Clinical characteristics and quality of life of smokers at a referral center for smoking cessation*

Características clínicas e qualidade de vida de fumantes em um centro de referência de abordagem e tratamento do tabagismo

Márcia Regina Pizzo de Castro, Tiemi Matsuo, Sandra Odebrecht Vargas Nunes

Abstract

Objective: To compare smokers and never smokers in terms of the following: quality of life; BMI; hospitalizations; functionality; family history of mental disorder; tobacco-related diseases; depression; and psychoactive substance use. **Methods:** We evaluated 167 smokers enrolled in a smoking cessation program at the Londrina State University Referral Center for Understanding and Treating Smoking, together with 272 never-smoking blood donors. We employed the following instruments, all validated for use in Brazil: a structured questionnaire for the collection of sociodemographic data; the Alcohol, Smoking and Substance Involvement Screening Test; the World Health Organization Quality of Life Instrument, brief version (WHOQoL-BREF); and the Fagerström Test for Nicotine Dependence. We also applied diagnostic criteria for the investigation of depressive disorders. **Results:** The mean age of the smokers and never smokers was, respectively, 45 and 44 years. Females predominated in both groups. Smokers more often presented with impaired work/domestic functionality, hospitalizations, depressive disorders, smoking in the household, sedative use and a family history of mental disorders, as well as scoring lower in all domains of the WHOQoL-BREF. The mean age at smoking onset was lower for smokers with depression or using psychoactive substances than for smokers without such comorbidities. Diabetes, arterial hypertension, heart disease, respiratory disease and peptic ulcer were more common in smokers than in never smokers. The mean BMI was lower in the smokers than in the never smokers. **Conclusions:** This study suggests that, for smoking cessation programs, subgroups of smokers with specific characteristics (early age at smoking onset, tobacco-related diseases, depressive disorders and use of psychoactive substances) should be identified.

Keywords: Smoking; Depressive disorder; Smoking cessation; Tobacco use disorder.

Resumo

Objetivo: Comparar, entre fumantes e nunca fumantes, os seguintes aspectos: qualidade de vida, IMC, hospitalizações, incapacidades, história familiar de transtorno mental, doenças relacionadas ao uso de tabaco, depressão e uso de substâncias psicoativas. **Métodos:** Um total de 167 fumantes inscritos em um programa de cessação do tabagismo no Centro de Referência de Abordagem e Tratamento do Tabagismo da Universidade Estadual de Londrina e 272 nunca fumantes doadores de sangue foram incluídos no estudo. Foram utilizados um questionário estruturado para a coleta de dados sociodemográficos, *Alcohol, Smoking and Substance Involvement Screening Test*, *World Health Organization Quality of Life Instrument, brief version* (WHOQoL-BREF) e *Fagerström Test for Nicotine Dependence*, todos validados para uso no Brasil, assim como critérios diagnósticos para a pesquisa de transtornos depressivos. **Resultados:** A média de idade para fumantes e nunca fumantes foi, respectivamente, de 45 e 44 anos. As mulheres predominaram nos dois grupos. Fumantes mais frequentemente apresentaram incapacidades laborais e domésticas, presença de fumantes em casa, hospitalizações, transtorno depressivo, uso de sedativos, história de transtorno mental na família e piores escores em todos os domínios do WHOQoL-BREF. A média de idade do início do tabagismo em fumantes com depressão ou em uso de substâncias psicoativas foi mais baixa do que os sem essas comorbidades. Fumantes apresentaram mais frequentemente diabetes, hipertensão arterial, doenças cardíacas, doenças respiratórias e úlcera péptica do que os que nunca fumaram. O IMC médio foi menor entre fumantes do que nos que nunca fumaram. **Conclusões:** Este estudo sugere que, no tratamento do tabagismo, deveriam ser identificados subgrupos de fumantes com características específicas: início precoce do tabagismo, doenças que sofrem agravos pelo tabaco, depressão e uso de substâncias psicoativas.

