smoking, as well as its association with sociodemographic factors, alcohol consumption, and stress levels, among industrial workers in Brazil. Methods: This was a nationwide survey, conducted in 24 capitals in Brazil through the application of a pre-tested questionnaire. The response to the question “What is your smoking status?” was the outcome variable. To determine the associations, we performed Poisson regression analyses in which the inputs were blocks of variables: block 1 (age and marital status); block 2 (level of education and gross family income); block 3 (geographic region); and block 4 (alcohol consumption and stress level). All analyses were stratified by gender. Results: The sample consisted of 47,328 workers ≥ 18 years of age, of whom 14,577 (30.8%) were women. The prevalence of smoking was 13.0% (15.2% in men and 7.9% in women). Advancing age, alcohol consumption, and a high stress level were positively associated with smoking. A lower risk of smoking was associated with being married, having a higher level of education, and living in the northeastern region of the country (versus the southern region). Conclusions: The prevalence of smoking was greater in men than in women. Alcohol consumption and high stress levels appear to promote smoking.

Keywords: Tobacco use disorder/epidemiology; Tobacco smoking; Occupational health; Industry; Brazil.

INTRODUCTION

Smoking is an important risk factor for various morbidities and is associated with early onset of cardiovascular diseases, respiratory diseases, some types of cancer, stroke, and increased mortality. Nevertheless, 928 million men and 207 million women smoke.

In Brazil, data from a nationwide telephone survey demonstrated a decrease in the prevalence of smokers ≥ 18 years of age: from 15.6% in 2006 to 10.8% in 2014. In 2017, this prevalence was close to 10%, being higher among men than among women (13.2% vs. 7.5%). Therefore, smoking differs by sociodemographic factors, such as gender and economic status. Studies have indicated that adult men with a low family income and a low level of education are more likely to smoke. In addition, certain risk conditions, such as alcohol consumption and stress levels, appear to be directly related to smoking.

It remains unknown whether the behaviors seen in the general population manifest themselves in the same pattern among industrial workers, because the circumstances of this social group are known to be determined by social, economic, and organizational factors, as well as by working/living conditions and specific occupational risk factors.

Surveillance of these various factors, in parallel with monitoring of smoking, knowledge of the deleterious effects of smoking, and understanding of the importance of prevention can potentiate the development and implementation of anti-smoking policies in the workplace, such as the 2011 Anti-Smoking Law. These actions are aimed at reducing the health harms caused by and the more serious consequences of smoking, such as the onset of morbidities and early mortality attributable to tobacco use.

Considering that industrial workers correspond to a specific class of Brazilian adult workers, who have different work routines, we sought to assess whether exposures to alcohol consumption and stressful situations are associated with smoking. Therefore, the objective of the present study was to determine the prevalence of smoking, as well as its association with sociodemographic factors, alcohol consumption, and stress levels, among industrial workers in Brazil.

METHODS

The present study is part of a nationwide survey entitled “Lifestyle and Leisure Habits of Industrial workers”, which received financial support from the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES, Office for the Advancement of Higher Education) – Finance Code 001 and the Serviço Social de Indústria (SESI, Brazilian Industrial Social Services).
Smoking among industrial workers in Brazil: association with sociodemographic factors, alcohol consumption, and stress levels

carried out by the Brazilian Serviço Social da Indústria (SESI, Industrial Social Services Agency) in partnership with the Federal University of Santa Catarina Center for Research on Physical Activity and Health, between 2006 and 2008, with the participation of 24 of the 27 federal units in Brazil. This was a representative study of Brazilian industrial workers in Brazilian capitals. The states of Rio de Janeiro, Piauí, and Sergipe did not participate in the survey in a timely manner.

