Original Article

Smoking among undergraduate health sciences students: prevalence and knowledge*

Tabagismo em universitários de ciências da saúde: prevalência e conhecimento

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Abstract

Objective: To determine the prevalence of smoking and the level of knowledge about smoking among undergraduate health sciences students. **Methods:** This was a cross-sectional study. A self-administered structured questionnaire was completed in the classroom by senior undergraduate health sciences students in the cities of Cuiabá and Várzea Grande, Brazil. We evaluated students at one public university and two private universities. Five variables were studied: age, gender, type of course, smoking status, and knowledge about smoking. The knowledge variable was divided into five parts: smoking as a disease; smoking/nicotine as a cause of dependence; specific education on smoking; major obstacles to the success of smoking cessation; and forms of smoking treatment. Only the medical students responded to questions related to the last two items. **Results:** The prevalence of smoking ranged from 9.3% at the public university to 21.1% at one of the two private universities. Approximately 30% of the respondents were unable to identify nicotine as the cause of dependence, 20.8% did not consider smoking a disease, and 47.2% reported that they had never received any instruction on the topic of smoking. The medical students enrolled at the public university showed the highest level of knowledge regarding the various forms of smoking treatment. **Conclusions:** The prevalence of smoking among the university students in our sample was high. Their knowledge about smoking was insufficient, which suggests inadequacy of the curricula at these universities.

Keywords: Smoking/epidemiology; Students; Questionnaires.

Resumo

Objetivo: Determinar a prevalência de tabagismo e o nível de conhecimento acerca do tabagismo entre estudantes universitários da área de saúde. **Métodos:** Estudo transversal. Um questionário estruturado e autoadministrado foi respondido em sala de aula por universitários do último ano dos cursos da saúde de Cuiabá e Várzea Grande (MT). Foram avaliados alunos de uma universidade pública e de duas universidades particulares. Cinco variáveis foram analisadas: idade, sexo, curso de graduação, status tabágico e noções sobre o tabagismo. A variável "conhecimento" foi dividida em cinco partes: tabagismo como doença; tabagismo e nicotina como causa de dependência; treinamento específico sobre tabagismo; fatores dificultadores da cessação tabágica; e formas de tratamento do tabagismo. Os últimos dois itens somente foram respondidos pelos alunos dos cursos de medicina. **Resultados:** A prevalência do tabagismo variou de 9,3% na universidade pública a 21,1% em uma das universidades particulares. Aproximadamente 30% dos entrevistados não souberam identificar a nicotina como causadora da dependência, 20,8% não consideravam o tabagismo como doença, e 47,2% responderam não terem recebido nenhum treinamento sobre o tabagismo. Os alunos de medicina da universidade pública mostraram maior conhecimento sobre as diversas formas de tratamento do tabagismo. **Conclusões:** A prevalência do tabagismo entre os universitários estudados foi alta. O conhecimento sobre tabagismo foi deficitário, o que poderia refletir uma inadequação da grade curricular dos cursos dessas universidades.

Descritores: Tabagismo/epidemiologia; Estudantes; Questionários.

Introduction

The prevalence of smoking among health care professionals is a cause for concern, because it is one of the factors that can reduce the effectiveness of smoking control. In addition to the fact that such professionals serve as role models for a healthy lifestyle, they have the greatest capacity and responsibility to combat this disease. As future health care professionals, undergraduate health sciences students who smoke should also take these facts into consideration and should overcome their nicotine dependence. There have been some studies of the prevalence of smoking among undergraduate health sciences students. One study of the prevalence of smoking among medical students in 2004 showed that 6.4% were regular smokers and 34.3% were former smokers.[1] A study of physicians in the Federal District of Brasília, Brazil, in 2007 reported that smokers accounted for 7.2% of the sample (5.9% being regular smokers and 1.3% being occasional smokers), whereas 70.1% were nonsmokers and 22.7% were former smokers.[2]