Descritores: Tabagismo; Transtorno depressivo; Abandono do uso de tabaco; Transtorno por uso de tabaco.

---

* Study carried out at Londrina State University, Londrina, Brazil.
Correspondence to: Márcia Regina Pizzo de Castro. Universidade Estadual de Londrina, Rua Ernani Lacerda de Athayde, 45, apto. 301, CEP 86061-610, Londrina, PR, Brasil.
Tel 55 43 3336-8058. Fax 55 43 3323-8210. E-mail: mpizzo@sercomtel.com.br
Financial support: This study received financial support from the Paraná State Araucária Foundation.
Submitted: 8 March 2009. Accepted, after review: 15 October 2009.

Introduction

Tobacco dependence predisposes to incapacitating conditions and diseases, thereby leading to high morbidity and mortality, as well as negatively affecting the health and quality of life (QoL) of the general population.[1-3]

There has been an increase in the number of studies evaluating the QoL of smokers, and all of those studies have reported that the QoL of nonsmokers is better than is that of smokers.[2,3]

According to the guidelines for smoking cessation, smokers submitted to clinical evaluation upon admission to a smoking cessation program, regardless of their health status (healthy, with smoking-related diseases or with other comorbidities), should have the goal of improving their health and QoL.[4]

According to Lemos,[5] half of all of psychiatric patients smoke, and only 15% of these are able to quit smoking, compared with approximately 50% of the smokers in the general population, of which smokers account for only one quarter. Patients with mental disorders seem to be more susceptible to nicotine dependence because nicotine has a positive influence on mood and cognition.

Smoking cessation treatment should take into consideration the clinical context, the severity of nicotine dependence, the age at onset of the smoking habit, comorbidities, family history and the motivation to quit smoking, as well as conditioning, together with the situations and feelings related to smoking.[6]

The purpose of the present study was to compare smokers and never smokers in terms of sociodemographic and clinical characteristics, as well as QoL.

Methods

This was a cross-sectional study, conducted between January of 2006 and March of 2008. The study included 167 smokers who sought treatment (with the intention of being treated for one year) at the Londrina State University Referral Center for Understanding and Treating Smoking, operating out of the Outpatient Clinic of the Londrina State University *Hospital de Clínicas*, and 272 never smokers who voluntarily sought the Londrina University Hospital Blood Bank in order to donate blood.

The inclusion criteria for both groups were as follows: being between 18 and 65 years of age; and having given written informed consent. The exclusion criteria for both groups were as follows: presenting with delusions; presenting with dementia; presenting with amnesia; and presenting with other cognitive disorders.

The study was approved by the Londrina State University Research Ethics Committee.

The data were collected using a structured questionnaire.

The QoL was evaluated using the World Health Organization Quality of Life Instrument, brief version (WHOQoL-BREF), adapted and validated for use in Brazil.[7]

We applied the Alcohol, Smoking and Substance Involvement Screening Test, a questionnaire for the screening of individuals who use psychoactive substances (including tobacco, alcohol, cannabinoids, cocaine, amphetamine-type stimulants, sedatives, hallucinogens, inhalants and opioids).[8,9]

The diagnosis of depression was established in accordance with the Classification of Mental and Behavioral Disorders of the tenth revision of the International Classification of Diseases.[10]

The Fagerström Test for Nicotine Dependence (FTND), used in order to detect nicotine dependence among smokers, has been translated to Portuguese and adapted for use in Brazil.[11] The FTND is a scale composed of six items and is scored from 0 to 10. The scores for nicotine dependence allow nicotine dependence to be classified by level: very low (0-2 points); low (3-4 points); moderate (5 points); high (6-7 points); and very high (8-10 points).[12] A score higher than 6 indicates that the patient is likely to experience significant discomfort (withdrawal syndrome) upon quitting smoking.[4] The FTND cut-off point for nicotine dependence was 5.[13]

For all subjects, we determined the BMI, which is calculated by dividing weight by height in square meters (kg/m^2).

