Prevalence and socioeconomic factors associated with smoking in people living with HIV by sex, in Recife, Brazil

Prevalência e fatores socioeconômicos associados com o tabagismo em pessoas vivendo com o HIV por sexo em Recife, Brasil

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Abstract

Introduction: Smoking is the leading cause of preventable death in the world. The prevalence of smoking is higher in people infected with HIV than in the general population. Although it is biologically plausible that smoking increases the morbidity and mortality of people living with HIV/AIDS, few studies in developing countries have analyzed the determinants and consequences of smoking in HIV infected people. **Objective:** To estimate the prevalence of smoking and identify the socioeconomic factors associated with smoking and smoking cessation in patients with HIV by sex. **Methods:** A cross-sectional study was conducted with baseline data, obtained from an ongoing prospective cohort study of patients with HIV attending two referral centers in Recife, Northeast Region of Brazil, between July 2007 and October 2009. **Results:** The prevalence of current smoking was 28.9%. For both sexes, smoking was independently associated with heavy alcohol drinking and marijuana use. Among women, smoking was associated with living alone, not being married and illiteracy; and among men, being 40 years or older, low income and using crack. Compared with ex-smokers, current smokers were younger and more likely to be unmarried, heavy drinkers and marijuana users. **Conclusions:** It is important to incorporate smoking cessation interventions for the treatment of heavy alcohol drinkers and marijuana users with HIV/AIDS, which may increase life expectancy and quality of life, as smoking is related to risk of death, relapse of tuberculosis, and non communicable diseases.

Keywords: Smoking. HIV. Associated factors. Socioeconomic Factors. Prevalence. sex.

Resumo

Introdução: Tabagismo é a principal causa de morte evitável no mundo e a sua prevalência é maior em pessoas infectadas pelo HIV. Embora haja plausibilidade biológica no fato de o tabagismo aumentar a morbimortalidade de pessoas que vivem com HIV, poucos estudos em países em desenvolvimento têm analisado os determinantes e as conseqüências desse hábito nessa população. **Objetivos:** Estimar a prevalência de tabagismo e identificar os fatores associados com o tabagismo e com a cessação do tabagismo em infectados pelo HIV, por sexo. **Métodos:** Estudo seccional utilizando os dados de base de uma coorte prospectiva de pacientes com HIV atendidos em dois centros de referência em Recife, nordeste do Brasil, entre julho de 2007 e outubro de 2009. **Resultados:** A prevalência de tabagismo foi de 28,9%. Para ambos os sexos, o tabagismo esteve associado com alcoolismo e uso de maconha. Entre as mulheres, o tabagismo esteve associado com não ser casada, morar só, e não saber ler e escrever; e entre os homens esteve associado com idade ≥ 40 anos, baixa renda mensal e uso de crack. Comparado com os ex-fumantes, os fumantes eram mais jovens, não casados, bebiam mais e fumavam maconha. **Conclusão:** É importante incorporar intervenções para cessação do tabagismo no tratamento de usuários de maconha e alcoolistas com HIV/AIDS, o que pode aumentar a qualidade e expectativa de vida desses pacientes, uma vez que o tabagismo está relacionado com maior risco de morte, recidiva da tuberculose e também com doenças crônicas não infecciosas.

Palavras-chave: Tabagismo. HIV. Fatores associados. Fatores socioeconômicos. Prevalência. Sexo.

Introduction

Smoking is the main risk factor for preventable death in the world and there is evidence of its association with cancers, respiratory and cardiovascular diseases[1,2]. While smoking has decreased in many developed countries, it increased nearly 50% worldwide, between 1975 and 1996, mainly due to an increase in cigarette consumption in developing countries[3]. There are sex-specific biological and social differences in both males and females, and tobacco companies are investing heavily in low-income and middle-income countries, where most potential new female users live[4].