Knowledge about smoking on the part of health care professionals is an essential component of the fight against this endemic disease. The training of such professionals must address the following subjects: the epidemiology of smoking; the composition of tobacco, including its major toxic components; the process of chemical, physical, and psychological dependence; the obstacles to the success of smoking cessation; and the various forms of smoking cessation treatment. All of these aspects are key to providing good guidance and the necessary referrals to patients who smoke. Unfortunately, at most universities, the curricula do not meet those needs satisfactorily.[3,4]

It should be borne in mind that a multidisciplinary approach is needed in order to provide appropriate treatment for smokers. In addition, health care teams that work in programs of smoking prevention and treatment should have a high level of understanding and commitment.[5] However, a study of nursing students reported that 63.3% had not received formal instruction on the topic of smoking as part of their regular training. Although senior nursing students demonstrated some knowledge about smoking, it was insufficient for them to participate in effective tobacco control programs.[6]

In Brazil, few studies have sought to investigate the relationship that health care professionals have with smoking.[7,8] Therefore, we designed the present study in order to investigate certain variables that are considered basic to the training of undergraduate health sciences students, such variables including the recognition of smoking as a disease and of nicotine dependence, as well as the major obstacles to the success of smoking cessation and the various forms of smoking cessation treatment. In this context, the objective of the study was to determine the prevalence of smoking and the level of knowledge about smoking among undergraduate health sciences students, in order to determine whether or not these future health care professionals are well prepared to treat patients seeking smoking cessation treatment.

Methods

This was a cross-sectional study of undergraduate health sciences students in the cities of Cuiabá and Várzea Grande, both of which are located in the state of Mato Grosso, Brazil. In the area under study, there are three universities that offer courses in the health sciences, two in Cuiabá—the *Universidade Federal de Mato Grosso* (UFMT, Federal University of Mato Grosso) and the *Universidade de Cuiabá* (UNIC, University of Cuiabá)—and one in Várzea Grande—the Centro *Universitário de Várzea Grande* (UNIVAG, Várzea Grande University Center). Of the three, only UFMT is a public university. Only UFMT and UNIC offer undergraduate medical courses. At the time of the study, there were 948 senior undergraduate students duly enrolled in the aforementioned courses, and all were invited to participate in the study. Of those 948 students, 782 agreed to participate and completed a self-administered structured questionnaire.

The inclusion criteria were being a senior undergraduate student and being at least 18 years of age. The data collection process involved direct contact with the subjects. The instrument used for data collection was specifically designed for this study (self-administered questionnaire) and consisted of three parts: identification of the volunteer (demographic profile and field

of study); categorization of smoking status; and assessment of knowledge about smoking. Data were collected with the permission of the participating institutions and of the coordinators of each course, who scheduled the visits. Students were assured that their identities would be kept confidential.

On the basis of the data collected, five variables were studied: age; gender; field of study; smoking status; and knowledge about smoking. The smoking status variable consisted of three categories: smoker (defined as having a lifetime history of smoking at least 100 cigarettes and currently smoking on a regular basis); former smoker (defined as having quit smoking at least 6 months prior); and nonsmoker. The knowledge variable was divided into five parts: recognizing smoking as a disease; knowing that smoking is a cause of dependence and knowing the identity of the substance producing that dependence; having received specific instruction on the topic of smoking as part of an undergraduate course; being able to identify major obstacles to the success of smoking cessation; and being familiar with the various forms of smoking cessation treatment. Only the medical students were asked to answer the questions related to the last two items.

Data from the completed questionnaires were double entered into a Microsoft Excel 2003 database, after which they were imported into the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA). Because the data were nominal, descriptive analysis was performed. Pearson's chi-square test was used for estimating the correlation among the variables of interest, and the level of statistical significance was set at $p < 0.05$. The study was approved by the UNIC Research Ethics Committee (Process no. 003/CEP/UNIC/2008; Protocol no. 0307-183), in accordance with Brazilian National Health Council/Brazilian National Ethics Committee Resolution no. 196/96.