In order to analyze the data, we used mean ± SD for the variables with normal distribution and median (interquartile range) for the variables with non-normal distribution. We also used raw frequency and percentage. The associations between sociodemographic variables, clinical variables and smoking-history variables were analyzed using the chi-square test or Fisher's

Table 1 - Sociodemographic characteristics, occurrence of impaired functionality and incidence of mental disorders in the families of smokers and never smokers in the sample.

Characteristics	Smokers (n = 167)	Never smokers (n = 272)	Statistical result (p)
Age, years[a]	45.7 ± 9.8	44.3 ± 9.7	1.97* (0.164)
Male gender, n (%)	65 (38.9)	112 (41.2)	0.22** (0.640)
Schooling in years, mean ± SD	11.2 ± 4.5	11.1 ± 5.2	0.21* (0.834)
Impaired work functionality, n (%)	21 (12.6)	10 (3.7)	12.48** (< 0.001)
Impaired domestic functionality, n (%)	27 (16.2)	12 (4.4)	17.67** (< 0.001)
Mental disorder in the family, n (%)	80 (47.9)	67 (24.6)	25.16** (< 0.001)
Smoking in the household, n (%)	78 (46.7)	44 (16.4)	47.10** (< 0.001)

*Student's t-test. **chi-square test.

exact test, as needed, and the Student's t-test. The QoL scores were analyzed using the Mann-Whitney U test and the Student's t-test. The Student's t-test was applied when the variables presented normal distribution and homogeneity of variances; otherwise, the Mann-Whitney test was applied. For all analyses performed, the level of significance was set at 5% ($p < 0.05$). The statistical power of the tests performed to evaluate QoL, functionality and depression was at least 90%.

Results

The mean age of the smokers was 45 years, and the mean age of the never smokers was 44 years (Table 1). More females than males sought smoking cessation treatment (61.1% vs. 38.9%, respectively). No differences were observed between smokers and never smokers in terms of age, gender, marital status, level of education or ethnicity. However, significant differences were observed between smokers and never smokers in terms of work capacity, ability to perform activities of daily living, family history of mental disorders and smoking in the household.

Table 2 demonstrates the values obtained in the four domains of the WHOQoL-BREF. Mean scores for smokers were significantly lower than were those for never smokers in the four domains of the WHOQoL-BREF—physical, psychological, social relations and environment.

Smokers and never smokers were also compared in terms of depression and psychoactive substance use (Table 3). Of the 167 smokers, 36 (21.6%) presented with moderate depression, 25 (15.0%) presented with mild depression and 21 (12.6%) presented with severe depression. Depression and sedative use were significantly more common in smokers than in never smokers. No significant differences were observed between smokers and never smokers in terms of alcohol consumption, marijuana consumption, cocaine consumption or inhalant consumption. None of the subjects in either group were using amphetamine-type stimulants, hallucinogens or opioids.

Table 4 presents the data regarding the smoking habits of smokers without depression who were not using psychoactive substances other than tobacco, as well as those of smokers without depression who were using such

Table 2 - Quality of life of smokers and never smokers in the sample.

Domain[a]	Smokers[b] (n = 167)	Never smokers[b] (n = 272)	Statistical result (p)
Physical	45.7 ± 9.8	44.3 ± 9.7	1.97* (0.164)
Psychological	14.21 ± 3.11	16.34 ± 1.78	57.52** (< 0.001)
Social relations	14.75 ± 3.32	16.05 ± 2.16	15.77** (< 0.001)
Environment	13.80 ± 2.20	14.44 ± 1.87	8.53** (0.004)
Total	12.96 ± 3.25	16.60 ± 2.21	13.97 (< 0.001)

[a]Domains of the World Health Organization Quality of Life Instrument, brief version. [b]Results expressed in mean ± SD. *Student's t-test. **Mann-Whitney U test.

