Original Article

Prevalence of and variables related to smoking among medical students at a university in the city of Passo Fundo, Brazil*

Prevalência e fatores associados ao tabagismo em estudantes de medicina de uma universidade em Passo Fundo (RS)

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Abstract

Objective: To determine the prevalence of and factors associated with smoking among medical students, as well as to evaluate the profile of this group. **Methods:** A total of 316 medical students (98.7% of the total) at the University of Passo Fundo, in the city of Passo Fundo, Brazil, completed a self-report questionnaire with questions on tobacco intake and on attitudes related to smoking. In accordance with the World Health Organization guidelines, the students were classified as daily smokers, occasional smokers, former smokers or nonsmokers, those in the two first categories being considered active smokers. **Results:** We found that 16.5% of the students were active smokers (daily smokers, 5.4%; occasional smokers, 11.1%) and that 3.5% were former smokers. The mean age was 22.2 ± 2.4 years. Factors significantly associated with the smoking habit (p < 0.05) were male gender, paternal smoking, regular alcohol consumption and use of antidepressants or anxiolytics. For the majority (69.2%) of the smokers, the age at smoking onset was 15-19 years of age, and the main motivations to start smoking were self-initiative and influence of friends. The conceptualization of smoking as an illness was significantly higher among the nonsmokers. In 70.6% of the smokers, tobacco intake was 1-10 cigarettes a day. Among the smokers, 92.3% agreed that smoking is harmful to health, 67.3% had tried to quit smoking, 96.0% believed themselves able to do so, and 87.2% intended to quit smoking. **Conclusions:** The prevalence of smoking remains significant among medical students. Therefore, it is fundamental that we develop more effective strategies for smoking prevention and cessation in order to reduce the number of smokers among future doctors.

Keywords: Smoking; Prevalence; Students, medical; Behavior.

Resumo

Objetivo: Verificar a prevalência e fatores associados ao tabagismo entre os acadêmicos de medicina e avaliar o perfil desse grupo. **Métodos:** Responderam a um questionário autoaplicável, contendo perguntas sobre consumo e atitudes relacionadas ao tabagismo, 316 acadêmicos de medicina (98,7% do total) da Universidade de Passo Fundo. Segundo recomendações da Organização Mundial da Saúde, os estudantes foram classificados em fumantes diários, fumantes ocasionais, ex-fumantes ou não-fumantes, sendo considerados fumantes ativos os nas duas primeiras categorias. **Resultados:** Observou-se que 16,5% dos acadêmicos eram fumantes ativos (5,4% diários e 11,1% ocasionais) e 3,5% eram ex-fumantes. A média de idade foi 22,2 ± 2,4 anos. Os fatores significativamente associados ao tabagismo (p < 0,05) foram sexo masculino, pai fumante, uso regular de bebidas alcoólicas e uso de antidepressivos ou ansiolíticos. Verificou-se que 69,2% dos fumantes iniciaram o tabagismo entre 15 e 19 anos, tendo como principais motivações a vontade própria e/ou a influência de amigos. A conceituação do tabagismo como doença foi significativamente maior entre os não-fumantes. Quanto à carga tabágica, 70,6% dos fumantes consumiam 1-10 cigarros por dia. Entre os fumantes, 67,3% já tentaram parar de fumar, 96,0% acreditam serem capazes de fazê-lo e 87,2% pretendem deixar de fumar, ao passo que 92,3% admitiram que o cigarro faz mal à saúde. **Conclusões:** A prevalência do tabagismo ainda é significativa entre os acadêmicos de medicina, sendo fundamental estabelecer estratégias preventivas e de cessação mais efetivas a fim de se tentar reduzir o número de fumantes entre os futuros médicos.

Descritores: Tabagismo; Prevalência; Estudantes de medicina; Comportamento.