In 2006, Brazil had approximately 5,293,000 industrial workers. For the survey, each regional department of the SESI provided worker registration information and information on the number of workers at each company in the state it represented. Information on population size was provided by each regional department, and, on the basis of those data, we calculated the sample size using the following parameters: an estimated prevalence of leisure time physical inactivity of 45%, obtained from a survey conducted in Santa Catarina, the main purpose of which was to identify the prevalence of leisure time physical inactivity; a sampling error of 3%; and a confidence interval of 95%. The minimum sample size was then increased by 50% as a strategy to attenuate the effects of the sampling design; subsequently, the sample size was increased by an additional 20% to account for potential losses during the data collection process. The total sum of samples from all regional departments was 52,774 workers. The sampling plan was developed separately in each regional department, in two stages: random selection of companies, considering the distribution of workers in companies by company size—small (20-99 workers), medium (100-499 workers), and large (≥ 500 workers)—10-50% of small, medium, and large companies being selected depending on the number of existing companies and the required number of patients for the sample; and random selection (systematic sampling) of workers in each of the companies selected in the previous phase of the sampling process. The sampling plan was then sent to each regional department, so that the companies could be contacted and the questionnaires could be administered. Companies that did not allow the administration of the questionnaires were replaced with companies of the same size and, when possible, in the same industry. Workers who were absent or on leave were replaced by choosing the next name on the employee list provided by the company. More details can be found in a previous publication.

The data in the present study were collected using a self-report questionnaire with 58 questions. Content and logic validity were checked. Kappa index values and intraclass correlation coefficients ranged from 0.40 to 0.79. For the present study, 9 items of the questionnaire were used: tobacco use ("What is your smoking status?"; alcohol consumption ("How many alcoholic drinks do you consume in a typical week?"); stress level ("How would you rate the stress level in your life?"); geographic region of the regional department of the SESI; gender; age; marital status (married/
Silveira PM, Silva KS, Mello GT, Knebel MTG, Borgatto AF, Nahas MV

(Table 3), the following variables remained associated with smoking: age group (30-39 years and ≥ 40 years); marital status (married); level of education (high school graduate and college graduate); geographic region (northeastern and northern); weekly alcohol consumption (1-7 drinks and ≥ 8 drinks); and stress level (almost always/always stressed).

### DISCUSSION

In the present study, 1 in every 10 female industrial workers and 2 in every 10 male industrial workers smoked. The association analyses indicated that being > 30 years of age, consuming alcohol, and having a high stress level were associated with a higher prevalence of smoking in men and women, whereas living in the South or North was associated with a higher prevalence of smoking only in men. In contrast, having a higher level of education and being married were associated with a lower prevalence of smoking, regardless of gender. Having an intermediate family income (R$601-1,500) and living in the northeastern region of the country were associated with a lower prevalence of smoking in men, whereas living in the northeastern or northern region was associated with a lower prevalence of smoking in women.

Between 1990 and 2015, the prevalence of smoking declined considerably in the Brazilian population, and that decline can be attributed to control, regulation, and prevention policies. As an example, we highlight the National Program for Smoking Control, which has the objective of reducing the prevalence of smoking through a model in which educational, communication, and health care interventions, as well as legislative and economic measures, work in concert to prevent smoking initiation, promote smoking cessation, and...
Smoking among industrial workers in Brazil: association with sociodemographic factors, alcohol consumption, and stress levels

The present study showed that men smoke more than women, corroborating data in the literature, which suggest that this is attributable to the fact that women adopt healthier lifestyles and take better care of their health, consequently making more positive health choices.\(^{20,21}\)

The relationship between smoking and age found among industrial workers appears to be similar to that reported for the general population.\(^{3,11}\) Data from a survey conducted in Brazil in 2017\(^{4}\) indicate that the prevalence of smoking among adults is higher in the 45- to 54-year age group (11.2%) than in the 18- to 24-year age group (8.5%). Although youth is the period of life when most people have their first experiences with cigarettes, young people smoke less in Brazil, a possible reflection of campaigns and interventions aimed at nonsmokers\(^{22}\) and of intersectoral public policies, such as the School Health Program and the Health Knowledge Program, which address smoking prevention in schools.\(^{23}\) In addition, Brazilian law acts to reduce access of young people to tobacco, prohibiting the sale of cigarettes to minors, the advertisement of tobacco products in the media, and tobacco industry sponsorship of sporting and cultural events.\(^{19}\) Furthermore, an industrialized goods tax has been put on cigarettes, which has increased the retail price.\(^{24}\)