Table 3 - Depression and use of psychoactive substances in smokers and never smokers in the sample.

Clinical context	Smokers (n = 167)		Never smokers (n = 272)		Statistical analysis
	n	%	n	%	
Depression					
Mild	25	15.0	9	3.3	73.39*
Moderate	36	21.6	14	5.1	
Severe	21	12.6	10	3.7	p < 0.0001
Absent	85	50.9	239	87.9	
Use of substances					
Alcohol	5	3.0	1	0.4	p = 0.2147**
Cannabinoids	2	1.2	-	-	p = 0.1503**
Cocaine	1	0.6	-	-	p = 0.3884**
Inhalants	1	0.6	-	-	p = 0.3884**
Sedatives	5	3.0	-	-	p = 0.0085**

*chi-square test (degrees of freedom = 1). **Fisher's exact test.

substances, smokers with depression who were not using such substances and smokers with depression who were using such substances. The mean age at smoking onset was lower for smokers with depression, using or not using other psychoactive substances, than for smokers without depression and not using such substances. No significant differences were observed between these two groups of smokers in terms of the number of cigarettes/day, the severity of nicotine dependence according to the FTND and smoking cessation.

Table 5 shows the presence of tobacco-related diseases, the occurrence of hospitalizations in the last month and the BMI. Hospitalization in the last month, diabetes, arterial hypertension,

Table 4 - Smoking habits of smokers without depression and not using psychoactive substances and of smokers with depression or using psychoactive substances (or a combination of the two) in the sample.

Smoking habit	Smokers without depression and not using psychoactive substances (n = 84)		Smokers with depression or using other psychoactive substances (or both) (n = 83)		Statistical analysis
Age, in years, at smoking onset, mean ± SD	16.35 ± 4.52		14.76 ± 4.09		2.379* p = 0.0185
Cigarettes/day	n	%	n	%	
> 20	49	58.3	53	63.9	0.5355**
≤ 20	35	41.7	30	36.1	p = 0.4643
FTND score					
≤ 5	39	46.4	33	39.8	0.7572**
≥ 5	45	53.6	50	60.2	p = 0.3842
Mean ± SD	5.86 ± 2.18		6.04 ± 2.29		0.5172* p = 0.6057
Attempts to quit smoking, n	n	%	n	%	
1-3	42	50.0	41	49.4	p = 0.4918***
> 3	20	23.8	25	30.1	
Attempted to quit but was unable to	22	26.2	16	19.3	
Never attempted to quit	-	-	1	1.2	

FTND: Fagerström Test for Nicotine Dependence. [a]Results expressed in mean ± SD. *Student's t-test. **chi-square test (degrees of freedom = 1). ***Fisher's exact test.

Table 5 - Clinical characteristics, hospitalization in the last month and BMI of smokers and never smokers in the sample.

Clinical context	Smokers (n = 167)	Never smokers (n = 272)	Statistical result (p)
Hospitalization in the last month, n (%)	28 (16.8)	13 (4.8)	17.56* (< 0.001)
Diabetes, n (%)	17 (10.2)	4 (1.5)	17.23* (< 0.001)
Hypertension, n (%)	38 (22.8)	35 (12.9)	7.30* (0.007)
Heart disease, n (%)	29 (17.4)	9 (3.3)	25.86* (< 0.001)
Cancer, n (%)	4 (2.4)	4 (1.5)	(0.486)**
Respiratory disease, n (%)	52 (31.1)	19 (7.0)	44.52* (< 0.001)
Peptic ulcer, n (%)	95 (56.9)	77 (28.3)	35.46* (< 0.001)
BMI, kg/m^2, median (interquartile range)	24.7 (16.9-43.6)	26.5 (17.2-47.5)	16.79*** (< 0.001)

*chi-square test (degrees of freedom = 1). **Fisher's exact test. ***Mann-Whitney U test.

heart disease, respiratory disease and peptic ulcer were more common among smokers than among never smokers. The BMI values were lower among the smokers than among the never smokers.