Introduction

Worldwide, smoking is considered the leading avoidable cause of death,[1,2] especially death due to cancer, lung disease and cardiovascular disease, as well as being a risk factor for other diseases.[3] The World Health Organization (WHO) estimates that smokers account for one third of the world adult population, that is, 1.2 billion people.[1]

According to the WHO, the total annual number of tobacco-related deaths is 5 million. If the current tendency toward an expansion of the tobacco epidemic is maintained, in 2030, this number will increase to 10 million, and 70% of these deaths will occur in developing countries.[1,4]

In this era of prevention and health promotion, the health-related behavior of health professionals has drawn considerable attention and has been a common object of study.[5] Since physicians serve as role models for their patients and for the general population, as well as playing a key advisory role in smoking prevention and cessation, they constitute a primary target of the anti-smoking campaign recommended by the WHO.[2]

It might seem paradoxical that, despite the large amount of information about the hazardous effects of smoking received during medical school, tobacco use continues to be common among medical students.[6]

In a review of the literature, in which studies on the prevalence of smoking among medical students published in the past 30 years were analyzed, significant variations were found among countries, with prevalence rates ranging from 3% in the USA to 58% in Japan.[6] Studies conducted in Brazil have revealed a tendency toward a decrease in the prevalence of smoking among medical students.[7,8]

Although tobacco use among medical students has decreased in the past 50 years, it continues to be a worrisome disease due to the role that these future physicians will play in the community. Smokers are unlikely to be convinced to quit smoking if their advisor, the physician, is a smoker.[9,10]

The objective of the present study was to determine the prevalence of smoking among medical students at the *Universidade de Passo Fundo* (UPF, University of Passo Fundo), to analyze factors associated with smoking and to study the profile of these smokers.

Methods

A cross-sectional study involving medical students at the UPF was carried out in 2007. After the objective of the study had been briefly explained and written informed consent had been obtained, the researchers administered questionnaires in the classrooms. There was no personal identification on the questionnaires, which were collected separately and were not attached to the informed consent forms. The researchers remained in the classrooms during the completion of the questionnaires in order to answer any questions that might arise. The sixth-year students were visited during their medical internship activities in the hospital so that they could complete the questionnaire.

The questionnaires, developed specifically for the present study, contained questions about biological data, demographic data, current residence, parental marital status, parental smoking, alcohol consumption, physical exercises, diagnosis of depression, use of antidepressants/anxiolytics, academic performance, passive smoking and conceptualization of smoking, as well as questions related to addressing the topic of smoking during medical appointments with patients.

In accordance with the WHO guidelines,[11] the students were categorized as daily smokers, occasional smokers, former smokers or nonsmokers. Daily smokers were defined as those who smoked at least one cigarette per day for at least one month before completing the questionnaire; occasional smokers were defined as those who did not smoke daily; former smokers were defined as those who, after having been smokers, had quit smoking at least one month prior; and nonsmokers were defined as those who had never smoked or who had been smoking for less than one month.

The participants who were categorized as current smokers (daily smokers and occasional smokers) also completed the second part of the questionnaire, which included data on the type of cigarette smoked, age at smoking onset, reasons to start smoking, family attitude toward smoking, time to the first cigarette after waking, number of cigarettes smoked per day and conceptualization of smoking as a disease.

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Table 1 – Characteristics of the population studied, correlating medical school year with gender, age and number of current smokers.

Medical school year	n	%	Gender, n (%)		Age, years		Current smokers[a]	
			Male	Female	Mean ± SD	Median	n	%
First	54	17.1	23 (42.6)	31 (57.4)	20.23 ± 2.42	20	7	13.5
Second	53	16.8	24 (45.3)	29 (54.7)	20.75 ± 1.82	21	13	24.5
Third	55	17.4	22 (40.0)	33 (60.0)	21.91 ± 1.90	22	9	16.7
Fourth	54	17.1	22 (40.7)	32 (59.3)	22.87 ± 2.05	23	13	25.0
Fifth	53	16.8	28 (52.8)	25 (47.2)	23.72 ± 1.64	24	4	8.5
Sixth	47	14.9	28 (59.6)	19 (40.4)	24.47 ± 1.41	24	6	12.8
Total	316	100.0	147 (46.5)	169 (53.5)	22.28 ± 2.42	22	52	100.0

[a]Daily smokers + occasional smokers.