Our results show that marital status was associated with smoking, indicating that being married/living with a partner is a protective factor against smoking. Several explanations for this emerge from the assumption that marital relationships appear to produce a series of results

Table 1. Smoking prevalence, by demographic and socioeconomic variables, alcohol consumption, and stress levels, among industrial workers (N = 47,328). Brazil, 2006-2008.

| Variable                      | Sample size, n | Smoking, % | Smoking, % |
|-------------------------------|----------------|------------|------------|
| Smoking                       | 47,328         | 6,163      | 13.02      | 100.0      |
| Gender                        | 47,328         | 1,126      | 7.89       | 18.27      |
| Men                           |                | 5,037      | 15.24      | 81.73      |
| Age, years                    | 47,142         | 2,317      | 10.66      | 37.79      |
| < 30                          |                | 1,921      | 13.16      | 31.33      |
| 30-39                         |                | 1,893      | 17.53      | 30.88      |
| ≥ 40                          |                |            |            |            |
| Marital status                | 47,211         | 2,577      | 12.49      | 41.96      |
| Married                       |                | 3,564      | 13.41      | 58.04      |
| Level of education            | 47,230         | 1,963      | 21.98      | 31.92      |
| < 9 years of schooling        |                | 2,374      | 9.84       | 38.61      |
| 9 years of schooling          |                | 602        | 8.88       | 9.79       |
| Gross family income\(^c\)     | 46,872         | 2,358      | 15.69      | 38.66      |
| ≤ R$600                       |                | 2,380      | 12.26      | 39.02      |
| R$601-1,500                   |                | 1,362      | 10.95      | 22.33      |
| ≥ R$1,501                     |                |            |            |            |
| Geographic region             | 47,328         | 721        | 12.03      | 11.70      |
| Southeast                     |                | 924        | 13.03      | 14.99      |
| South                         |                | 1,130      | 13.89      | 18.34      |
| Central-West                  |                | 1,555      | 10.71      | 25.23      |
| Northeast                     |                | 1,833      | 15.80      | 29.74      |
| Alcohol consumption\(^d\)     | 47,052         | 2,186      | 8.06       | 35.65      |
| 0 drinks                      |                | 2,826      | 17.32      | 46.09      |
| 1-7 drinks                    |                | 1,119      | 31.12      | 18.25      |
| ≥ 8 drinks                    |                |            |            |            |
| Stress levels\(^e\)           | 47,205         | 5,069      | 12.45      | 82.48      |
| Rarely/sometimes stressed     |                | 1,077      | 16.57      | 17.52      |

\(^c\)R$: Brazilian reals. \(^a\)Smoking prevalence relative to the sample as a whole. \(^b\)Proportion of the total number of smokers. \(^d\)The national monthly minimum wage was R$350 in 2006, R$380 in 2007, and R$415 in 2008. \(^e\)Number of drinks consumed per week. \(^f\)Perceived stress levels over time.
due to the acquisition of different health behaviors, the greater social support received by married subjects apparently promoting smoking cessation, whereas subjects who do not have a partner are more prone to loneliness, have less social support, and experience high levels of stress due to a break-up, all of which may stimulate smoking.\(^{25}\)