Discussion

Among the smokers who sought smoking cessation treatment at the Londrina State University Referral Center for Understanding and Treating Smoking, there was a predominance of females, and the mean age at treatment initiation was 45 years, findings that are similar to those previously reported.[14] The predominance of females in smoking cessation programs has been attributed to the fact that females receive more medical counseling and more often believe that smoking causes cancer.[4]

In the present study, the QoL of smokers was worse than was that of never smokers, and impaired functionality was more common in smokers than in never smokers. These results are consistent with those of another study, in which the QoL of was shown to be worse in individuals who were nicotine-dependent than in those who were not, the former group also presenting a higher incidence of impaired functionality.[1]

We found that impaired work/domestic functionality was more common in smokers than in never smokers. These data are similar to those obtained in previous studies, in which cigarette consumption was associated with premature death from chronic disease, economic losses for society and substantial overload of health care systems.[15]

In the present study, the mean scores in the four domains of the WHOQoL-BREF (physical, psychological, social relations and environment) were lower in smokers than in never smokers. These results are consistent with those obtained by another author,[3] who evaluated the association between QoL and the severity of tobacco dependence and reported an association between the severity of tobacco dependence and lower scores in all WHOQoL-BREF domains.

In the present study, we observed a positive relationship between smoking and mental disorders in the family. Family studies into the consumption of psychoactive substances and the smoking habit have revealed that genetic factors influence both disorders.[16] Females with a maternal and family history of psychoactive substance abuse might be influenced by genetic and environmental factors for psychoactive substance dependence, and familial patterns of substance abuse and of mental diseases should be clearly and consistently identified among such females.[17]

In the present study, there was a significant difference between smokers and never smokers in terms of smoking in the household. Genetic and environmental contributions are significant determinants of initiation and maintenance of the habit, and genetic factors are responsible for up to 56% of initiation risk and 67% of dependence maintenance.[18]

In the present study, the mean age at smoking onset in smokers with depression or using psychoactive substances (or a combination of the two) was 14 years, lower than the 16 years found for smokers who did not use psychoactive substances or suffer from depression. In other studies, the mean age at smoking onset was 15 years, similar to that observed in the present study.[13,14] Various studies have

reported that early age at smoking onset is a predictor of depression. According to one group of authors,[19] the early onset of regular smoking is a predictor of lifetime drug consumption and of lifetime depressive disorders, as is alcohol consumption. Another group of authors[20] showed that early-onset depression can increase the vulnerability to smoking in adolescents and that depressive disorders at the age of 14 years are positively associated with the use of dependence-producing substances, in both genders.

In the present study, depression was more common among smokers than among never smokers, a finding that is consistent with those obtained by another group of authors,[21] who demonstrated that various dysphoric symptoms, as well as vegetative/melancholic symptoms, were more prevalent and more severe in smokers who had difficulty in quitting than in patients with no history of nicotine dependence. Another group of authors[1] reported that smokers are more likely to present symptoms of depression and anxiety than are never smokers. According to the self-medication model of smoking, nicotine has mood-altering effects that are especially strong in individuals with depression, who are prone to experiences of negative affect. Smoking can have positive effects on cognition, mood and anxiety.[22] Recurrent episodes of depression that is more severe, as well as the level of depression immediately before smoking cessation, seem to be predictive of relapse. Therefore, smokers with depression should be evaluated in terms of the intensity of the depressive symptoms before and during the intervention in order to identify those who are at a higher risk for relapse.[4]

In the present study, the results of the Alcohol, Smoking and Substance Involvement Screening Test revealed a significant difference between smokers and never smokers only in terms of the use of sedatives. No significant differences were observed between smokers and never smokers regarding the use of alcohol and illicit drugs. These results are inconsistent with those of another study, in which it was suggested that alcohol consumption is strongly associated with smoking. Daily smokers with alcohol-related disorders presented worse symptoms related to alcoholism than did never smokers with the same disorders.[23]

In the present study, there were no significant differences, in terms of the number of cigarettes consumed per day, between smokers who used psychoactive substances other than tobacco or presented with depression (or a combination of the two) and smokers who did not use psychoactive substances or present with depression. One group of authors,[24] however, showed that smokers with fewer depressive symptoms smoked less than one pack of cigarettes per week, whereas those with many depressive symptoms smoked more than two packs of cigarettes per week.