Brazil stands out as the largest exporter and the fourth largest producer of tobacco in the world and it is estimated that about one third of its adult population smokes, totaling about 200,000 deaths a year related to smoking[5]. In recent years, the Ministry of Health began to develop a broad and hard-hitting Tobacco Control Program, registering a decline in the prevalence of smoking in Brazil from 35% to 16%, between 1989 and 2006. In 2006 the prevalence of smoking among men was 20% and 13% among women in major cities in Brazil[3,6]. Nevertheless, smoking has increased in low-income and lower literacy populations[6], which also have the highest rates in the country for diseases such as HIV/AIDS[7].

Studies reporting the effects of tobacco on the acquisition of HIV infection and progression to AIDS show controversial results[8-11]. There are reports stating that smoking reduces by 40% the immune and virological response to antiretroviral therapies[9].

Although mortality from opportunistic diseases associated with HIV infection has declined after the widespread use of highly-active antiretroviral therapy (HAART)[12-15], mortality from diseases related to smoking, such as cardiovascular diseases, has increased in this population[16,17]. This evidence suggests the need for intervention to reduce smoking and other risk factors associated with cardiovascular mortality in patients

infected with HIV. Apart from the importance of smoking in relation to non-infectious diseases, smoking also appears as a significant risk factor for infectious diseases like tuberculosis, which is a major opportunistic infection and cause of death in HIV/AIDS patients.

In recent years there has been increasing interest in studies of the prevalence and factors associated with smoking in people living with HIV in developed countries[18-20]. Many authors have reported that smoking prevalence is much higher among people with HIV compared to the general population[9,10,18,19] with rates ranging from 45-74%[16,19]. There is evidence that smoking causes immunosuppression in the lungs, characterized by local suppression of CD4, CD8, TNF-αand IL-1b, which may predispose individuals to bacterial infection[21]. Ohta et al.[22] have described that a decrease in alveolar macrophages could be the cause of this suppression of the local inflammatory response and a predisposition to bacterial and viral infections.

Studies of smoking in patients with HIV/AIDS are still rare in developing countries, where both the HIV/AIDS epidemics and the burden of smoking are greater. The objective of the present study was to estimate the prevalence of smoking, the characteristics of tobacco use and identify the socioeconomic factors associated with smoking and smoking cessation in patients with HIV, exploring differences by sex. The results of this study may contribute to a better understanding of the interrelationship between socioeconomic conditions, smoking and sex in a particular situation of greater vulnerability to drug use. This may increase the scope of action for the control of morbidity and mortality of patients living with HIV.

Methods

Study Population, Recruitment, and Survey Methods

The study was carried out in Recife, a city in the Northeast Region of Brazil, with an estimated population of 1,561,659 inhabitants in 2009. This cross-sectional study was conducted between July 2007 and October 2009, with HIV/AIDS patients aged 18 years or more, attending two HIV/AIDS referral centers (Oswaldo Cruz University Hospital and Correia Picanço Hospital). These two hospitals are responsible for about 70% of health care for HIV positive individuals in the state of Pernambuco. All the patients who went to these two health services for regular consultation and/or hospitalization were invited to participate in the study. After signing an informed consent form, they were interviewed by trained professionals who used a questionnaire designed specifically for this research. Five participants were excluded from the study because they did not provide responses to items relating to smoking behavior.

The study involved two analyses: first, the prevalence of smoking was estimated and the profile of smoking behavior was described in HIV patients; second, data were analyzed as case-control to identify factors associated with smoking by sex.

Definition of Variables Used in Analyses

The dependent variable was smoking behavior, classified as: never smoked (those who have never smoked in their life); former smokers (those who were not smoking at the time of the study and had quit smoking at least six months before); and current smokers (those who were smokers at the time of the study or had quit smoking less than six months before). This classification of smoking behavior was similar to that used in previous studies with people living with HIV[23,24].

The independent variables, representing the factors potentially associated with smoking behavior, were classified as: demographic (age and ethnic group), socioeconomic (marital status, social network, income of head of household), length of time the individual has been aware of his/her HIV status, and lifestyle (use of illicit drugs: marijuana, cocaine and crack; and

alcohol drinking status, categorized into two levels: abstainer or light drinker, and heavy drinker).