In the present study, the prevalence of smoking was inversely proportional to the level of education, in both genders. This result corroborates the findings of a previous study profiling the Brazilian population, in which the proportion of smokers was shown to be lower among individuals, of either gender, with a higher level of education.\(^{4}\) In studies conducted in other countries, such as Russia\(^{26}\) and India,\(^{27}\) a similar relationship has been observed between educational variables and smoking. In this regard, we emphasize the importance of understanding the factors that influence the adoption of healthy lifestyles and the extent to which the various smoking control interventions reach men and women in different social strata and with different levels of education.\(^{28}\)

In our study, none of the family income categories were associated with smoking in either gender. Regardless, the impact that spending has on overall family income appears to differ across income brackets, given that higher-income individuals spend proportionately less on tobacco products, while having greater access to resources for smoking cessation.\(^{29}\)

When analyzing smoking among industrial workers in Brazil by geographic region, we found that, for both genders, workers in the northeastern region were at a lower risk of smoking than were those in the southeastern region. In addition, among women, those in the northern region of the country were at a lower risk of smoking than were those in the southeastern region. A study of adults in Brazil found that the prevalence of daily smoking ranged from 12.8% in the northern region to 17.4% in the southern region.\(^{30}\) This finding may explain to some extent the higher

---

Table 2. Smoking prevalence and smoking prevalence ratios, by demographic and socioeconomic variables, alcohol consumption, and stress levels, among male industrial workers (N = 5,037), Brazil, 2006-2008.

| Variable                      | Sample Size, n | n (%) | Crude PR (95% CI) | p   | Adjusted PR (95% CI) | p   |
|-------------------------------|----------------|-------|-------------------|-----|---------------------|-----|
| Age, years                    | 5,011          |       |                   |     |                     |     |
| < 30                          | 1,934 (38.6)   | 1.00  | 1.00              | < 0.001 | 1.00               | < 0.001 |
| 30-39                         | 1,540 (30.8)   | 1.18 (1.10-1.26) | 1.22 (1.14-1.31) | 0.016 |                     |     |
| ≥ 40                          | 1,537 (30.6)   | 1.49 (1.40-1.60) | 1.55 (1.45-1.67) | < 0.001 | 0.68               | 0.002 |
| Marital status                | 5,015          |       |                   |     |                     |     |
| Other                         | 1,916 (38.2)   | 1.00  | 1.00              |     |                     |     |
| Married                       | 3,099 (61.8)   | 1.04 (0.98-1.10) | 0.91 (0.85-0.97) |     |                     |     |
| Level of education\(^{a}\)    | 5,023          |       |                   |     |                     |     |
| < 9 years of schooling        | 1,719 (34.3)   | 1.00  | 1.00              |     |                     |     |
| 9 years of schooling          | 1,026 (20.4)   | 0.76 (0.71-0.83) | 0.80 (0.74-0.87) |     |                     |     |
| High school graduate          | 1,864 (37.0)   | 0.48 (0.45-0.51) | 0.51 (0.48-0.55) |     |                     |     |
| College graduate              | 414 (8.3)      | 0.46 (0.42-0.52) | 0.47 (0.41-0.53) |     |                     |     |
| Gross family income\(^{a,b}\) | 4,990          |       |                   | < 0.001 | 0.228              |     |
| ≤ R$600                       | 1,947 (39.0)   | 1.00  | 1.00              |     |                     |     |
| R$601-1,500                   | 1,982 (39.7)   | 0.80 (0.75-0.85) | 0.91 (0.85-0.97) |     |                     |     |
| ≥ R$1,501                     | 1,061 (21.3)   | 0.72 (0.67-0.77) | 0.96 (0.88-1.05) |     |                     |     |
| Geographic region\(^{c}\)    | 5,037          |       |                   | < 0.001 | 0.015              |     |
| Southeast                     | 546 (10.8)     | 1.00  | 1.00              |     |                     |     |
| South                         | 658 (13.1)     | 1.15 (1.03-1.29) | 1.16 (1.03-1.30) |     |                     |     |
| Central-West                  | 916 (18.2)     | 1.16 (1.05-1.30) | 1.04 (0.93-1.16) |     |                     |     |
| Northeast                     | 1,278 (25.4)   | 0.92 (0.83-1.02) | 0.84 (0.76-0.93) |     |                     |     |
| North                         | 1,639 (32.5)   | 1.40 (1.27-1.54) | 1.26 (1.14-1.39) |     |                     |     |
| Alcohol consumption\(^{d,e}\) | 5,013          |       |                   | < 0.001 | < 0.001            |     |
| 0 drinks                      | 1,537 (31.4)   | 1.00  | 1.00              |     |                     |     |
| 1-7 drinks                    | 2,387 (47.6)   | 1.90 (1.78-2.02) | 1.94 (1.82-2.07) |     |                     |     |
| ≥ 8 drinks                    | 1,053 (21.0)   | 3.26 (3.01-3.52) | 3.24 (2.99-3.51) |     |                     |     |
| Stress levels\(^{e,f}\)      | 5,022          |       |                   | < 0.001 | < 0.001            |     |
| Rarely/sometimes stressed     | 4,233 (84.3)   | 1.00  | 1.00              |     |                     |     |
| Almost always/always stressed | 789 (15.7)     | 1.36 (1.26-1.46) | 1.29 (1.19-1.39) |     |                     |     |