The questionnaires were reviewed and entered into a database constructed using the program Statistical Package for the Social Sciences, version 15.0 (SPSS Inc., Chicago, IL, USA), which was used to perform the statistical analysis. The chi-square test was used to evaluate associations among the variables, considering a confidence interval of 95% (p < 0.05).

The study project was approved by the UPF Research Ethics Committee.

Results

Of the 320 students enrolled in the UPF School of Medicine in 2007, 316 (98.75%) completed the questionnaire. Of those 316, 147 (46.5%) were male and 169 (53.5%) were female. The mean age was 22.28 ± 2.42 years (Table 1). A total of 97.8% of the participants described themselves as White.

We found that 16.5% of the students were smokers, 5.4% being daily smokers and 11.1% being occasional smokers, and that 3.5% were former smokers (Table 2).

Factors significantly associated with the smoking habit were male gender, paternal smoking, regular alcohol consumption and use of antidepressants or anxiolytics. The conceptualization of smoking as a disease was significantly higher among the nonsmokers (Table 3).

Commercial cigarettes were used by 98.2% of the current smokers. For the majority (69.2%) of the smokers, the age at smoking onset was 15-19 years of age, and the principal reasons to start smoking were personal choice and peer pressure. In 70.6% of the smokers, tobacco intake was 1-10 cigarettes per day, and 41.1% smoked their first cigarette within the first hour after waking (Table 4).

Among the smokers, 92.3% acknowledged that smoking is harmful to health, 67.3% had tried to quit smoking, 96.0% believed themselves able to quit smoking, and 87.2% intended to quit smoking.

When the students were asked whether they avoided environments where there were people smoking, 76.3% of the nonsmokers stated that they did, compared with only 36.4% of the former smokers (p = 0.007).

There were no significant differences among the different medical school years in terms of the frequency of smokers.

Discussion

The prevalence of smoking found at the UPF School of Medicine (16.5%) was found to be lower than that in the Brazilian population (22.4%),[12] which is in accordance with the literature. In the present study, the prevalence

Table 2 – Categorization of the interviewees by gender.

Gender	Daily smoker		Occasional smoker		Former smoker		Nonsmoker		Current smoker[a]	
	n	%	n	%	n	%	n	%	n	%
Male	10	58.8	24	68.6	7	63.6	106	41.9	34	65.4
Female	7	41.2	11	31.4	4	36.4	147	58.1	18	34.6
Total[b]	17	5.4	35	11.1	11	3.5	253	80.1	52	16.5

[a]Daily smokers + occasional smokers. [b]% calculated in relation to the total number of interviewees.

Table 3 – Personal factors that might or might not be associated with the smoking habit, with the conceptualization of smoking and with whether or not the subject is addressed during medical appointments.

Variable	Current smokers[a]		Nonsmokers		p
	n	%	n	%	
Gender					
Male	34	65.4	106	41.9	0.002
Female	18	34.6	147	58.1	
Currently lives with					
Alone or with friends	31	59.6	120	47.4	0.109
Parents, relatives or spouse	21	40.4	133	52.6	
Parental marital status[b]					
Married	42	80.8	216	85.7	0.365
Separated/divorced	10	19.2	36	14.3	
Maternal smoking					
Smoker	8	15.4	21	8.3	0.113
Nonsmoker or former smoker	44	84.6	232	91.7	
Paternal smoking					
Smoker	12	23.1	22	8.7	0.003
Nonsmoker or former smoker	40	76.9	231	91.3	
Regular alcohol consumption[c]					
Yes	15	28.8	35	13.8	0.008
No	37	71.2	218	86.2	
Regular physical activities[c]					
Yes	20	38.5	96	37.9	0.944
No	32	61.5	157	62.1	
Psychiatric disorder (anxiety/depression)					
Yes	17	32.7	56	22.1	0.104
No	35	67.3	197	77.9	
Use of antidepressants/anxiolytics					
Yes	29	55.8	78	30.8	0.001
No	23	44.2	175	69.2	
Academic performance[d]					
Good (excellent or good)	33	63.5	190	75.1	0.085
Poor (fair, poor or very poor)	19	36.5	63	24.9	
Conceptualization of smoking					
Disease	17	32.7	141	55.7	0.002
Other[e]	35	67.3	112	44.3	
Addresses the topic of smoking during appointments					
Yes	47	90.4	229	90.5	0.977
No	5	9.6	24	9.5	