The criterion adopted for the consumption of alcohol was based on the number of drinks per day, according to the definition of patterns of alcohol drinking accepted by the Centers for Disease Control and Prevention (CDC)[25]. Individuals were then classified as abstainers or light drinkers (non drinker or drink no more than 2 drinks per day for men and 1 drink per day for women), and heavy drinkers (drink more than 2 drinks per day for men and 1 drink per day for women).

The variable "monthly income of the head of the household" was classified according to the minimum wage (MW) in Brazil during the study period.

The additional analysis (for current smokers alone) considered the dependent variable to be cigarette consumption, categorized as: up to 10 cigarettes per day (half a pack) and more than 10 cigarettes per day (more than half a pack).

Data Analysis

The whole analysis (except for cigarette consumption) was stratified by sex. Multinomial analysis was used because of the interest in studying a single outcome - smoking behavior - with three levels: has never smoked, former smokers and current smokers. In a second multinomial analysis, the objective was to study the factors associated with being a current smoker, by comparing this group with that former smokers (who had quitted smoking). All variables which were associated with smoking behavior in the univariate analysis with a p value below 0.20 were included in the multinomial logistic regression. The variables whose association with at least one of the outcome levels was statistically significant ($p < 0.05$) remained in the final model. As the measure of association in the multinomial analysis, the RRR (Relative Risk Ratio) is similar to the OR from a statistical point of view, the tables presented here show the OR. The software used was Stata 9.0 (Stata-Corp LP, College Station, TX). The study was approved by the Research Ethics Committee of the Health Sciences Center at the Federal University of Pernambuco.

Results

The present study included 1,815 people living with HIV/AIDS, 62.3% being men. The mean age was 39.6 for both sexes, with a standard deviation of 9.6 years for men and 9.4 years for women. The average monthly income was R$ 648.00 (one minimum wage = R$ 350.00 or US$ 191.00 in 2008) and 11.1% were illiterate. The monthly income was higher for men compared with women ($p < 0.001$).

Table 1 shows characteristics of smoking behavior among people living with HIV/AIDS, according to sex. The prevalence of smoking in the study was 28.9%, and the distribution by sex showed a statistically significant difference ($p < 0.001$). Smoking for more than 10 years was more frequent among men (84.3%), than women (79.1%), $p = 0.045$, and the mean age for starting smoking was 16 years (range 6 - 47 years old) for both sexes. Most current smokers (53.5% men and 63.7% of women) reported smoking up to half a pack per day (equivalent to 10 cigarettes a day) and only 3.8% of all smokers and former smokers (37/966) started smoking after testing positive for HIV.

Association between smoking behavior and socio-demographic variables

The absolute and relative distribution of smoking behavior according to selected characteristics and the results of univariate multinomial analysis for men are shown in Table 2 and for women in Table 3.

Table 4 shows the final model of multinomial logistic regression of the factors associated with smoking, compared with non-smokers, in people living with HIV/AIDS, stratified according to sex. Among men, being a former smoker (rather than a non-smoker) was associated with age ≥ 40

Table 1 - Smoking habit characteristics among people living with HIV, according to sex, Recife, Brazil, 2009.
Tabela 1 *- Características do tabagismo entre pessoas que vivem com HIV de acordo com o sexo, Recife, Brasil, 2009.*