PR: prevalence ratio; and R$: Brazilian reals. \(^{a}\)Adjusted for age and marital status. \(^{b}\)The national monthly minimum wage was R$350 in 2006, R$380 in 2007, and R$415 in 2008. \(^{c}\)Adjusted for age, marital status, level of education, and gross family income. \(^{d}\)Weekly. \(^{e}\)Adjusted for age, marital status, level of education, gross family income, and geographic region. \(^{f}\)Perceived stress levels over time.
prevalence of smoking in the southern region, because two of the three states in this region, Rio Grande do Sul and Santa Catarina, are responsible for most of the national production of tobacco, which may be leading to higher tobacco use in this region. In addition, the higher tobacco use in this region may be attributed to cultural factors, such as the strong influence of its European immigrants and its proximity to countries such as Argentina and Uruguay, where the prevalence of smoking is close to 30%. Likewise, some prevalence studies coordinated by the Brazilian federal government also report that the number of smokers is higher in the southern region.  

With regard to alcohol consumption, we found that an increase in the number of drinks consumed per week was paralleled by an increase in the prevalence of smoking. This finding is similar to those reported in other studies in Brazil, which assessed associations in risk behaviors in adults. A study that monitored the prevalence of health-related characteristics and behaviors in the United States, Guam, Puerto Rico, and the Virgin Islands found that smokers are more likely to drink compulsively than are former smokers or nonsmokers. Therefore, the co-use of alcohol and nicotine leads to a greater desire to consume both substances. The nature of the relationship between nicotine and alcohol suggests that the severity of dependence on these drugs should be considered jointly. According to the World Health Organization, there is a growing worldwide trend toward people using various psychoactive substances together and at different times, leading to increased health risks.  

The findings of the present study showed that the prevalence of smoking was higher among workers with higher stress levels, for both genders. This bidirectional relationship can occur, as reported in a study of occupational stress among bank workers that found smoking was significantly associated with stress. It is plausible that this relationship is due to occupational pressure resulting from the precariousness of employment, an accumulation of
duties, and increased responsibility, all of which imply susceptibility to stress, reinforcing tobacco use.

Our study has some limitations. First, the results are dependent on the criterion used to define “smoking,” and comparisons should consider this aspect. Second, the data are representative of industrial workers in Brazilian capitals and may not reflect the reality of workers in other locations or other work settings. Third, the data are representative of a 2006-2008 scenario and may not portray the current situation. Finally, the sample specifically included adult workers, therefore not being representative of the elderly population.