Former smokers (n = 11) were excluded from this analysis. [a]Daily smokers + occasional smokers. [b]Unknown in one case. [c]Two or more times a week. [d]Response to the question "How would you rate your academic performance?" [e]Interviewees were allowed to select more than one response. Current smokers: choice (55.8%); lifestyle (3.8%); tranquilizing effect (9.6%); and nonsmokers: choice (37.2%); lifestyle (2.8%); passing fancy (5.1%); tranquilizing effect (2.8%).

of smoking at the UPF was found to be higher that the rates reported in similar studies carried out at other medical schools in Brazil: 14% at the University of Brasília in 2003[13]; 5.6% at the University of São Paulo in 1996[7]; and 10.1% at the University of Pelotas in 2002.[8]

An important confounding factor among the studies is the definition of smoking. In most studies, the subjects are categorized as smokers or nonsmokers, whereas others include the category of occasional tobacco use.[6,14] The Centers for Disease Control and Prevention and the WHO define (young) current smokers as individuals who smoked for at least one day in the past 30 days,[15] therefore including occasional smokers in this category. In a popu-

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Table 4 – Characteristics of the medical students who
were smokers.

Variable	Current smokers (daily + occasional)	
	n	%
Age at smoking onset		
6 to 9 years	1	1.9
10 to 14 years	14	26.9
15 to 19 years	36	69.2
20 to 24 years	1	1.9
Number of cigarettes smoked per day[a]		
1 to 5	5	29.4
6 to 10	7	41.2
11 to 15	3	17.6
16 to 20	2	11.8
Time to first cigarette after waking?[a]		
Less than 30 min	4	23.5
30 to 60 min	3	17.6
1 to 2 h	2	11.8
More than 2 h	8	47.1
At smoking onset, had friends who smoke?		
Yes	49	94.2
No	3	5.8
Family attitude		
Unaware of the student's smoking	19	36.5
Indifferent	6	11.5
Unfavorable	27	51.9
Response to the question "Is smoking harmful to health?"		
Yes	48	92.3
No	4	7.7
Response to the question "Do you believe yourself able to quit smoking?"[b]		
Yes	49	96.0
No	2	4.0
Has already tried to quit smoking		
Yes	35	67.3
No	17	32.7
Intends to quit smoking[c]		
Yes	41	87.2
No	6	12.8
Reason to start smoking[d]		
Personal choice	36	69.2
Peer pressure	22	42.3
Passing fancy	9	17.3
Influence of parents	3	5.8
Influence of advertising	3	5.8
Other	3	5.8

[a]Valid only for daily smokers (n = 17). [b]Unknown in 1 case.
[c]Unknown in 5 cases. [d]Participants were allowed to select
more than one alternative.

lation-based study carried out in Brazil at two
different time points, only daily smokers were
considered smokers in 1989, whereas, in 2003,
occasional smokers were included in the cate-
gory "smokers".[12]

The importance of including occasional
smokers in the studies is due to the fact that,
whereas daily smokers should be the target of
measures directed at smoking cessation, young
occasional smokers should be the target of
preventive measures.[15] Occasional smoking also
constitutes a major risk factor for tobacco-re-
lated diseases, which is why occasional smokers
are included in the same category as daily
smokers.[16]

Although the prevalence of smoking was
lower among medical students than in the
general population, this finding should be inter-
preted with caution, due to the influence that
future physicians will have on the community.
Therefore, even a small number of smokers, in a
population that serves as a role model, can have
a negative effect on smoking control programs,
especially on strategies for prevention and
smoking cessation.