	Men		Women		p	Total	
	N	(%)	N	(%)		N	(%)
Smoking status							
Has never smoked	480	(42.5)	340	(49.6)		820	(45.2)
Former smokers	282	(25.0)	188	(27.5)		470	(25.9)
Current smokers	368	(32.5)	157	(22.9)		525	(28.9)
					p<0.001*		
Cigarette consumption (among current smokers)							
1 - 10 cigarettes (half a pack) per day	170	(53.5)	86	(63.7)		256	(56.5)
11 - 20 cigarettes (from half a pack to one pack) per day	110	(34.6)	35	(25.9)		145	(32.0)
> 20 cigarettes (> one pack) per day	38	(11.9)	14	(10.4)		52	(11.5)
					p=0,096**		
Started smoking after the HIV diagnosis							
Yes	23	(3.7)	14	(4.2)		37	(3.8)
No	607	(96.3)	322	(95.8)		929	(96.2)
					p=0.691*		
Length of time smoking (former and current smokers)							
≤ 10 years	97	(15.7)	68	(20.9)		165	(17.5)
> 10 years	521	(84.3)	257	(79.1)		778	(82.5)
					p=0.045*		
Average age when starting smoking	16.49		16.68			16.55	
					p=0.614***		
Average age when quitting smoking among former smokers	32.92		31.37			32.35	
					p=0.073***		
Average monthly income among current smokers (R$)	639.8		435.0			577.8	
					p<0.001***		

* Pearson's Chi-square test. / ** Teste qui-quadrado de Pearson.*
** Chi-square test for linear trend. / *** Teste qui-quadrado de tendência.*
*** Two-sample t-test. / **** Test T para diferença de médias entre duas amostra*

years (OR 2.45, 95% CI 1.72 – 3.50), marijuana use (OR 3.55, 95% CI 2.38 – 5.30) and being married (OR 0.63, 95% CI 0.43 – 0.91). Among women, being a former smoker (rather than a non-smoker) was associated with age ≥ 40 years (OR 2.71, 95% CI 1.84 – 3.99) and marijuana use (OR 3.91, 95% CI 2.21 – 6.91).

Compared with non-smokers, the current smoking behavior among men was associated with age ≥ 40 years (OR 1.56, 95% CI 1.11 – 2.20), heavy drinking (OR 3.68, 95% CI 2.61 – 5.17), marijuana use (OR 4.26, 95% CI 2.90 – 6.27), crack use (OR 4.11, 95% CI 1.72 – 9.86) and a monthly income of < 2MW (OR 2.13, 95% CI 1.42 – 3.19); Compared with non-smokers, current smoking behavior among women was associated with heavy drinking (OR 4.73, 95% CI 2.99 – 7.48), marijuana use (OR 6.69, 95% CI 3.79 – 11.7), being unmarried (OR 2.39, 95% CI 1.27 – 4.49), living alone or in a shelter (OR 2.23, 95% CI 1.17 – 4.22) and being illiterate (OR 2.01, 95% CI 1.17 – 3.45).

Additional Analysis

In an additional multinomial regression analysis (Table 5), the factors associated with being a current smoker were studied, compared with being a former smoker, which could be a proxy of smoking cessation. The variables associated with being a current smoker among men were: heavy drinking ($p < 0.001$), crack use ($p = 0.027$) and not being married ($p < 0.001$). The

Table 2 - Frequency distribution and univariate analysis of factors associated with smoking behavior in men living with HIV, Recife, Brazil, 2009.

***Tabela 2** - Distribuição da freqüência e análise univariada dos fatores associados com o tabagismo em homens que vivem com HIV, Recife, Brasil, 2009.*