The current debate on occupational health should consider the ongoing changes in the world of labor, so that the lifestyle of workers can be improved. Our results showed that the behavior of variables such as gender, age, level of education, alcohol consumption, and stress levels among industrial workers is similar to that found in the general population, indicating that the understanding may be similar. Nevertheless, further studies, such as longitudinal surveys that allow monitoring of the real impact of these and other variables on smoking in this population and intervention studies that allow testing of interventions for behavior change, should be encouraged.

In summary, our study revealed that 1 in every 10 industrial workers is smoking, the prevalence of smoking being higher in men and in workers > 30 years of age. In addition, alcohol consumption and high stress levels are factors that potentiate smoking.

AUTHOR CONTRIBUTIONS

PMS and KSS participated in the study design, assisted in the literature review and in the interpretation of data, participated in the writing and critical review of the manuscript, and approved the final version. GTM and MTGK participated in the study design, assisted in the analysis and interpretation of data, participated in the writing and critical review of the manuscript, and approved the final version. AFB and MVN prepared and coordinated the project, collected the data, participated in the writing and critical review of the manuscript, and approved the final version.

REFERENCES

1. World Health Organization. The global burden of disease: 2004 update. Geneva: World Health Organization; 2004.
2. World Health Organization. World health statistics 2014. Geneva: World Health Organization; 2014.
3. Malta DC, Stopa SR, Santos MAS, Andrade SSCA, Oliveira TP, Cristo EB, et al. Evolution of tobacco use indicators according to telephone surveys, 2006-2014. Cad Saude Publica. 2017;33(Suppl 3):e00134915. https://doi.org/10.1590/0102-311X00134915
4. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância de Doenças e Agravos não Transmissíveis e Promoção de Saúde [homepage on the Internet]. Brasília: Ministério da Saúde; [cited 2018 Oct 8]. Vigilância Brasil 2017: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico; 2018. [Adobe Acrobat document, 133p.]. Available from: http://bvsms.saude.gov.br/bvs/publicacoes/vigilancia_fatores_riscos.pdf
5. Islami F, Torre LA, Jemal A. Global trends of lung cancer mortality and smoking prevalence. Transl Lung Cancer Res. 2015;4(4):327-38.
6. Agaku IT, King BA, Dube SR; Centers for Disease Control and Prevention (CDC). Current cigarette smoking among adults - United States, 2005-2012. MMWR Mortal Wkly Rep. 2014;63(2):23-34.
7. Gilbert DG, McClemon FJ, Gilbert BD. The psychology of the smoker. In: Bollerin G, Fagerström KO, editors. The tobacco epidemic. Basel: Karger; 1997. https://doi.org/10.1159/000062070
8. Opaleye ES, Sanchez ZM, Moura YG, Galduróz JC, Locatelli DP, Noto AR. The Brazilian smoker: a survey in the largest cities of Brazil. Braz J Psychiatry. 2012;34(1):43-51. https://doi.org/10.1590/S1516-44622012000100009
9. Picaluga IF, Saúde e Trabalho. In: Instituto Brasileiro de Análises Sociais e Econômicas. Saúde e Trabalho no Brasil. São Paulo: Vozes; 1983.
10. Brasil. Ministério da Saúde. Instituto Nacional de Câncer José Alencar Gomes da Silva (INCA) [homepage on the Internet]. Rio de Janeiro: INCA; [cited 2018 Oct 16]. Prevenção de Tabagismo 2018. Available from: http://www2.inca.gov.br/pvs/vcm/nectab/observatorio_controle_tabaco/site/home/objetivos/prev_en/prevenica_tabagismo