We found that smokers who did not use psychoactive substances or present with depression had a mean score of 5.86 on the FTND, whereas smokers who used psychoactive substances or presented with depression (or a combination of the two) had a mean FTND score of 6.04, which is indicative of a high level of nicotine dependence (score ≥ 6). A score higher than 6 indicates that the patient will likely experience significant discomfort (withdrawal syndrome) when quitting smoking.[4] The FTND was initially developed to determine the nicotine replacement therapy for the treatment of withdrawal syndrome.[12] The FTND proved to be clinically useful in subgroups of smokers because greater physical dependence might lead to relapse.[25]

In the present study, there were no significant differences, in terms of the number of attempts at smoking cessation, in function of the use of psychoactive substances or of depression, which is in disagreement with the findings of another group of researchers,[26] who reported that depression that is more severe, anxiety disorders and disorders related to the use of psychoactive substances were associated with higher rates of smoking and lower rates of attempts at smoking cessation in comparison with those observed among individuals who never suffered from mental diseases. The same group of authors stated that depression that is more severe increases the risk of the post-cessation daily urge to smoke, as well as the risk of progression to nicotine dependence. According to yet another group of authors,[4] smoking cessation and the incidence of withdrawal syndrome in individuals with other types of dependence are similar to those observed in the general population. Patients who have mental disorders and are alcohol-dependent should receive the smoking

cessation treatment that is recommended for the general population.

We found that the number of hospitalizations in the last month and the incidence of diseases typically associated with smoking, such as diabetes, hypertension, heart disease, respiratory disease and peptic ulcer, were higher among smokers. Smoking has been reported as being a risk factor for peptic ulcer, diabetes mellitus, cardiovascular diseases, asthma, COPD, lung cancer and other types of cancer.[4] Tobacco, in all of its forms, increases the risk of premature death and of having physical limitations caused by coronary diseases, arterial hypertension, stroke, bronchitis, emphysema and cancer.[27]

Smoking has also been reported as being responsible for at least 80% of all deaths from COPD or cardiovascular disease, for at least 80% of premature deaths and for approximately 30% of all deaths from cancer.[15] The present study, however, detected no significant differences between smokers and never smokers regarding the incidence of cancer. This is explained by the young age of the study participants, the mean age of smokers and never smokers being, respectively, 45 and 44 years, females predominating (61.1%). Lung cancer is the neoplasia that currently has the highest mortality rate, and the incidence of lung cancer is higher among people in the 50-70 year age bracket; in addition, lung cancer is more prevalent among males.[28] In these cases, smoking is the principal risk factor.[28] In another study of lung cancer, males predominated, and the mean age of the patients was 63.7 years.[29]

In the present study, the mean BMI of smokers was lower than was that of never smokers. One group of authors,[30] studying smokers and nonsmokers, also reported the BMI to be lower among the smokers. Corroborating these findings, another group of authors[4] reported that smokers generally weigh less do than nonsmokers and that the former gain weight when they quit smoking.

The present study allowed us to gain a deeper understanding of the theme and might serve as the basis for new research aiming at improving the treatment of this clientele. Therefore, the specific recommendations for subgroups of smokers should be taken into consideration during smoking cessation programs.

The present study has certain limitations related to the lack of cooperation of smokers and never smokers regarding data collection because the study sample was a convenience sample. In addition, because the present study was a cross-sectional study, we were unable to interpret the causal influence.