	Smoking status			Former smokers		Current smokers	
	Has never smoked	Former smokers	Current smokers	Crude OR (CI)	*p*	Crude OR (CI)	*P*
	n (%)	n(%)	n(%)				
Age group (years)							
18 – 39	267(46.6)	111(19.4)	195(34.0)	1.0		1.0	
≥ 40	213(38.2)	171(30.7)	173(31.1)	1.93 (1.43-2.60)	<0.001	1.11 (0.84-1.46)	0.445
Total	480	282	368				
Ethnic group							
White	124(42.2)	82(27.9)	88(29.9)	1.0		1.0	
Not white	356(42.6)	200(23.9)	280(33.5)	0.85 (0.61-1.18)	0.330	1.11 (0.81-1.52)	0.522
Total	480	282	368				
Alcohol consumption							
None or light drinker	358(50.3)	197(27.6)	157(22.1)	1.0		1.0	
Heavy drinker	122(29.2)	85(20.3)	211(50.5)	1.26 (0.91-1.75)	0.157	3.94 (2.95-5.28)	<0.001
Total	480	282	368				
Marijuana use							
Never	407(54.7)	167(22.5)	170(22.8)	1.0		1.0	
Past or current use	73(19.0)	114(29.7)	197(51.3)	3.80 (2.69-5.37)	<0.001	6.46 (4.68-8.92)	<0.001
Total	480	281	367				
Cocaine use							
Never	453(45.5)	240(24.1)	303(30.4)	1.0		1.0	
Past or current use	27(20.3)	41(30.8)	65(48.9)	2.87 (1.72-4.77)	<0.001	3.59 (2.24-5.77)	<0.001
Total	480	281	368				
Crack use							
Never	473(45.4)	260(25.0)	309(29.6)	1.0		1.0	
Past or current use	7(8.0)	21(24.1)	59(67.9)	5.46 (2.29-13.0)	<0.001	12.9 (5.82-28.6)	<0.001
Total	480	281	368				
Marital status							
Married	107(42.8)	88(35.2)	55(22.0)	1.0		1.0	
Others*	373(42.4)	194(22.0)	313(35.6)	0.63 (0.45-0.88)	0.006	1.63 (1.14-2.33)	0.007
Total	480	282	368				
Social support							
Living with family	377(44.2)	217(25.4)	260(30.4)	1.0		1.0	
Living alone or in shelters	103(37.5)	64(23.2)	108(39.3)	1.08 (0.76-1.54)	0.671	1.52 (1.11-2.08)	0.008
Total	480	281	368				
Literacy							
Yes	438(42.0)	260(25.0)	344(33.0)	1.0		1.0	
No	41(48.8)	19(22.6)	24(28.6)	0.78 (0.44-1.37)	0.390	0.74 (0.44-1.25)	0.271
Total	479	279	368				
Monthly income (MW)							
≥ 2	118(48.7)	66(27.3)	58(24.0)	1.0		1.0	
< 2	294(41.5)	169(23.8)	246(34.7)	1.03 (0.72-1.47)	0.880	1.70 (1.19-2.43)	0.003
Total	412	235	304				
HIV positivity							
Less than 5 years ago	254(45.0)	136(24.0)	175(31.0)	1.0		1.0	
≥5 years ago	226(40.0)	146(25.8)	193(34.2)	1.21 (0.90-1.62)	0.211	1.24 (0.94-1.62)	0.122
Total	480	282	368				

* Single, divorced, separated and widower. / * *Solteiro, divorciado, separado e viúvo.*

Table 3 - Frequency distribution and univariate analysis of factors associated with smoking behavior in women living with HIV, Recife, Brazil, 2009.

Tabela 3 *- Distribuição da freqüência e análise univariada dos fatores associados com o tabagismo em mulheres que vivem com HIV, Recife, Brasil, 2009.*