11. Malta DC, Vieira ML, Szwarcwald CL, Caixeta R, Brito SM, Dos Reis AA dos, et al. Smoking Trends among Brazilian population - National Household Survey, 2008 and the National Health Survey, 2013. Rev Bras Epidemiol. 2015;18 Suppl 2:45-56. https://doi.org/10.1590/1980-5497201500060005
12. Sardinha A, Oliva AD, D’Augustin J, Ribeiro F, Falcone EM. Intervenção cognitivo-comportamental com grupos para o abandono do cigarro. Rev Bras Ter Cogn. 2005;10(1):83-90.
13. LeiAntifumo [homepage on the Internet]. Brasília: Ministério da Saúde; [cited 2018 Oct 8]. Brasil. Lei Antifumo no 12.546/2011. Available from: http://portalanuarios.saude.gov.br/campenhas/leiantifumo/index.html
14. Britton J. Death, disease, and tobacco Lancet. 2017;389(10082):1861-1862. https://doi.org/10.1016/S0140-6736(17)30867-X
15. Nahas MV, Barros M, Oliveira E, Aguair F da S. Estilo de vida e hábitos de lazer dos trabalhadores das indústrias brasileiras: relatório geral. Brasília; SESI; 2009.
16. Brasil. Instituto Brasileiro de Geografia e Pesquisa (IBGE) [homepage on the Internet]. Rio de Janeiro: IBGE; [cited 2018 Nov 7]. Pesquisa Industrial Anual 2006. Available from: https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&cod=71719
17. Barros MViG. Atividades físicas no lazer e outros comportamentos relacionados à saúde dos trabalhadores da indústria no Estado de Santa Catarina, Brasil [dissertation]. Florianópolis: Centro de Desportos, Universidade Federal de Santa Catarina; 1999.
18. Dumith SC. Proposta de um modelo teórico para a adoção da prática de atividade física. Rev Bras Atividade Física Saúde. 2008;13(2):52-82.
19. Instituto Nacional do Câncer [homepage on the Internet]. Rio de Janeiro: INCA; [updated 2016 Jul 28; cited 2018 Sep 4]. Observatório da Política Nacional de Controle do Tabaco; [about 18 screens]. Available from: http://www2.inca.gov.br/pvs/vcm/vcm/connect/observatorio_controle_tabaco/site/status_politica/a_politica_nacional
20. Vitor IO, Brevidelli MM, Coutinho RMC. Prevalence of risk factors for nontransmitted chronic disease in nursing students: gender differences. J Health Sci Inst. 2014;34(3):390-5.
21. Paes NL. Economic factors and gender differences in the prevalence of smoking among adults [Article in Portuguese]. Cienc Saúde Colet. 2016;21(1):53-61. https://doi.org/10.1590/1413-8123201521.00162015
22. Kuhnen M, Boing AF, Oliveira MC de, Longo GZ, Njaine K. Tabagismo e fatores associados em adultos: um estudo de base populacional. Rev Bras Epidemiol. 2009;12(4):615-626. https://doi.org/10.1590/S1415-790X2009000400011
23. Falcão TJ, Costa Ido C. Smoking in a small city: an ethnographic study to serve as a base for the creation of a public health program. J Bras Pneumol. 2008;34(2):91-7. https://doi.org/10.1590/S1808-3713200800200005

J Bras Pneumol. 2020;46(1):e20180395
24. Brasil. Presidência da República. Secretaria-Geral. Subchefia para Assuntos Jurídicos [homepage on the Internet]. Brasília: a Presidência [cited 2018 Aug 19]. Decreto no. 8656, de 29 de janeiro de 2016; [about 4 screens]. Available from: http://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2016/Decreto/D8656.htm

25. Umberson D, Montez JK. Social relationships and health: a flashpoint for health policy. J Health Soc Behav. 2010;51 Suppl:S54-66. https://doi.org/10.1177/0022146510383501

26. Perlman F, Bobak M, Gilmore A, McKee M. Trends in the prevalence of smoking in Russia during the transition to a market economy. Tob Control. 2007;16(5):299-305. https://doi.org/10.1136/hc.2006.019455