We observed the need for devising smoking cessation intervention strategies in order to identify specific subgroups of adult smokers who started smoking at an early age and present with tobacco-related disorders, depressive disorders, sedative use and a high level of tobacco dependence. Smoking cessation programs for patients with depressive disorders or using psychoactive substances (or a combination of the two) should be the same as those recommended for the general population.

Further studies involving groups of smokers with tobacco-related diseases and a group of smokers without such diseases should be carried out in order to evaluate the frequency of hospitalization and of impaired work/domestic functionality, among other factors.

Smoking prevention programs should focus on the benefits of not smoking, in order to maintain health, improve the QoL and reduce the morbidity and impaired functionality resulting from tobacco consumption, as well as to reduce public health spending.

References

1. Schmitz N, Kruse J, Kugler J. Disabilities, quality of life, and mental disorders associated with smoking and nicotine dependence. Am J Psychiatry. 2003;160(9):1670-6.
2. Mitra M, Chung MC, Wilber N, Klein Walker D. Smoking status and quality of life: a longitudinal study among adults with disabilities. Am J Prev Med. 2004;27(3):258-60.
3. Castro MG. Qualidade de vida e tabagismo [dissertation]. Porto Alegre: Pontifícia Universidade Católica do Rio Grande do Sul; 2005.
4. Sociedade Brasileira de Pneumologia e Tisiologia. Diretrizes da SBPT: diretrizes para cessação do tabagismo – 2008. J Bras Pneumol. 2008;34(10):845-80.
5. Lemos T. Tabagismo e comorbidades psiquiátricas. In: Gigliotti A, Presman S. Atualização no Tratamento do Tabagismo. Rio de Janeiro: ABP Saúde; 2006. p. 53-70.
6. Nunes SO, Vargas HO, Lanssoni MM, Castro MR, Nunes MV, Barbosa L, et al. Avaliação das características clínicas dos fumantes que buscaram tratamento em um Centro de Referência do Sistema Único de Saúde (SUS). Biosaúde (Londrina). 2006;8(1):3-24.
7. Fleck MP, Louzada S, Xavier M, Chachamovich E, Vieira G, Santos L, et al. Application of the Portuguese version