In addition, most studies involving the
general population,[12] as well as most of those
involving health professionals,[6,14] report that
tobacco consumption is more common in males.
Even though the prevalence of smoking has been
decreasing in men and increasing in women, it
remains significantly higher in males.[12]

The significant association between regular
alcohol consumption and smoking again
confirms what has been found in other groups
of medical students and in the general popula-
tion.[17] The greater, regular alcohol consumption
among smokers suggests that these individuals
are more likely to use drugs other than tobacco,
thereby increasing the smoking-related risks
considerably.

There is evidence of comorbidity between
smoking and depressive disorders, as well as of
an association between smoking and anxiety.[17]
In the present study, current or previous use of
antidepressants or anxiolytics was found to be
positively associated with smoking. However,
smoking was not found to present a similar
association with physician-diagnosed anxiety
or depression. Since these variables were self-
reported by the students, and no specific
questionnaire was used to evaluate their psycho-

logical profile, such diseases might have been underdiagnosed in this population.

The age at smoking onset was found to be higher among the medical students than in the general population. Studies have shown that individuals with higher level of education typically start smoking later (> 17 years of age).[18] This might reflect a difference in the availability of educational support regarding smoking in this population.

Personal choice was the principal reason given for starting smoking, followed by peer pressure, which was corroborated by the fact that, at smoking onset, 94.2% of the students had close friends who smoked. This shows that, in addition to personal choice, the influence of people with whom the youths most often interact is a determining factor for the development of the disease.

The conceptualization of smoking as a disease is well established in, and incorporated into, the body of medical knowledge.[2] Among medical students, who study and are exposed to the various smoking-related diseases, this conceptualization is expected to be consolidated. Our study showed that, among the smokers, only 32.7% considered smoking a disease, whereas the majority (55.8%) considered it a choice. The most surprising fact, however, is that, among the nonsmokers, only 55.7% considered smoking a disease. These numbers show that, regardless of whether or not students smoke, the concept of smoking as a disease remains poorly understood by most of them. This can influence the attitude of students and future physicians toward patients who smoke. Since these students and physicians view smoking only as a choice and do not consider such patients to be ill, they are less likely to approach the problem with the same propriety as that employed when attempting to treat and advise patients who have other diseases.

The percentage of nonsmoking students who avoided passive smoking (76.3%) can be considered low, since involuntary smoking is increasingly recognized as a cause of disease in nonsmokers.[3,19] Among the former smokers, only 36.4% reported avoiding passive exposure, showing that, even after smoking cessation, these students remain subject to the hazardous effects of smoking, albeit passively.

Although addressing the topic of smoking during medical appointments in the various fields of medicine is considered routine practice in the anamnesis, it requires that health professionals be adequately trained. Studies have shown that a brief intervention during medical appointments leads to cessation rates ranging from 5% to 10% in one year, whereas more intensive interventions, with behavioral counseling and drugs, result in cessation rates ranging from 20% to 25% in one year.[20] Among the students at the UPF, 90.5% reported addressing the subject during appointments with patients, which demonstrates the awareness of most students regarding the importance of this disease as a public health problem.

Many pioneering studies have been conducted and many important political decisions on smoking control have been made by physicians, professionals who enjoy a unique position of power and influence in the fight against smoking, principally because they know diseases in detail, they are respected in society and they are the principal advisors to patients on health-related subjects.[2,21]

Physicians should serve as role models in society, especially regarding the use of a drug that is widely disseminated in the population and is recognized as a major risk factor for numerous diseases.

In conclusion, the high prevalence of smokers among the medical students at the UPF shows the need for the implementation of a more effective smoking control program in this population. The higher frequency of occasional smokers suggests the need for promoting smoking prevention campaigns, since these students are likely to be less nicotine dependent due to their lower daily tobacco intake. Preventing this population from increasing their tobacco intake, which increases the risk of becoming more dependent and the risk of developing diseases, should be the primary target of such campaigns.

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