Table 1 – Prevalence of smoking at three universities in the cities of Cuiabá and Várzea Grande, Brazil, 2008.[a]

Smoking status	UFMT	UNIC	UNIVAG
Smoker	10 (9.3)*	67 (17.0)	59 (21.1)
Former smoker	10 (9.3)	45 (11.4)	34 (12.2)
Nonsmoker	87 (81.3)	284 (71.7)	186 (66.7)
Total	107 (100)	396 (100)	279 (100)

UFMT: *Universidade Federal de Mato Grosso* (Federal University of Mato Grosso), UNIC: *Universidade de Cuiabá* (University of Cuiabá); and UNIVAG *Centro Universitário de Várzea Grande* (Várzea Grande University Center). [a]Values expressed as n (%). *p < 0.05.

Results

Of the 948 senior undergraduate health sciences students, 782 (80.8%) completed the questionnaire. Among the 166 (17.5%) who did not complete the questionnaire, the most common reasons were declining to participate and being absent on the day the instrument was administered. The mean age of the respondents was 25 ± 6 years, and 594 (76%) were female. The mean prevalence of smoking, by university, ranged from 9.3%, at UFMT, to 21.1%, at UNIVAG (Table 1). The highest rates of smoking were found among pharmacy and dentistry students (29.6% and 25.5%, respectively).

Table 2 – Distribution of undergraduate student affirmative responses regarding knowledge about smoking, by field of study, at three universities in the cities of Cuiabá and Várzea Grande, Brazil, 2008.

Field of study	Total number of students	Variable		
		Dependence[a]	Nicotine[b]	Instruction[c]
		n (%)	n (%)	n (%)
Medicine[d]	72	72 (100)	52 (72.2)	45 (62.5)
Physical Education	97	94 (97.9)*	77 (79.4)	39 (40.2)*
Nursing	201	194 (96.5)*	150 (74.6)*	106 (52.7)*
Pharmacy	98	97 (99.0)*	87 (88.8)*	66 (67.3)
Physical Therapy	104	103 (99.0)*	82 (78.8)*	71 (68.3)
Nutrition	32	32 (100)	24 (75.0)	1 (2.9)*
Psychology	66	65 (98.5)	45 (68.2)	28 (42.4)*
Dentistry	112	108 (96.4)*	86 (76.8)*	57 (50.9)

[a]Smoking as a cause of dependence. [b]Nicotine as the dependence-producing substance in tobacco. [c]Received instruction on the topic of smoking as part of their undergraduate course. [d]Medicine as the baseline. *p < 0.05.

Table 3 – Frequency of undergraduate student responses to a question about the recognition of smoking as a disease, by field of study, at three universities in the cities of Cuiabá and Várzea Grande, Brazil, 2008.

Field of study	Total number of students	Is smoking a disease?	
		Yes n (%)	No n (%)
Medicine[a]	72	63 (87.5)	9 (12.5)
Physical Education	97	78 (80.4)	19 (19.6)
Nursing	201	157 (78.1)	44 (21.9)
Pharmacy	98	78 (79.6)	20 (20.4)
Physical Therapy	104	79 (76.0)	25 (24.0)
Nutrition	32	25 (78.1)	7 (21.8)
Dentistry	112	80 (71.4)	32 (28.6)
Psychology	66	39 (59.1)*	27 (40.9)

[a]Medicine as the baseline. *$p < 0.05$.

Most of the students had some knowledge about smoking dependence. However, when questioned about the dependence-producing substance, not all were able to identify it. Of the 72 medical students, only 52 (72.2%) identified nicotine as the cause of smoking dependence, compared with 87 (88.8%) of the 98 pharmacy students. As can be seen in Table 2, the highest proportions of affirmative responses to the question of whether participants had received specific instruction on the topic of smoking as part of their undergraduate course were among physical therapy students (68.3%) and pharmacy students (67.3%), whereas the lowest proportions were among nutrition students (2.9%) and physical education students (40.2%).