	Smoking status			Former smokers		Current smokers	
	Has never smoked	Former smokers	Current smokers	Crude OR (CI)	*p*	Crude OR (CI)	*P*
	n (%)	n(%)	n(%)				
Age group (years)							
18 – 39	199(55.6)	71(19.8)	88(24.6)	1.0		1.0	
≥ 40	141(43.1)	117(35.8)	69(21.1)	2.32 (1.61-3.35)	<0.001	1.11 (0.75-1.62)	0.603
Total	340	188	157				
Ethnic group							
White	95(52.5)	47(26.0)	39(21.5)	1.0		1.0	
Not white	245(48.7)	140(27.8)	118(23.5)	1.15 (0.77-1.73)	0.487	1.17 (0.76-1.80)	0.469
Total	340	187	157				
Alcohol consumption							
None or light drinker	279(53.3)	163(31.2)	81(15.5)	1.0		1.0	
Heavy drinker	61(37.7)	25(15.4)	76(46.9)	0.70 (0.42-1.16)	0.168	4.29 (2.82-6.52)	<0.001
Total	340	188	157				
Marijuana use							
Never	315(55.3)	152(26.6)	103(18.1)	1.0		1.0	
Past or current use	25(21.7)	36(31.3)	54(47.0)	2.98 (1.73-5.15)	<0.001	6.60 (3.91-11.1)	<0.001
Total	340	188	157				
Cocaine use							
Never	332(50.9)	179(27.5)	141(21.6)	1.0		1.0	
Past or current use	8(25.0)	8(25.0)	16(50.0)	1.85 (0.68-5.02)	0.224	4.71 (1.97-11.2)	<0.001
Total	340	187	157				
Crack use							
Never	332(50.8)	182(27.8)	140(21.4)	1.0		1.0	
Past or current use	8(25.8)	6(19.4)	17(54.8)	1.37 (0.47-4.00)	0.567	5.04 (2.12-11.9)	<0.001
Total	340	188	157				
Marital status							
Married	78(60.9)	33(25.8)	17(13.3)	1.0		1.0	
Others*	262(47.0)	155(27.8)	140(25.1)	1.39 (0.89-2.19)	0.147	2.45 (1.39-4.30)	0.002
Total	340	188	157				
Social support							
Living with family	311(51.2)	166(27.3)	130(21.5)	1.0		1.0	
Living alone or in shelters	28(36.4)	22(28.5)	27(35.1)	1.47 (0.82-2.65)	0.198	2.31 (1.31-4.06)	0.004
Total	339	188	157				
Literacy							
Yes	288(51.2)	154(27.4)	121(21.4)	1.0		1.0	
No	50(42.7)	32(27.4)	35(29.9)	1.19 (0.74-1.94)	0.467	1.66 (1.03-2.69)	0.037
Total	338	186	156				
Monthly income (MW)							
≥ 2	47(61.0)	16(20.8)	14(18.2)	1.0		1.0	
< 2	248(48.5)	145(28.4)	118(23.1)	1.72 (0.94-3.14)	0.079	1.59 (0.84-3.01)	0.148
Total	295	161	132				
HIV positivity							
Less than 5 years ago	202(53.2)	91(23.9)	87(22.9)	1.0		1.0	
≥5 years ago	137(45.1)	97(31.9)	70(23.0)	1.57 (1.09-2.25)	0.013	1.19 (0.81-1.74)	0.381
Total	339	188	157				

* Single, divorced, separated and widower. / ** Solteira, divorciada, separada e viúva.*

Table 4 - Multinomial logistic regression analysis of the association between smoking behavior and characteristics of individuals living with HIV/AIDS, Recife, Brazil, 2009.
***Tabela 4** - Análise de regressão logística multinomial da associação entre tabagismo e características do indivíduo com HIV/AIDS, Recife, Brasil, 2009.*

	Men				Women			
	Former smokers*		Current smokers*		Former smokers*		Current smokers*	
	OR (CI)	*P*	OR (CI)	*p*	OR (CI)	*p*	OR (CI)	*p*
Age group (years)								
18 - 39	1.0		1.0		1.0		1.0	
≥ 40	2.45(1.72-3.50)	<0.001	1.56(1.11-2.20)	0.010	2.71(1.84–3.99)	<0.001	1.35(0.87–2.09)	0.181
Alcohol consumption								
None or light drinker	1.0		1.0		1.0		1.0	
Heavy drinker	1.33(0.92-1.93)	0.132	3.68(2.61-5.17)	<0.001	0.72(0.42 –1.22)	0.218	4.73(2.99–7.48)	<0.001
Marijuana use								
Never	1.0		1.0		1.0		1.0	
Past or current use	3.55(2.38-5.30)	<0.001	4.26(2.90-6.27)	<0.001	3.91(2.21–6.91)	<0.001	6.69(3.79–11.7)	<0.001
Crack use								
Never	1.0		1.0					
Past or current use	2.54 (0.99-6.52)	0.051	4.11(1.72-9.86)	0.001				
Monthly income (MW)								
≥ 2	1.0		1.0					
< 2	1.42(0.96–2.08)	0.076	2.13(1.42-3.19)	<0.001				
Marital status								
Married	1.0		1.0		1.0		1.0	
Others**	0.63(0.43-0.91)	0.016	1.39(0.91-2.14)	0.127	1.20(0.74–1.93)	0.448	2.39(1.27–4.49)	0.007
Social support								
Living with family					1.0		1.0	
Living alone or in shelters					1.20(0.64- 2.25)	0.563	2.23(1.17- 4.22)	0.014
Literacy								
Yes					1.0		1.0	
No					1.15 (0.69-1.89)	0.587	2.01 (1.17-3.45)	0.011