of the abbreviated instrument of quality life WHOQOL-bref". Rev Saude Publica. 2000;34(2):178-83.
8. WHO ASSIST Working Group. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. Addiction. 2002;97(9):1183-94.
9. World Health Organization [homepage on the Internet]. Geneva: World Health Organization [cited 2009 Jan 21]. The ASSIST project – Alcohol, Smoking and Substance Involvement Screening Test – ASSIST Questionnaire Version 3.0 (Portuguese) [Adobe Acrobat document, 2p.] Available from: http://www.who.int/substance_abuse/activities/assist_portuguese.pdf
10. Organização Mundial da Saúde. Classificação de transtornos mentais e de comportamento da CID-10: Critérios diagnósticos para pesquisa. Porto Alegre: Artes Médicas; 1998.
11. Carmo JT, Pueyo AA. A adaptação ao português do Fagerström test for nicotine dependence (FTND) para avaliar a dependência e tolerância à nicotina em fumantes brasileiros. Rev Bras Med. 2002;59(1/2):73-80.
12. Meneses-Gaya IC, Zuardi AW, Loureiro SR, Crippa JA. Psychometric properties of the Fagerström Test for Nicotine Dependence. J Bras Pneumol. 2009;35(1):73-82.
13. Storr CL, Reboussin BA, Anthony JC. The Fagerström test for nicotine dependence: a comparison of standard scoring and latent class analysis approaches. Drug Alcohol Depend. 2005;80(2):241-50.
14. Gonçalves MS. Perfil do fumante que procura apoio em um programa de cessação do tabagismo [dissertation]. São Paulo: Universidade Federal de São Paulo; 2003.
15. Centers for Disease Control and Prevention (CDC). Cigarette smoking among adults--United States, 2007. MMWR Morb Mortal Wkly Rep. 2008;57(45):1221-6. Erratum in: MMWR Morb Mortal Wkly Rep. 2008;57(47):1281.
16. Grucza RA, Bierut LJ. Co-occurring risk factors for alcohol dependence and habitual smoking: update on findings from the Collaborative Study on the Genetics of Alcoholism. Alcohol Res Health. 2006;29(3):172-8.
17. Simons L, Giorgio T. Characteristics of substance abusing men and women entering a drug treatment program. An exploration of sex differences. Addict Disor Their Treat. 2008;7(1):15-23.
18. Chatkin JM. The influence of genetics on nicotine dependence and the role of pharmacogenetics in treating the smoking habit. J Bras Pneumol. 2006;32(6):573-9.
19. Hanna EZ, Yi HY, Dufour MC, Whitmore CC. The relationship of early-onset regular smoking to alcohol use, depression, illicit drug use, and other risky behaviors during early adolescence: results from the youth supplement to the third national health and nutrition examination survey. J Subst Abuse. 2001;13(3):265-82.
20. Sihvola E, Rose RJ, Dick DM, Pulkkinen L, Marttunen M, Kaprio J. Early-onset depressive disorders predict the use of addictive substances in adolescence: a prospective study of adolescent Finnish twins. Addiction. 2008;103(12):2045-53.
21. Leventhal AM, Kahler CW, Ray LA, Zimmerman M. Refining the depression-nicotine dependence link: patterns of depressive symptoms in psychiatric outpatients with current, past, and no history of nicotine dependence. Addict Behav. 2009;34(3):297-303.
22. Hughes JR, Hatsukami DK, Mitchell JE, Dahlgren LA. Prevalence of smoking among psychiatric outpatients. Am J Psychiatry. 1986;143(8):993-7.
23. Morissette SB, Gulliver SB, Kamholz BW, Duade J, Farchione T, Devine E, et al. Differences between daily smokers, chippers, and nonsmokers with co-occurring anxiety and alcohol-use disorders. Addict Behav. 2008;33(11):1425-31.
24. Kenney BA, Holahan CJ. Depressive symptoms and cigarette smoking in a college sample. J Am Coll Health. 2008;56(4):409-14.
25. Fagerström KO. Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. Addict Behav. 1978;3(3-4):235-41.
26. Breslau N, Novak SP, Kessler RC. Psychiatric disorders and stages of smoking. Biol Psychiatry. 2004;55(1):69-76.
27. World Health Organization [homepage on the Internet]. Geneva: World Health Organization [cited 2009 Feb 24]. Building blocks for tobacco control: a handbook [Adobe Acrobat document, 30p.] Available from: http://www.who.int/tobacco/resources/publications/general/en/building_blocks_1.pdf
28. Barros JA, Valladares G, Faria AR, Fugita EM, Ruiz AP, Vianna AG, et al. Early diagnosis of lung cancer: the great challenge. Epidemiological variables, clinical variables, staging and treatment. J Bras Pneumol. 2006;32(3):221-7.
29. Sánchez PG, Vendrame GS, Madke GR, Pilla ES, Camargo Jde J, Andrade CF, et al. Lobectomy for treating bronchial carcinoma: analysis of comorbidities and their impact on postoperative morbidity and mortality. J Bras Pneumol. 2006;32(6):495-504.
30. Chiolero A, Jacot-Sadowski I, Faeh D, Paccaud F, Cornuz J. Association of cigarettes smoked daily with obesity in a general adult population. Obesity (Silver Spring). 2007;15(5):1311-8.

About the authors

Márcia Regina Pizzo de Castro
Nurse. Londrina State University, Londrina, Brazil.

Tiemi Matsuo
Associate Professor. Department of Statistics, Londrina State University, Londrina, Brazil.

Sandra Odebrecht Vargas Nunes
Adjunct Professor. Department of Clinical Medicine, Londrina State University, Londrina, Brazil.