Table 4 – Major obstacles to the success of smoking cessation, as cited by undergraduate medical students at two universities in the city of Cuiabá, Brazil, 2008.[a]

Obstacle	UNIC	UFMT
Anxiety	41 (91.1)	26 (96.3)
Low motivation	29 (64.4)	22 (81.5)
Personality trait	22 (48.9)	24 (88.9)
Depression	30 (66.7)	27 (92.6)
Weight gain	24 (53.3)*	21 (77.8)*
Individual genetics	16 (35.6)	14 (51.9)
Degree of dependence	33 (73.3)*	26 (96.3)*
Duration of the smoking habit	30 (66.7)	23 (85.2)
Alcohol abuse	30 (66.7)	21 (77.8)

UNIC: *Universidade de Cuiabá* (University of Cuiabá); and UFMT: *Universidade Federal de Mato Grosso* (Federal University of Mato Grosso). [a]Values expressed as n (%). *$p < 0.05$.

Most of the students in our sample (79.2%) responded affirmatively to the question concerning the recognition of smoking as a disease (Table 3). In the analysis of this variable by the field of study, the highest proportions of affirmative responses were among medical students (87.5%) and physical education students (80.4%), whereas the lowest proportion was among psychology students (59.1%).

Tables 4 and 5 show data related to more specific knowledge possessed by the medical students enrolled at the two universities that offer undergraduate medical courses (UFMT and UNIC). When comparing those two institutions, we found that, regarding knowledge about major obstacles to the success of smoking cessation (Table 4), the UFMT students gave a greater number of correct responses than did the UNIC students, the obstacles most commonly mentioned being anxiety (96.3% vs. 91.1%), degree of dependence (96.3% vs. 73.3%), and depression (92.6% vs. 66.7%), whereas the least frequently mentioned obstacle was individual genetics (51.9% vs. 35.6%).

In addition, the comparison between UFMT, which is a public university, and UNIC, which is a private university, revealed that, regarding knowledge about the various forms of smoking cessation treatment (Table 5), the number of correct responses was greater among the UFMT students than among the UNIC students for nicotine replacement therapy (92.6% vs. 66.2%), use of bupropion (96.3% vs. 62.2%), and use of varenicline (22.2% vs. 11.1%), the only exception being for cognitive-behavioral therapy (66.7% vs. 73.3%).

Discussion

The overall prevalence of smoking among the students in our sample was 17.4%, the highest rates being found for UNIC students of dentistry and pharmacy (25.5% and 29.6%, respectively). In a previous study conducted only at UFMT but involving all students, the reported prevalence of smoking was 6.67%, lower than that found in the present study.[9] However, another study, conducted in the Federal District of Brasília, Brazil, reported the prevalence of smoking among university students to be 14.7%, similar to the 17.4% found in the present study.[10]

Considering the pressing need for health care professionals to work toward reducing the rates

Table 5 – Undergraduate medical student knowledge about the various forms of smoking cessation treatment, by university, at two universities in the city of Cuiabá, Brazil, 2008.[a]

Form of treatment	UNIC	UFMT
Cognitive-behavioral therapy	33 (73.3)	18 (66.7)
Nicotine replacement therapy	30 (66.7)*	25 (92.6)*
Bupropion	28 (62.2)*	26 (96.3)*
Varenicline	5 (11.1)	6 (22.2)
None listed	3 (6.7%)	0 (0.0)

UNIC: *Universidade de Cuiabá* (University of Cuiabá); and UFMT: *Universidade Federal de Mato Grosso* (Federal University of Mato Grosso). [a]Values expressed as n (%). *p < 0.05.

of smoking, together with the fact that such professionals should set an example for others in terms of promoting awareness of the harms of smoking, the smoking prevalence found in the present study is a cause for concern. To be able to promote smoking cessation with greater conviction, health care professionals, in addition to being aware of the harms of smoking, must quit smoking, thereby bridging the gap between speech and daily practice (i.e., practicing what they preach).[11]

In the present study, most of the respondents knew that nicotine is the dependence-producing substance in tobacco. However, it was not possible to measure the extent to which this piece of information is interrelated with other aspects of knowledge about smoking, because the instrument used here was designed to assess objective knowledge at a single point in time. For a more detailed analysis of the relationship between knowledge of the dependence-producing substance in tobacco and the information set required for the management of smokers, it would be necessary to use an instrument comprising questions that are subjective and practical.