* "Has never smoked" was the base outcome. / ** Nunca fumou foi a categoria de referência.*
** Single, divorced, separated and widower. / *** Solteiro, divorciado, separado e viúvo*

variables associated with being a current smoker among women were: being younger (age < 40 years; p = 0.023), heavy drinking (p < 0.001) and marijuana use (p = 0.035).

Additionally, the association between the number of cigarettes smoked per day (cigarette consumption, categorized as: up to 10 and more than 10 cigarettes) and socio-demographic variables and lifestyle habits was analyzed. Only being male and younger (18 to 39 years) were associated with smoking more than 10 cigarettes per day (p = 0.015) (data not shown).

Discussion

The overall prevalence of smoking found in this population was 28.9%. Most of smokers smoked at least 1 – 10 cigarettes (half a pack) per day and had smoked for over 10 years. The prevalence of smoking found in this population was lower than that found in most studies for individuals with HIV/AIDS in Europe and North America[10,16,18-20,26]. The prevalence of smoking was higher (p <0.001) among men (32.6%) than women (22.9%). Additionally,

Table 5 - Multinomial multivariate regression analysis of the association between current smokers and former smokers and characteristics of individuals living with HIV/AIDS, Recife, Brazil, 2009.
Tabela 5 *- Análise de regressão logística multinomial da associação entre tabagismo – comparado com ex-tabagismo – e características do indivíduo com HIV/AIDS, Recife, Brasil, 2009.*

	Men		Women	
	Current Smoker vs Former Smoker*		Current Smoker vs Former Smoker*	
	OR (CI)	*p*	OR (CI)	*P*
Age group (years)				
18 – 39	1.0		1.0	
≥ 40	0.72 (0.52 – 1.01)	0.055	0.58 (0.37 – 0.93)	0.023
Alcohol consumption				
None or light drinker	1.0		1.0	
Heavy drinker	2.88 (2.06 – 4.03)	<0.001	5.75 (3.38 – 9.77)	<0.001
Marijuana use				
Never	1.0		1.0	
Past or current use	1.26 (0.88 – 1.79)	0.197	1.77 (1.04 – 3.03)	0.035
Crack use				
Never	1.0			
Past or current use	1.92 (1.08 – 3.44)	0.027		
Marital status				
Married	1.0			
Others**	2.11 (1.41 – 3.15)	<0.001		

* Former Smoker as the base outcome. / ** Ex-fumante foi a categoria de referência.*
Single, divorced, separated and widower. / * Solteiro, divorciado, separado e viúvo.*

these rates are higher than those found in the general population aged over 15 years and living in Recife (17.4%), the city covered by this study[27].

It is worth pointing out that the mean age found for starting smoking was 16 years for both sexes. Only 3.8% started smoking after learning of their HIV-positive status, suggesting that, in general, smoking precedes infection.

Factors associated with current smoking when compared with not smoking, for both sexes were those related to habits such as heavy alcohol consumption and drug use. The association of heavy consumption of alcohol[28,29] and illicit drug use[29-31] with smoking in patients infected by HIV has been widely reported in the literature.

Although this association is also found in the general population[16], the context of the HIV/AIDS population deserves special attention. The concomitant use of these substances leads to the interaction of their individual effects on CD4 T cell count, leading to a decline in this count and progression to AIDS, as described in relation to the use of alcohol, crack and cocaine[32,33].