27. Gupta PC, Ray CS. Tobacco, education & health. Indian J Med Res. 2007;126(4):289-99.

28. Malta DC, Cezário AC, Moura L, Morais Neto OL, Silva Júnior JB. A construção da vigilância e prevenção das doenças crônicas não transmissíveis no contexto do Sistema Único de Saúde. Epidemiol Serv Saúde. 2006;15(3):47-65. https://doi.org/10.5123/S1679-49742006000300006

29. Bazzoti A, Finokiet M, Conti IL, França MT, Waquil PD. Smoking and poverty in Brazil: an analysis of the profile of the smoking population based on the 2008-09 Brazilian government Family Budget Survey. Cien Saude Colet. 2016;21(1):45-52. https://doi.org/10.1590/1413-8123201521.16802014

30. Barros AJ, Cascaes AM, Wehrmeister FC, Martinez-Mesa J, Menezes AM. Tobacco smoking in Brazil: regional inequalities and prevalence according to occupational characteristics [Article in Portuguese]. Cien Saude Colet. 2011;16(9):3707-16. https://doi.org/10.1590/S1413-8123201100100008

31. Departamento de Estudos Socioeconômicos Rurais-DESER [homepage on the Internet]. Curitiba: DESER; [updated 2003 Dec 19; cited 2018 Aug 19]. Cadeia produtiva do fumo. Revista Contexto Rural no. 4. Available from: http://www.deser.org.br/pub_read.asp?id=85

32. Brasil. Ministério da Saúde. Instituto Nacional de Câncer. Inquérito domiciliar sobre comportamentos de risco e morbidade referida de doenças e agravos não transmissíveis: Brasil, 15 capitais e Distrito Federal, 2002-2003. Rio de Janeiro: INCA; 2004.

33. Brasil. Ministério do Planejamento, Orçamento e Gestão. Instituto Brasileiro de Geografia e Estatística (IBGE) [homepage on the Internet]. Rio de Janeiro: IBGE [cited 2018 Nov 7]. Pesquisa Nacional por Amostra de Domicílios 2008. Available from: http://www.ibge.gov.br

34. Guimarães VV, Florindo AA, Stopa SR, César CLG, Barros MBA, Carandina L, et al. Alcohol abuse and dependence in adults in the State of São Paulo, Brazil [Article in Portuguese]. Rev Bras Epidemiol. 2010;13(2):314-25. https://doi.org/10.1590/S1415-790X2010000200013

35. Strine TW, Okoro CA, Chapman DP, Barrilz LS, Ford ES, Ajani UA, et al. Health-related quality of life and health risk behaviors among smokers. Am J Prev Med. 2005;28(2):182-7. https://doi.org/10.1016/j.amepre.2004.10.002

36. Piasecki TM, Jahng S, Wood PK, Robertson BM, Epler AJ, Cronk NJ, et al. The subjective effects of alcohol-tobacco co-use: an ecological momentary assessment investigation. J Abnorm Psychol. 2011;120(3):557-71. https://doi.org/10.1037/a0023033

37. Kozlowski LT, Henningfield JE, Keenan RM, Lee H, Leigh G, Jelinek LC, et al. Patterns of alcohol, cigarette, and caffeine and other drug use in two drug abusing populations. J Subst Abuse Treat. 1993;10(2):171-9. https://doi.org/10.1016/0740-5472(93)90044-Z

38. WHO ASSIST Working Group. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. Addiction. 2002;97(9):1183-94. https://doi.org/10.1046/j.1360-0443.2002.00185.x

39. Koltermann AP, Koltermann ITAP, Tomasi E, Horta BL. Estresse ocupacional em trabalhadores bancários: prevalência e fatores associados. Saúde (Santa Maria). 2011;37(2):33-47. https://doi.org/10.5902/223658342856

40. Costa FD, Teo CRPA, Almeida JS. Stress vulnerability and feeding: a study in the work context [Article in Portuguese]. Sci Med. 2015;25(2):ID20372. https://doi.org/10.15449/1980-8108.2015.2.20372