One major difficulty of all smoking cessation programs is determining the degree of nicotine dependence, knowledge that is crucial for the successful and appropriate referral of patients. Withdrawal syndrome is directly related to the degree of nicotine dependence and is a major cause of relapse; it is therefore essential that the treatment of this syndrome be prioritized.[12]

The proportion of affirmative responses to the question concerning specific instruction on smoking as part of the undergraduate course was surprising, especially among the medical students. Only 62.5% of the medical students reported having received formal instruction on the topic of smoking as part of their training. Therefore, we must ask, "Is the topic of smoking being neglected in the medical curricula at the universities studied?"

A study of medical students conducted in Hong Kong showed that, although 93.1% of the students believed that knowledge about smoking was important, only 38.0% had received specific instruction on smoking cessation.[13] Other studies have reported this discrepancy between what should be taught to health sciences students and what is actually part of the curriculum. This shows that there is a need for changes in the curriculum guidelines so that smoking-related content becomes an integral part of the training of future health care professionals, as is instruction on diabetes, hypertension, tuberculosis, etc.[11,14]

The results for the question concerning the recognition of smoking as a disease were also surprising, because only 87.5% of the medical students classified smoking as a disease. We expected that all medical students would know this, because smoking has been considered a disease since the 1990s and now has its own code in the tenth revision of the International Classification of Diseases (F17.2). The problem here takes on different dimensions, because, to date, smoking has been better known as a cause of disease than as a nosological entity in itself. This dichotomy between risk factor and disease is a cause for concern in terms of reducing the prevalence of smoking. For instance, during a medical appointment, physicians are usually greatly concerned about talking with patients about increased cholesterol levels and often forget to provide them with appropriate counseling on smoking reduction/cessation, despite the fact that smoking alone is a greater risk factor for cardiovascular diseases than is a high cholesterol level.[15,16] Therefore, a routine medical appointment represents another opportunity to advise smokers on how to overcome their dependence.

The results of the analysis of other types of knowledge in the present study showed that, when asked about the major obstacles to the success of smoking cessation, the medical students most commonly cited anxiety and

the degree of dependence. Because they will be the ones responsible for prescribing (or not) the drugs that help patients deal with nicotine withdrawal symptoms, future physicians should be aware of the various physical reactions to smoking cessation.[17] Health care professionals should also be aware of other major obstacles to the success of smoking cessation, chief among which are low patient motivation,[18] patient personality, coexisting psychiatric disorders, and weight gain.[19,20]

Regarding the forms of smoking cessation treatment, most medical students mentioned bupropion therapy and nicotine replacement therapy, which are first-line treatments. The use of a new drug, varenicline, which is also a first-line drug, was hardly ever mentioned, probably because it was only recently introduced into the market.[12,21] Pharmacological treatment is an important ally in smoking cessation, because it relieves withdrawal syndrome symptoms, which constitute a major cause of relapse among smokers, especially among those with a high degree of nicotine dependence. In addition to having knowledge about the drugs that facilitate smoking cessation, it is important to have knowledge about psychological treatment, cognitive-behavioral therapy being the form of treatment most commonly indicated in the literature. This treatment modality was less frequently mentioned by medical students than were first-line drugs. It is known that cognitive-behavioral therapy can be used in isolation and that it produces better results when the degree of smoking dependence is lower. Smokers with a higher degree of dependence must be treated with bupropion and nicotine replacement therapy, which have been shown to increase the rate of smoking cessation success in such individuals.[22-24]

The medical students who participated in the present study were senior undergraduate students, most of whom were already receiving inpatient and outpatient clinical training. This particular characteristic of the study population represents a limitation of our study. Some of those students proved unwilling to interrupt their training to complete the questionnaire.

Finally, we suggest that universities offering health care courses include smoking-related themes in their curricula, because, in order to control smoking effectively, we need well-trained professionals who are able to cope with this endemic disease. The results of the present study allow us to conclude that our study population had insufficient knowledge about some of the topics analyzed (smoking as a disease, identity of the dependence-producing substance in tobacco, and the forms of smoking cessation treatment), which suggests inadequacy of the health sciences curricula at the three universities studied.

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