The literature does not report a significant association between marijuana use and progression to AIDS or changes in the effects of antiretroviral therapy[34], and its use is related to the improvement of various symptoms such as nausea and depression[35]. Nevertheless, it must be stressed that marijuana may cause memory and attention disturbances that can have an effect on adherence to treatment[36,37] and in the present study, marijuana use was associated with smoking.

Factors associated with current smoking for men exclusively, compared with non-smoking, were age ≥40 years, crack use and low monthly income. On the other hand, factors indicating lack of social support - not

being married, living alone or in shelters and illiteracy - were associated with current smoking among women exclusively. Women had a lower income than men in the study population, a fact that can increase women's vulnerability to lack of social support.

Several studies have shown a strong association between low socioeconomic status and smoking[38-40] and this was also found in the present study. In the final model, monthly family income below two minimum wages remained associated with smoking among HIV-positive men, emphasizing the impoverishment of smoking among people living with HIV. This is worrying, since, in addition to the greater impairment of individuals' health on the biological level, much of their meager income is used for the purchase of cigarettes, rather than the investing in healthier food, education and health.

The strong association between lack of social support and smoking among women with HIV/AIDS also deserves attention. Strategies specifically addressing smoking cessation in HIV-positive women should be strongly encouraged, because antiretroviral therapy is not as beneficial in smokers in this group as it is in non-smokers, after adjustment for social variables[41], as shown by Feldman *et al*.

Knowledge of factors associated with current smoking is important, having former smokers as the comparison group, since studies suggest that this behavioral change is more difficult to achieve in people living with HIV/AIDS because they have higher levels of nicotine dependence when compared to a similar non-HIV population[42]. This analysis showed that heavy alcohol drinking, crack use and not being married were characteristics associated with current smoking for men; and being younger, heavy alcohol drinking and marijuana use were characteristics associated with current smoking for women. Despite the Ministry of Health's guidelines for smoking cessation recognizing the association of AIDS with smoking and other addictions[43] and cessation being reported to be less effective in patients with HIV compared to the general population[44], there is no indication of specific interventions for people living with HIV/AIDS.

The international literature has often found higher prevalence of smoking among young individuals[26], although, in the present study, the prevalence of current smoking was similar in both age groups. However, when the analysis was performed to study cigarette consumption in current smokers exclusively, young adults (18 to 39 years) were found to smoke more than 10 cigarettes per day, which points to the need for intervention by the Brazilian tobacco control program to specifically address this sector of the HIV/AIDS population.

One limitation of this study was not having included the Fagerström test in the questionnaire to assess the degree of dependence on smoking. Moreover, this is a cross-sectional study with consequent limitations of temporality of associations. Nevertheless, the present results reinforce the importance of smoking control programs specifically aimed at people with HIV/AIDS.

Smoking has been associated with several AIDS-related diseases, such as pulmonary infections, oral diseases and malignancies. Furthermore, smoking has been associated with tuberculosis in people infected with HIV[45], and tuberculosis is the main cause of death among people living with HIV/AIDS in developing countries including Brazil. Savès et al.[46], using the Anderson equation to estimate the Relative Risk for coronary heart disease in the HIV-infected population, reported that this risk was higher for smokers in both sexes, with smoking attributable risks being 65% and 29% for men and women, respectively. Moreover, cessation of smoking is more likely to reduce cardiovascular risk than the choice of antiretroviral therapy for HIV-infected persons[47].

Conclusions

In Brazil, most counseling programs

and guidelines for action addressing HIV patients have excellent approaches for drug usage but do not include interventions relating to smoking cessation. Interventions regarding smoking cessation for people living with HIV/AIDS are justified by the high prevalence of smoking, its biological effects on antiretroviral therapy and its association with adverse treatment events. As the population living with HIV/AIDS seems to be more vulnerable to tobacco use, the incorporation of smoking cessation interventions in their treatment – especially addressing heavy alcohol drinkers and marijuana users – may increase the life expectancy and quality of life, although smoking cessation programs should take into account the specificities of this population, if they are to be successful.

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